

Aiginger, Karl (Ed.); Kratena, Kurt (Ed.); Schratzenstaller, Margit (Ed.); Weiss, Teresa (Ed.)

Research Report

Moving towards a new growth model

WWWforEurope Deliverable, No. 3

Provided in Cooperation with:

WWWforEurope - WelfareWealthWork, Wien

Suggested Citation: Aiginger, Karl (Ed.); Kratena, Kurt (Ed.); Schratzenstaller, Margit (Ed.); Weiss, Teresa (Ed.) (2014) : Moving towards a new growth model, WWWforEurope Deliverable, No. 3, WWWforEurope, Vienna

This Version is available at:

<https://hdl.handle.net/10419/125620>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Moving towards a new growth model

**Editors: Karl Aiginger, Kurt Kratena, Margit Schratzenstaller,
Teresa Weiss (WIFO)**

April 2014



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 290647.

Editors: Karl Aiginger, Kurt Kratena, Margit Schratzenstaller, Teresa Weiss (WIFO)

Contributions by: David Bailey (ASTON), Kurt Bayer (WIFO), Frank Geels (Manchester University), Peter Huber (WIFO), Jürgen Janger (WIFO), Thomas Leoni (WIFO), Hans Pitlik (WIFO), Janneke Plantenga (Utrecht University), Andreas Sachs (ZEW), Thomas Sauer (FH Jena), Mark Sommer (WIFO), Gunther Tichy (WIFO), Jeroen van den Bergh (UAB)

Moving towards a new growth model

D602.1: “Conference report: Moving towards a new growth model – Analytical part”

Deliverable No. 3

This paper can be downloaded from www.foreurope.eu

Please respect that this report was produced by the named authors within the WWWforEurope project and has to be cited accordingly



THEME SSH.2011.1.2-1

*Socio-economic Sciences and Humanities Europe
moving towards a new path of economic growth
and social development - Collaborative project*

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 290647.

Contents

Editorial	1
1. The mission of WWForEurope - <i>First signals for transition and recent rebounds</i>	3
<i>Karl Aiginger (WIFO)</i>	3
1.1 Introduction and Outline	3
1.2 The goals of the project	3
1.3 What happened after the Financial Crisis	4
1.4 General policy reactions to rising disequilibria	7
1.5 Socio-economic transition and dynamics	7
1.5.1 Positive signals (sprouts of change)	8
1.5.2 Backlashes and rebound effects	9
1.6 Open questions and progress needed in research	10
2. Area Summaries	12
2.1 Summary of Area 1	
<i>Hans Pitlik (WIFO), Thomas Leoni (WIFO)</i>	12
2.1.1 Contribution to Central Question 1	14
2.1.2 Contribution to Central Question 2	16
2.1.3 Contribution to Central Question 3	18
2.1.4 Contribution to Central Question 4	18
2.1.5 Contribution to Central Question 5	20
2.1.6 Open questions, gaps, conflicts, trade-offs and synergies with other Areas	22
2.2 Summary of Area 2	
<i>Jeroen van den Bergh (UAB)</i>	24
2.2.1 Contribution to Central Question 1	26
2.2.2 Contribution to Central Question 2	29
2.2.3 Contribution to Central Question 3	30
2.2.4 Contribution to Central Question 4	32
2.2.5 Contribution to Central Question 5	34
2.2.6 Abstracts of relevant milestones and deliverables	35
2.3 Contribution of Area 3	
<i>David Bailey (ASTON), Jürgen Janger (WIFO)</i>	35
2.3.1 Contribution to Central Question 3	36

2.3.2	Contribution to other Central Questions	44
2.3.3	Open questions and further research topics	47
2.3.4	Abstracts of relevant milestones and deliverables	47
2.4	Contribution of Area 4 <i>Andreas Sachs (ZEW)</i>	47
2.4.1	Contribution to Central Question 1	49
2.4.2	Contribution to Central Question 2	51
2.4.3	Contribution to Central Question 3	52
2.4.4	Contribution to Central Question 4	52
2.4.5	Contribution to Central Question 5	54
2.4.6	Open questions and further research topics	54
2.5	Summary Area 5 <i>Thomas Sauer (FH Jena), Peter Huber (WIFO)</i>	55
2.5.1	Contribution to Central Question 1	58
2.5.2	Contribution to Central Question 2	58
2.5.3	Contribution to Central Question 5	61
2.5.4	Outlook for the second phase	61
3.	From Analysis to Policy Conclusions <i>Kurt Bayer (WIFO)</i>	65
4.	Cross-cutting Issues	68
4.1	Understanding socio-technical sustainability transitions and policy implications <i>Frank Geels (Manchester University)</i>	68
4.1.1	Introduction	68
4.1.2	The multi-level perspective (MLP) on socio-technical transitions	69
4.1.2.1	Unit of analysis and conceptual backgrounds	69
4.1.2.2	Multi-level perspective	73
4.1.3	Policy implications	79
4.1.4	Real-world problems in policy implantation and sustainability transitions	80
4.1.5	Concluding comments and possibilities for future acceleration of transitions	86
4.2	Gender regimes and gender policies in Europe – Searching for welfare, work and gender equality <i>Janneke Plantenga (Utrecht University)</i>	89
4.2.1	Introduction	89
4.2.2	Changing patterns of labour force participation	91
4.2.3	Welfare state policies	94

4.2.3.1	Tax System	95
4.2.3.2	Family policy	98
4.2.3.3	Organisation of work and working hours	105
4.2.3.4	Summary	108
4.2.4	Towards new models of gender equality?	109
4.2.5	Conclusions	111
4.3	Subjective well-being and socio-ecological transition <i>Gunther Tichy (WIFO)</i>	113
4.3.1	Definitions and data	114
4.3.2	Determinants of life satisfaction	119
4.3.2.1	Individual determinants of life satisfaction	119
4.3.2.2	Economic determinants of life satisfaction	122
4.3.2.3	Social determinants of life satisfaction	126
4.3.3	Life satisfaction and the goals of WWWforEurope	129
4.3.4	Some reflections on policy solutions	133
4.3.5	Summary	136
4.4	Modelling the inter-linkages between macroeconomic, social and ecological aspects of a sustainability transition and long-term growth <i>Kurt Kratena (WIFO), Mark Sommer (WIFO)</i>	137
4.4.1	Introduction	137
4.4.2	The DYNK modelling approach	138
4.4.3	Stylized facts of long-term growth, the environment and the labour market	144
4.4.4	Inter-linkages and modelling work	151
	References	155
	Annex	171
	Annex 1 – Area Summaries	171
	Annex 2 – Gender regimes and gender policies in Europe <i>(Janneke Plantenga)</i>	186

Tables and Figures

Table 1	Material consumption and growth output	11
Table 2	Energy consumption and growth output	11
Table 3	Policy challenges illustrated for a transition to sustainable energy	33
Table 4	Three pillars of institutions	72
Table 5	Time lag between years of invention and innovation for some new technologies	74
Table 6	Different policy paradigms	80
Table 7	Number of data points in the World Database of Happiness	116
Table 8	Relative effect sizes of different variables on satisfaction	128
Table 9	Main problems indicated by EU respondents in spring 2013	130
Table 10	Main country problems indicated by EU respondents in spring 2013	131
Table 11	The annual impact of the factor bias on factor share, E	146
Table 12	The annual impact of the factor bias on factor share, L	146
Table 13	The total annual impact of technological progress on factor demand (factor bias plus TFP by industry)	147
Table 14	Price elasticities wrt the price of E	148
Table 15	Price elasticities wrt the price of L	148
Table 16	Employment rate and the employment impact of parenthood, 2012	186
Table 17	Fiscal incentive for secondary workers, 2011 – (sorted by AETR)	187
Table 18	The generosity of leave within EU member states, 2012	188
Table 19	Percentage of children in formal child care, 2012	190
Table 20	Working hours flexibility, 2012	191
Figure 1	Euro Area Shares of World Gross Domestic Product, 1980 – 2012	57
Figure 2	The emphasis on context and inputs leaves transitions an unpacked 'black box'	69
Figure 3	System optimisation versus system innovation	70
Figure 4	Socio-technical system for modern car-based transportation	71
Figure 5	Actors and social groups in organizational fields	72
Figure 6	Multiple levels as a nested hierarchy	73
Figure 7	Multi-level perspective on transitions	77
Figure 8	Diffusion as a process of niche accumulation	78
Figure 9	Energy-related carbon dioxide emissions by country	81
Figure 10	Production and consumption-based greenhouse gas emissions in the UK	82

Figure 11	Yearly number of articles in UK national newspapers containing the word 'climate change'	84
Figure 12	Global new investment in renewable energy by asset class, 20014-2014, \$billion	86
Figure 13	Total employment rate (20 – 64), Female-Male employment rate (2012), and EU 2020 target, 2012	92
Figure 14	Employment impact of parenthood for women and men aged 20-49, 2012	94
Figure 15	Fiscal (dis)incentives for secondary earners at 67% of average earnings (2011)	97
Figure 16	Total leave entitlement in weeks, 2012	101
Figure 17	Total effective leave entitlement (benefits at least 2/3 of salary) in weeks, 2012	101
Figure 18	Children using formal care as a percentage of all children (total hours), 2012	104
Figure 19	Overall and female part-time rates, 2012	107
Figure 20	Share of voluntary part-time work, 2012	108
Figure 21	Life satisfaction in countries differently affected by the financial crisis	117
Figure 22	The impact of TFP growth by industry on output prices	145
Figure 23	Gross Output, Energy Demand and Greenhouse Gas (GHG) emissions: Spain 1995 - 2009	150
Figure 24	Gross Output, Labor Demand, Labor Supply and Hours Worked: Spain 1995 - 2011	150
Figure 25	Rate of Unemployment: Spain 1995-2011	151

Editorial

Europe needs a change towards a socio-ecological transition based on economic dynamics in a time when it is facing challenges like the financial crisis, globalization, demographic shifts, climate change and new technologies.

Since April 2012 researchers from 34 scientific institutions in 12 European countries subdivided into 5 Research Areas (Area 1: European Welfare State; Area 2: Environmental and Biophysical Dimensions; Area 3: Innovation, Industrial and Innovation Policy; Area 4: Governance and Institutions at the European Level; Area 5: Regions in Transition) work on essential questions for Europe's future and lay the analytical basis for a socio-ecological transition. After 18 months, the **First Feedback Conference**, taking place on September 18th and 19th in Vienna, marked the end of the analytical phase of the **WWWforEurope project**. The research work of this phase started from the challenges mentioned above, exploring existing trends and institutions as well as best practices for the change envisaged. It was the aim of the conference to determine how the project findings of the 5 Research Areas can be merged to an overall project output and therefore to define inter-linkages between the individual outputs, highlighting possible controversial and cross-cutting issues as well as trade-offs and synergies. Hence, the Research Areas summarized how their findings contribute to the Central Questions¹ of the project and discussed their contributions in parallel bilateral groups. The discussions were joined by external experts and stakeholder representatives from European/international institutions, social partners, NGOs and academia, who provided an external perspective on the project and consequently important inputs to the work of the Research Areas.

In chapter 1 of this report Karl Aiginger outlines the mission of the project. Furthermore the importance of the project in view of current developments of the economy, social inclusion and ecological sustainability is highlighted. Chapter 2 summarises Area-specific contributions to the project's central questions and lists open questions and further research topics that will be added to the WWWforEurope research agenda at the end of the project. A first attempt to derive policy conclusions from results of the (often) centrifugal contributions of the many analytical papers is presented by Kurt Bayer in chapter 3. This chapter represents an important connection to the second "policy formulation" phase of the project. Chapter 4 includes four major cross-cutting issues presented and discussed during the conference. One article written by Frank Geels aims at developing a better understanding of the process of *socio-technical transitions* and at discussing *related policy implications*. Although the perspective is inspired by neo-Schumpeterian evolutionary economics, it also acknowledges the importance of political and socio-cultural processes. In the article on *gender regimes and gender policies in Europe* Janneke Plantenga examines modern and gender-equal elements of the welfare state. Gunther Tichy's review of the research on *subjective well-being* has in mind that a broad acceptance of WWWforEurope's science based policy recommendations will not be easy to achieve. A better

¹ The Central Questions of the WWWforEurope project are listed on page 12.

understanding of individual preferences is important for their realisation. In the last article Kurt Kratena and Mark Sommer describe a *macroeconomic model* analysing trade-offs and potential synergies between environmental, macroeconomic and labour market policies. The model is based on policy insights developed in different Areas of the WWforEurope project.

Finally, this conference report presents the policy relevant research output in the different Research Areas at the time of the Feedback Conference and shows the results and further research agenda in some of the core issues of the project. These issues comprise measuring wellbeing, gender issues and the welfare state, the economics of innovation, and model based policy analysis.

1. The mission of WWWforEurope - *First signals for transition and recent rebounds*²

Karl Aiginger (WIFO)

1.1 Introduction and Outline

The research project started in April 2012 and a large group of researchers have produced a considerable amount of papers up to now. It makes sense to start with an overview of the research already carried out and currently being undertaken to then connect the papers, to discuss synergies and conflicting results and to get some feedback from the stakeholders, academic community and policy experts. The feedback conference also to some extent wants to build a bridge between the analytical results (which dominate the research in the first two years) and the policy conclusions which mark the next phase before we can present a Synthesis Report of this 4 years project. The four goals of the Feedback Conference in Vienna in September 2013 were the overview of individual papers, connecting research, a first round of feedback from stakeholders, academia policy makers and to build the bridge between analysis and policy conclusions. This volume summarizes the main results of the discussion, cross cutting issues and open questions.

Section 2 recalls the mission of the project and its importance, then we describe current developments along the three pillars of the project, (i) economic development, (ii) social inclusion and (iii) sustainability and some policy reactions so far. Section 5 summarizes recent positive developments but also obstacles and backlashes on a strategy for new more inclusive and more sustainable dynamics of Europe. We conclude with open questions to be investigated by future research. This chapter is based on the introduction given by the coordinator to the conference; combining it with some results of the conference and developments thereafter. The more detailed results can be found in the chapters that follow in this feedback volume.

1.2 The goals of the project

The goal of the research project as defined in the tender is to provide the analytical basis for “Europe moving to a new path of economic growth and social development”. The growth path to be developed should follow the goals of smart, inclusive and sustainable growth as delineated in the Europe 2020 strategy. It should, however, extend much further into the future and call for a deeper social ecological transformation of a dynamic European society.

This is a very demanding task for several reasons:

- The current economic situation in Europe is still dominated by the Financial Crisis and its legacies, namely high debt and unemployment, low capacity utilization of firms, bad assets

² Introductory remarks to the Feedback Conference on September 18th and 19th, 2013. The author is grateful for comments of the conference participants and Gunther Tichy, Angela Köppl, Kurt Kratena.

in the banking system and increased uncertainty of economic agents. Disequilibria between countries and regions have increased, Europe is far away from its self set goals as regards employment, R&D, poverty reduction, energy efficiency and carbon emissions are not compatible with the EU Roadmap for 2050.

- Restarting economic growth is high on the economic agenda in the EU, specifically since the level of economic activity as measured by real GDP in 2014 is still below the pre-crisis peak of 2008 (while it is 9% higher in the US, 20% in the world and 60% in China).
- The emphasis on growth – as desirable to reduce unemployment – is currently not compatible with any climate strategy, as proposed by the IPPC or in the EU roadmap for 2050.
- Many scientists believe that a much lower growth path - or even no growth or a reduction of economic activity - might be necessary in order to cut emissions. Income growth probably has diminishing returns for wellbeing and happiness and this tendency will intensify with rising incomes. But the growth rate of an economy is the result of optimizing activities of households and firms under given incentives and government activities. And marginal utility of incomes are diminishing, but still positive.
- Finally income growth while reducing absolute poverty does not automatically reduce relative poverty or income dispersion. Lower growth or stagnation on the other hand leads to unemployment, increasing poverty and the petrification of society.

The project defines challenges for a new path: globalisation, new technologies, post industrialisation, reform of the welfare state, demographic changes and ecological sustainability. These challenges lead to five research areas each focusing on one of these topics which will then to be summarised in a Synthesis Report. The five research areas are (i) the challenges to the European welfare state, (ii) the ecological and biophysical dimension (iii) the drivers for change: innovation, industrial and innovation policy, (iv) governance structures and (v) the role of regions.

1.3 What happened after the Financial Crisis

The project was tendered in late 2010 so that it is interesting to analyse what has happened in the three years since (and in the recent past in general) concerning the three goals of smart, inclusive, sustainable growth.

Economic development

In 2010 there was some hope that the “Financial Crisis” or “Great Recession” - as it is called in the US literature - had receded, and recovery could even take the "V shape" of a quick recovery after a deep downturn. World trade - which had decreased by 26% in 2008/09 - restarted to grow rather strongly by mid or late 2009. Crisis management had been orchestrated with a surprising degree of international cooperation: blunt forms of protectionism were avoided. Fiscal and monetary policy was used to dampen the recession without historical parallel and the economists usually opposing countercyclical policy were silent or sidelined (Aiginger, 2010 B).

There were some doomsayers predicting a second recession ("stepwise downturn") or at least predicting an equal or stronger fall in production as compared to the thirties of the last century (e.g. Eichengreen and O'Rourke, 2009), but this was not reflected in any predictions by international agencies or leading national research institutes.

Looking at the structure of the anti-cyclical fiscal spending during the crisis "green" investment was only used as stimulus to a very low extent (see Aiginger, 2010 A). Even the measures to encourage the replacement of old cars by new ones ("cash for clunkers initiatives" which were effective insofar as they increased demand much quicker than infrastructure programmes) did not provide incentives to shift demand towards smaller cars with less emissions or to build infrastructure for electric, hybrid or gasoline driven cars. As far as social innovations were concerned short working time experiments were introduced and effectively reduced unemployment. The retraining of employees who lost their jobs was a very marginal issue (Aiginger, Horvath and Mahringer, 2012). Thus public programs introduced to combat declining demand in general missed the chance to promote social and ecological innovations.

What then really happened after the first quick recovery was a side movement. Technically a long and mild recession in Europe happened (from mid 2012 to end of 2013, six quarters long, with a cumulative minus of 3% for GDP). Growth was flat in the US (without being a technical recession) and in Europe there was a very strong divide across countries. Peripheral countries and specifically Southern Europe suffered a deep recession with GDP declining by more than 10 percent. The development in the year 2009 in these countries had not been worse than in other European countries, the problems of the postponed structural change in Southern Europe were hidden by artificial demand boosted by public expenditure, incomes from a construction boom, and high consumption relative to incomes. After the bubbles busted, and deficits of public finances and/or in current accounts became known, financial markets reacted with very high interest rates. The countries had to apply for help (for government or bank financing or both) and they were forced to reduce public expenditure and wages without any strategy or proactive components or fair contributions by the rich and untaxed part of the population (for a critique and strategy see Aiginger, Huber and Firgo, 2012). GDP is now 23% lower than 2008 in Greece, 7% in Spain and in Portugal, on the average of these three countries it is 12% lower. This was approximately the same as the loss in GDP in the Great Depression of the last century in industrialised countries (see Aiginger, 2010 B). The drop in employment in Greece, Portugal and Spain on average was -17% (leading to youth unemployment relative to total employment of about 50%). Since the consolidation started public deficits could be reduced, but public debt is high and still rising.

Europe started a common currency without credible fiscal rules and without a framework for keeping wage increases in line with productivity, therefore current account balances had turned into the red in some countries. Germany (and the Netherlands, Finland) accumulated large surpluses, the southern countries (including Italy and France) suffered large current account deficits. Unequal developments between sectors were disregarded, the same holds true for the bubbles in the construction, property and financial sectors. After the disequilibria were revealed, the discussion started whether it would not make sense to disentangle the "successful North" from the "failing South". The value of the EURO slid downwards and interest rates for debt

countries ballooned. On average Euro countries paid higher interest rates for government bonds than the US, the UK and Japan, despite the fact that each of these countries had a higher debt/GDP ratio than the Euro zone.

Indicators on social inclusiveness

Inequality indicators are lagging to some extent. Medium term evidence shows that for most, but not all countries, inequality within a country is rising (Aiginger, Guger, 2013). In Germany which had solved its problem of reduced cost competitiveness after German Unification by keeping wages below productivity and by creating a low wage sector, the very latest figures show somewhat higher wage increases and under the new government plans exist to raise minimum wages. At the other hand France, where unit labour costs had risen faster, suffered low growth over the past ten years and a deficit in the current account, government expenditure was cut and taxes on wages were reduced.

The unemployment rate is rising in Europe; it reached 12% in the Euro zone in 2013. Economic output is predicted to grow by 1.2% in 2014, which is not sufficient to reduce unemployment. Highest unemployment rates are reported in Greece, Portugal and Spain with an average of 24%, lowest rates in Austria, Germany and Netherlands (with about 5%). Youth unemployment is now above 20%, and near 50 % in some countries (if unemployment is compared with employment, less if related to the labour force in the age group).

The risk of poverty or social inclusion had declined in Europe until 2009 and a target of 96m people (remaining in this disadvantaged group) had been set for 2020. The minimum was reached in 2009 with 114m (against 124 in 2005). By 2012 people at risk of poverty and exclusion had yet again increased to 124m. The poverty risk ratio is 5% above the target. Risk of poverty or exclusion is 30% or higher in Italy and Greece and in six new member countries (EU Commission, 2014).

Indicators on energy consumption and emission

The latest developments on European performance in sustainability are not easy to assess, since the crisis lead to a decline in emissions and energy consumption, and post crisis data are available mainly up to 2011 only (Aiginger et al., 2013). (Gross) Energy consumption in 2011 laid 2% below 2000. It had increased between 1995 and 2008, than declined sharply in 2009, followed by a small increase and then a decrease again. It is unclear what will happen if industrial production rebounds. Currently total GDP and manufacturing output is still below 2008 in the EU.

CO₂ emissions are 10% lower than in 2000, as are greenhouse gas emissions.

Air pollutants are decreasing strongly, the decline for ammonia is about 20% down relative to 1990, and a similar strong decline happened for fine particulate matters. The decline is stronger for non methane volatile organic components and nitrogen oxides (here emissions were halved or nearly halved between 1990 and 2010). The emissions of sulphur dioxide plummeted to 20% of its level in 1990.

Waste generated per capita is above its level in 1995, but on the decline since its maximum in 2007 by some percentage points (which encourages but is probably not enough to meet its target (EEA Report 2013, p.30.)).

1.4 General policy reactions to rising disequilibria

Low growth and rising disequilibria across countries resulted in a severe crisis of the European Unification project. Some countries could no longer finance government debt, the current account deficits or losses of their banking system and needed help. The Euro found itself in serious trouble with some speculation about the euro zone breaking up or the EU in general (with calls for a core euro area or returns to national currencies).

In response to the turmoil around the Euro the persistent government deficits and the problems of Southern-Europe zone, governance methods were reformed. Regarding fiscal surveillance the so called fiscal pact was enacted, together with a “Two pack” and a “Six pack”. The ESM and ESF were established as European funds to reduce future risks of government finance (and to some extent also banking). Eurobonds as an investment to finance national governments by jointly raising credits were abstained from, the same holds true for strategies for long-term debt redemption. A systemic risk board was created to stabilise the financial sector, new forms of regulation with some elements of macro prudence and higher equity requirements were enacted and stress tests were performed. Plans for a Banking Union which should provide European surveillance, rules for dissolution of banks, and guarantees for deposits are in the pipeline. All the initiatives to bolster employment and growth remained vague and small. The additional governance reforms needed and policy changes required are summarised in the first policy brief of WWWforEurope (Aiginger et al., 2012).

Mario Draghi declared on July 26th 2012 that the European Central Bank would do “whatever it takes” to stabilise the Euro zone. This led to a decline in interest rates, and together with the first positive results of their austerity programs Ireland and Spain could start to refinance at somewhat low rates in 2014. The Euro is stable and at the end of the year 2013 still 18% higher relative to the USD than at its start. The creation of the ESM, plans for a banking union, and some first reforms to tackle youth unemployment added to the stabilization of Europe.

1.5 Socio-economic transition and dynamics

A new European strategy for growth and development has to be deliver dynamics, inclusion and sustainability. Dynamics is predominantly measured by growth of GDP. We have seen already that GDP in 2013 (and even after a small gain in 2014) is still below pre crisis output. And all medium or longer term forecasts for Europe predict growth rates between 1% and 2% in the medium term and even less in the long run. These rates are less than half of those experienced in industrialized countries in the past decades.

While growth of GDP is the most popular indicator for dynamics, it is not a suitable measure for welfare or well being. Welfare includes other economic and non economic goals, and consensus is mounting that a set of Beyond GDP Indicators would be a better measure. Incomes and income dynamics are still one of the goals of citizens, but by far not the first

priority at least for richer countries, regions and persons. It may however be an instrument for reaching other goals (e.g. employment, sustainability of pensions), and this function may be dependent on incentives and policies, so that it can be changed in the long run.

The globalising world economy is becoming ever more open and competitive. Emerging countries will produce a larger and increasing share of world output as compared to industrialised countries due to higher population growth and catching up in income per head. New technologies will be disseminated with higher speed than in the past. Industrialised countries with high incomes have to adopt a high road strategy if they want to increase welfare as measured by beyond GDP goals. A high road strategy has to build on competitive advantages like innovation, education, productivity, quality and customising of products. Welfare increases in rich countries will depend on social and ecological innovations, raising energy efficiency and renewable energy sources.

Summarizing, the recent three to five years have been years of extremely low dynamics in Europe (relative to the past and relative to competitors in emerging but also in other industrialised countries). Let us turn to social and ecological transition, and look for encouraging developments as well as some backlashes (rebounds).

1.5.1 Positive signals (sprouts of change)

- The share of renewables in energy is increasing. In Portugal as well as in Sweden and Austria the share of renewables in electricity production is already about or above 50%. The rising share of renewables even leads to problems of regional oversupply in Germany, since transmission to other parts of the country has been limited by insufficient grid capacity. The time shape of supply of renewables, makes complementary other sources necessary; since emission trading broke down, coal regained price advantages and its use has intensified. Additionally opposition raised due to high subsidies are considered as an asymmetrically high burden for consumers. These are normal problems which arise when implementing a new strategy, but the problems created opposition which then questions the whole strategy.
- There is remarkable progress in the development and use of hybrid cars³ and to a minor extent also of fully electric cars. China is eager to develop small electric cars to reduce the smog in the cities; a new US firm provides electric cars at the high end of the spectrum taking the first place in newly sold cars in Norway.
- Public transport as well as bikes (including electric driven ones) have gained market shares in many urban areas.
- There are signs of a sharing economy, where new cars and machines don't need to be bought but could instead be rented.

³ For hybrid cars the overall environmental impact can be assessed only if the production (not only the consumption phase) is incorporated.

- Material consumption was 14% lower in 2000 than in 1970 and further declined by 13% between 2000 and 2010 (Fischer-Kowalski et al., 2013, see also Table 1).⁴
- For nearly all industrialised countries there are signs of relative decoupling, insofar as energy consumption (and even more fossil energy) increases with lower rate than GDP (as shown in Table 2).
- Table 2 further reveals that the Danish economy succeeded in an absolute decoupling of its energy consumption: while GDP more than doubled between 1970 and 2010, consumption of fossil energy decreased by 23%.
- For new buildings low energy and zero energy techniques became available. Denmark decided to forbid the use of oil for new buildings (offices and private homes) from 2016.
- In general global warming is now seen as a scientific fact by 97% of scientists. Limiting the warming of the atmosphere to a maximum of two degrees by 2100 is an established international goal.
- The Kyoto targets and well as the three goals of the EU 20/20/20 strategy seem to be attained in the European Union (with some help of slow growth and recession). However the 2020 goals need more ambitious substitutes if the goals of the 2050 roadmap for sessile energy reductions are to be attained.
- GDP is not substituted by other indicators to monitor the short-run dynamics, but the number and use of alternative indicator systems (OECD's better life indicators etc.) as well as overall indicators (life expectancy, happiness) are on rise.

1.5.2 Backlashes and rebound effects

- Europe is far away from establishing an operational strategy in line with the goals of the energy roadmap until 2050, i.e. reducing fossil energy by 80%. There are calls for coping with the US low energy prices inter alia by allowing shale gas exploitation in Europe.
- No binding agreement on international energy standards is likely to be reached by 2020.
- The European emission trading regime for CO₂ broke down, and there is a very low priority to re-establish the system or even to make it broader or more ambitious. The new Australian government abolished the CO₂ tax (on the other hand China established it in seven cities).
- Energy policy is re-shifting priority (from supporting energy efficiency and increasing the share of renewables) to the old strategy of emphasising "affordable prices" and the "security of supply". The German "Energiewende" - to phase out nuclear energy - is under pressure and softened in the new coalition agreements.
- Industrial policy which had announced putting "sustainability on the centre stage" (European Commission, 2010), is now shifting its attention to keeping up with the cheap production costs in the US (low wages, low energy costs). Low wages and low energy

⁴ For differences in decoupling between production and CO₂ emissions and that in consumption see Munoz, Steinger 2012, thanks to Angela Köppl for this reference.

prices are feared to support the reindustrialising of the US while reducing European market shares, despite a large trade deficit in the US and a surplus in the current account balance for Europe.

- Attempts to establish an airline carbon tax do not look promising.
- There is very low emphasis on alternative energies in Greece, Italy, the UK and France.
- Germany and France are lobbying for the postponement of and less stringent emission standards for cars.
- There is a renaissance of coal (it is the fastest increasing energy source in Europe) and nuclear energy is returning via the so-called "neutrality approach".

1.6 Open questions and progress needed in research

No absolute decoupling so far and best practice

Up to now there is **no large economy** or economic region in which economic output is rising, but emissions and material consumption is declining strongly. There is ample evidence that relative decoupling is feasible, and that the degree of energy decoupling can be influenced by economic policy and industrial structure. The share of fossil energy can be reduced by policies increasing energy efficiency and the share of renewables. Zachmann et al. (2013) and the European Economy (2013) show that at least up to 2010 Europe managed to compensate lower US energy prices through higher energy efficiency. Decoupling material consumption from economic output has been realised (with some shifts of consumption to imports). Denmark seems to be a possible "best practice" for absolute decoupling, it would be interesting to analyse this model. Specifically the questions that should be investigated are whether there are specific circumstances which made it possible, and whether the decoupling will be persistent, and which policy measure promoted this success, and how much has been shifted to indirect material consumption and energy use via imports.

Persistency of Okun's law and signs for decoupling of employment

Up to now there is **no economy** with low growth (or declining output) without unemployment increasing, specifically youth unemployment. The rise of unemployment can be limited, if there is a declining population and if inward migration is prevented, and if rising labour supply due to the higher participation of women and elderly is limited. Thus Italy and Japan have low unemployment rates despite of slow growth. The external trade balance, however, worsens and public debt sky rocks in these countries. The possibility to "weaken" the relationship between growth and employment by reducing the working time needs to be investigated. The same holds true for shifting technical progress to a path with lower increases in labour productivity and for shifting output structures towards a higher services content ,

Therefore a main research issue – probably the most demanding for a new path of development – is to ask at the one hand how to combine lower growth with full employment, openness and chances for young people (and other "outsiders") and on the other hand how to combine a significant reduction of material consumption and fossil energy with high economic activity. The task is even more demanding for an open economy especially in a fast growing world economy,

where other regions put less emphasis on sustainability and social inclusion or are growing much at a much higher rate (with implications for shifts of foreign direct investment and the migration of highly qualified people).

Table 1 **Material consumption and growth output**

	1970/2010		2000/2010	
	Material consumption	GDP	Material consumption	GDP
Average change per year in %				
<i>Five largest increases</i>				
Portugal	2.9	2.7	0.0	0.6
Greece	2.7	2.2	-1.2	2.1
Spain	2.3	2.7	1.2	2.1
Austria	0.7	2.4	-0.3	1.5
Finland	0.5	2.6	0.6	1.8
<i>Five largest reductions</i>				
United Kingdom	-0.8	2.3	-2.1	1.7
Germany	-0.7	1.9	-1.4	0.9
Denmark	-0.4	1.8	-2.1	0.6
Sweden	-0.3	2.1	-1.6	2.1
Belgium	0.0	2.1	-0.3	1.4
EU-15	-0.1	2.2	-0.7	1.2

Source: Eurostat, WIFO calculations

Table 2 **Energy consumption and growth output**

	1970/2010		2000/2010	
	EU-15	Denmark	EU-15	Denmark
Cumulative growth				
CO2 Consumption (Mt of CO2)	-0.8	-14.6	-5.4	-7.1
Total Primary Energy Supply	40.5	4.0	0.9	3.3
Fossil Primary Energy Supply	11.9	-22.9	-3.9	-8.0
GDP	138.8	103.5	13.2	5.8

Source: Eurostat, WIFO calculations

2. Area Summaries

One aim of the first WWWforEurope Feedback Conference was to provide the possibility to the five Research Areas to discuss their work of the project's first analytical phase with each other. Therefore they prepared summaries containing the contribution of the Area's outputs to the project's five Central Questions:

- 1.) Can the EU at the same time participate more strongly in world growth, guarantee a maximum well-being of its population and reduce energy and material input?
- 2.) How can regional cohesion and social inclusion be achieved in such a growth strategy minimising risks of detrimental effects on incentives and maintaining the openness of society?
- 3.) How can social and technological innovations be supported (and the focus of technological trends be shifted) so that they contribute to social and ecological sustainability?
- 4.) How can institutions of modern market economies be changed so as to internalise the current social and ecological externalities and to decrease volatility and divergence in Europe?
- 5.) How can the general public, third sector actors and vested interests be motivated to support reforms towards a new growth path?

The summaries are based on milestones and deliverables finalised until September 2013. Wherever possible, milestones and deliverables that have not been finalised or even started were also included.

This chapter presents the Summaries of the five Research Areas that were revised on the basis of the discussion outputs of the Feedback Conference. Each sub-chapter refers to a Central Question, but since the Research Areas do not contribute to the same extent to the questions, they lay different focuses in their Area Summaries and address the questions with different intensity. Some Research Areas have put together relevant abstracts of their outputs, which can be found in Annex 2 and others identified open questions and further research topics that will be relevant for the research agenda at the end of the project.

2.1 Summary of Area 1

Hans Pitlik (WIFO), Thomas Leoni (WIFO)

Area 1 deals with economic and political challenges for Welfare States. Research in the Area is exploring the influence of globalisation, demographic changes, use of new technologies and post-industrialisation on Welfare State structures, taking into account the significant fiscal constraints that European countries are facing particularly since the outbreak of the financial crisis.

In the analytical phase, Area 1 addressed several central questions posed in the WWWforEurope project with different intensity. Clearly, research devoted to Welfare State reform contributes primarily to a better understanding of how social inclusion can be achieved in a new growth strategy, minimising risks of detrimental effects on incentives and maintaining the

openness of society (Question 2). Question 4 asks how institutions of modern market economies can be changed so as to internalise the current social and ecological externalities. It is therefore deeply intertwined with Question 2. Area 1 results on issues of new social risks, on the impact of globalisation on Welfare State reform requirements and on the demographic challenges relate simultaneously to both of these questions.

In three papers, Area 1 deals with problems associated with a political implementation of Welfare State reforms. Results also contribute to a better understanding of political obstacles and sources of opposition to a socio-economic transition in general (Question 5), exemplified by studies on the transition process in Central and Eastern European Countries (CEECs). Predominantly methodological aspects of two Area 1-papers also add new data background to Question 1, creating deeper insights how Europe can simultaneously participate more strongly in world growth, guarantee well-being of its population and reduce energy and material input. The input of Area 1 to Central Question 3, how social and technological innovations can be supported so that they contribute to social and ecological sustainability, is limited and of a rather general nature than particularly focused on this topic.

In a nutshell, main results of Area 1 concerning Central Questions can be summarised as follows:

1) Can the EU at the same time participate more strongly in world growth, guarantee a maximum well-being of its population and reduce energy and material input?

Human capital is a particularly important driver of sustainable economic growth. In the first project stage, research in Area 1 develops new methods and data bases on global migration flows and on educational attainment. The obtained results can be used to improve population projections and projections on education mobility and inequality, thereby contributing to a substantially better understanding of expected future challenges for economic development.

2) How can regional cohesion and social inclusion be achieved in such a growth strategy minimising risks of detrimental effects on incentives and maintaining the openness of society?

Results from Area 1 papers covering different aspects of social policies indicate that policy strategies which are directed mainly at actively removing sources of inequality of opportunity, and which follow an enabling strategy ("social investment approach") instead of a passive ex post-equalisation of inequalities, are more likely to be conducive to efficiency and equity goals than not, and is at the heart of arriving at both increased fairness and sustainable economic growth. Evidence on discrimination based on gender, ethnicities, and other risk groups in society clearly suggests that EU Member States still have room to improve in providing equal economic opportunities in the face of challenges from post-industrialisation, globalisation, ageing and migration.

3) How can social and technological innovations be supported (and the focus of technological trends be shifted) so that they contribute to social and ecological sustainability?

The contribution of Area 1 to this question is related to the process of technological diffusion and acceptance of changes in the general public (see Central Question 5). The relevant papers emphasize sources of opposition to fundamental policy change stemming from ideological

convictions, or behavioural 'anomalies' (endowment effects, loss aversion), which may also be relevant obstacles to the introduction of technological innovations.

4) How can institutions of modern market economies be changed so as to internalise the current social and ecological externalities and to decrease volatility and divergence in Europe?

As regards the challenges of Welfare State reform requirements, questions 2 and 4 are closely intertwined. Area 1 research shows that the suitability of different (social) policy institutions to reduce inter-country variability in the responsiveness to shocks also depends on the design of Active Labour Market Policies. It is also shown that traditional risks over the life course are often underestimated. Analyses employing new methods for calculating life time periods of transfer dependency, reveal that spending requirements from an ageing population become even more pressing than traditional measures show. In consequence, reforms of Welfare States directed at increasing the fiscal sustainability of pension (and other transfer) schemes will have to take into account the interactions between various institutional arrangements and life cycle surpluses and deficits. In particular, in addressing gender issues any reform needs to take into account not only public transfers but also the production of services within the household for own consumption.

Central and Eastern Europe countries (CEECs) have already experienced a far reaching restructuring and transition of their welfare systems. Based on the Varieties-of-Capitalism literature, cluster analysis results reveals that there are two "worlds of redistribution": a liberal cluster of Anglo-Saxon type systems recently joined by some CEECs (Baltic countries, Slovakia, Bulgaria and Romania) and a cluster of consensus-based coordinated systems with stronger preferences for spending and redistribution. The question of a convergence of CEECs towards (one of) the prototypes or whether CEECs rather establish new types of capitalism still cannot be answered conclusively.

5) How can the general public, third sector actors and vested interests be motivated to support reforms towards a new growth path?

Theoretical and empirical results suggest that an understanding of opposition to fundamental policy changes is incomplete if it is only based on a view of reform-resistance that is simply driven by self-interest of voters and special interest groups, representing losers from change. The micro-evidence of Area 1 papers underlines the role of core beliefs and informal institutions in the process of attitudes and preference formation, in particular the role of procedural fairness considerations and individual life control perceptions. Voters need a minimum of confidence in democratic institutions in order to accept the uncertainties associated with a far-reaching change. Reforms cannot be successful if they exclusively focus on market inefficiencies and weaknesses of the social and economic system. A promising strategy must also aim at a build-up of beliefs, and credibility and trust in governmental institutions.

2.1.1 Contribution to Central Question 1

Central Question 1 is not the focal point of Area 1 research so far. However, the methodological parts of two papers contribute substantially to a better understanding and identification of the problems related to CQ1.

Future well-being of the European population depends on numerous factors. Any restrictions and prospects for a socially and environmentally sustainable growth path are doubtlessly affected by major directions of demographic development. Population forecasts suggest that most European countries will face a rapidly ageing society, as well as increasing diversity in their foreign born population. Increasing diversity is likely to raise demands on Welfare States in terms of integration and will in all likelihood also reframe the debate on equal opportunities among different groups of the population. Given persistently low fertility rates and increasing life expectancy in European countries, migration is however not only a core challenge for Welfare States. It is also of critical importance for economic growth and environmental (e.g. energy use) issues.

While a large body of literature is devoted to understanding the impact of the structure of migration flows, much less is known about the likely development of the country and education structure of migration in terms of forecasts. Against this background, Crespo Cuaresma, Moser, and Raggl (2013) develop new econometric methods for modelling migration flows in Europe. The paper finds that migration flows can be explained by standard gravity model variables such as GDP differences or geographical distance, and it proposes a method that allows to assess global migration flows using the fact that available net migration rates are nonlinear aggregates of bilateral migration flows. The authors show that a quasi-maximum likelihood method performs well for underlying bilateral specifications with good explanatory power for migration flows. To the extent that the likelihood of rare events (catastrophes, wars, etc.) varies systematically across countries, the destination and origin region dummies partly capture such effects. The same way, the effect of such events may be additionally captured by the existing migration stocks and the effect of income changes, both of which are included in the model.

The methods developed can be used to improve population projections and assess future migration scenarios in the framework of the policy discussion on ageing in developed economies and its effect on Welfare State sustainability. They allow for a better understanding of present and future policy challenges by providing new quantitative instruments for prediction and scenario building. The usefulness of such models is exemplified by combining estimated specifications with population and GDP projections in order to assess quantitatively the expected changes in migration flows to Europe in the coming decades.

In a second paper, Crespo Cuaresma, K.C., and Sauer (2013) construct a new dataset of inequality in educational attainment by age and gender at the global level. This research investigates interactions among education mobility, education inequality and demographic change, and the role that such an interaction plays in shaping economic growth differences across countries. The paper develops future scenarios concerning not only the age composition in European countries but also corresponding educational attainment levels. Against this background, challenges to economic growth emanating from expected changes in the distribution of educational attainment can be assessed more accurately. Crespo Cuaresma, K.C. and Sauer (2013) find that beyond the link between educational attainment and income developments, also intergenerational education mobility is positively related to economic growth. Countries that have succeeded in reducing educational disparities in particular in their younger cohorts have grown more rapidly in the last five decades than countries which have

been less successful in this endeavour. According to these results, policies aiming to provide broad-based access to schooling and improving intergenerational education mobility and equal access to education have a double positive return in terms of economic development.

2.1.2 Contribution to Central Question 2

From a very general and broad perspective, results from all Work Packages 101-103 indicate that economic and social policies which are directed at removing sources of inequality of opportunity, and Welfare State policies which follow an enabling strategy ("social investment approach") are more likely to be conducive to growth performance than not. Such a policy strategy rests on the assumption that stronger investment in human capital is at the core of arriving simultaneously at increased fairness, social inclusion and stronger economic growth. Hence, the often postulated trade-off between growth and equality does not apply in general. Countries looking for a growth-friendly social and economic policy approach should primarily focus on policies to support employability and mobility, to provide equal opportunities and to avoid any exclusion or discrimination on the basis of gender, ethnicity, or other characteristics.

While this appears to be a rather trivial policy conclusion, the evidence on differences in economic outcomes between genders, ethnicities and other risk groups in society, which is documented in Area 1 research as well as in numerous other papers, clearly suggests that many EU Member States still have some room to improve with respect to providing equal opportunities to all of their residents.

Area 1 research obviously cannot cover all potential risks and policies. Instead, the Working Papers focus on selected challenges for the Welfare State from globalisation, demographic developments and a transformation from more traditional modes of production towards a post-industrial society and associated changes in life-styles and habits. All the results appear to point in a similar direction. However, any generalisation of results must always be treated with some caution.

For example, Leoni and Eppel (2013) focus on the reconciliation of family and work as one of the most important "new social risks" contemporary Welfare States are facing. It is primarily women who are exposed to the risk of experiencing some sort of conflict associated with different combinations of family and work. Leoni and Eppel (2013) identify distinctive life-span employment profiles of mothers in European countries and examine the potential link between work-family profiles and health outcomes. They find that women with a high socio-economic status of parental home, good childhood health and high cognitive skills are more likely to reconcile care for children with continuous employment over the life-cycle. Those who can combine motherhood with stable employment also tend to be endowed with above-average health status. Working not at all, only marginally, or with several interruptions is associated with less favourable health outcomes, except in the Southern European countries. As the choice of work-family profile is not random, these results provide evidence to justify increased social policy intervention especially for women at childbearing ages to facilitate the combination of family and continuous employment. Similarly, larger gender differences in educational attainment which are observed in Crespo Cuaresma, K.C., and Sauer (2013) point to positive

growth effects of policy efforts aimed at providing equal chances to education for young cohorts, and in particular to women.

By contrast the papers considering potential challenges for the Welfare State arising from globalisation stress the important role played by policies that support workers in their inter-regional, inter-sectoral and occupational mobility, as well as emphasizing the value of training in particular of the low skilled and subsidising workers to take up employment. Lechthaler and Mileva (2013) develop a dynamic trade model with comparative advantage, heterogeneous firms and workers and endogenous firm entry. The paper provides new insights on the multiple distributional implications of trade liberalisation, based on an analysis of the adjustment process to economic integration. A major implication of their theoretical model is that it is not a good idea to exclude certain sectors from liberalisation because this reduces the benefits of integration, while failing to protect vulnerable workers. Labour mobility assumptions are also crucial for the distribution of income across workers. In a scenario where skilled workers are relatively less mobile than low skilled ones due to their previous investment in sector-specific human capital, skilled workers in the import-competing sector may even become the biggest losers, while skilled workers in the exporting sector are the biggest winners from trade liberalization. This is a striking result as a negative effect on wage inequality from trade liberalization is usually associated with the incomes of low-skilled workers in the import-competing sector. In this particular case, labour market policies should also take into consideration moving subsidies to high skilled workers so that they can switch their sector of employment more easily, which would pit however efficiency versus equity goals to a certain degree. In addition, low-skilled workers value the option to train and become high-skilled in the exporting sector very highly.

Further Area 1 research suggests that increased migration and population ageing are interlinked processes, yet with distinct challenges for the respective welfare systems. Increased migration can help prevent population ageing and a decline in the workforce, but the economic consequences of migration are strongly dependent on skill structure of migrants. This stands in contrast to a simplistic view held in public debates, according to which migration is an automatic remedy to fiscal consequences of ageing. Huber and Oberdabernig (2013) investigate relative fiscal contributions of migrant and native households to Welfare States. They find that differences in benefit take-up are largely explained by household size, age and education of the household head. In contrast, in many countries significantly lower net contributions of migrant households persist even after controlling for such observable factors, due to both lower tax payments and less successful labour market integration of migrant households. Selective migration and sound integration policies are therefore the most effective means to avoid fiscal burdens of migration.

While immigration of highly skilled labour would be desirable for the EU, forecasts by Crespo Cuaresma, Moser, and Raggl (2013) suggest that future migration will stem from low income countries and low skilled workers in the long run. One possible policy response would be to target skilled migrants, e.g. through points-based systems in immigration laws. To be fully effective such measures yet have to be accompanied by making Europe more attractive as a destination for highly skilled labour. This may entail, for example, a reform of migration policies to facilitate labour market entry as well as political participation among the migrants. Highly

fragmented labour markets, which impose restrictions for a mutual recognition of qualifications and for the portability of entitlements to social security systems even for intra-EU migrants, are also an impediment to attract high skilled migrants from abroad.

2.1.3 Contribution to Central Question 3

The contribution of Area 1 to this Central Question is only limited. Our results regarding Central Question 5 (see below) can however also be interpreted such that some sources of opposition to fundamental policy changes stemming from core beliefs, ideological convictions, or behavioural 'anomalies', are also relevant obstacles to the introduction of technological innovations (as also discussed in Area 2 working paper by Gazheli, Antal, and van den Bergh, 2012). Moreover, one might also argue that technological and organisational progress (social innovations) may also contribute to changes in the work environment so that labour market participation of social risk groups, such as (young) mothers or older people, can be improved.

2.1.4 Contribution to Central Question 4

As regards the challenges of Welfare State reform requirements, questions 2 and 4 are closely intertwined. Area 1 results obtained for Central Question 2 are therefore also relevant here, and *vice versa*.

The recession following the Financial Crisis has shown again a high inter-country variability in the responsiveness of both output to shocks and employment to output contractions. A key aspect of Kopasker, Görg, Molana and Montagna (2013) is that inter-country differences in firm size can be an important channel through which external shocks impact on aggregate outcomes. This channel is of high relevance in predicting the effectiveness of policy interventions to mitigate effects of volatility, and is also of critical importance for the design of labour market policies.

Country-specific productivity responses to shocks have frequently been explained with differences in labour market institutions and/or in aggregate structures. According to this view, e.g., countries which are specialised in labour intensive sectors experience stronger employment responses to adverse economic shocks. Intra-industry inter-firm heterogeneity and selection is a further channel through which shocks, by affecting average industry productivity, impact on volatility, employment and welfare. In countries with a lower firm heterogeneity – i.e. with a firm size distribution that is more skewed towards smaller (and less efficient) firms – a negative shock should have a stronger negative effect on aggregate employment. Countries with a more 'efficient' distribution of firms weather out shocks better, experiencing a weaker anti-competitive selection effect, and smaller aggregate employment and welfare losses.

Within this framework, Kopasker et al. (2013) examine the effectiveness of Active Labour Market Policies (ALMP) by means of employment subsidies. Their model implies that competitive selection and intra-industry structure affect efficacy of ALMP in countering a negative shock. In most cases optimal use of ALMP entails taxing firms and subsidizing workers. In their model, a uniform policy that does not discriminate between production for domestic markets and for exports is, from a welfare point of view, inferior to a policy that entails picking winners (i.e. exporters) by taxing their production for export in order to sustain

aggregate demand and employment via worker subsidies. These results go against a popular assumption that subsidies to firms for hiring of workers are more effective than worker subsidies in encouraging labour participation and generating employment. Consistent with a social investment model, ALMP complement the more traditional insurance role of the Welfare State by enhancing aggregate productive efficiency.

Some more traditional forms of redistribution and insurance against risks of income losses will nevertheless still have to play a role in European Welfare States. In this respect Area 1 results suggest that an analysis of redistribution over the life cycle and of the impact of life cycle events is needed to design effective policies. Hammer, Prskawetz, and Freund (2013) consider the reallocation of resources across age, based on the National Transfer Accounts (NTA) project. The authors are going beyond a standard methodology by adding a gender dimension and including unpaid household work. Besides asset accumulation, they consider intra-familial as well as public transfers as important mechanisms of a reallocation of resources across age and gender.

In contrast to the widely used demographic dependency ratios that apply exogenously fixed age limits to separate life cycle stages of dependency and working age, Hammer, Prskawetz and Freund (2013) introduce dependency ratios that are derived from data of age-specific averages of consumption and labour income, extended by the time used for unpaid work. They calculate a life cycle deficit/surplus as the difference between consumption and labour income at a particular age. Results indicate that the ages at which people at a younger age move out of, respectively move into life cycle deficit phases at an older age, differ substantially from the fixed age limits applied traditionally in economic dependency ratios. When using the life cycle deficit as an indicator, it can be shown that people stay dependent 10 years longer as compared to the demographic youth dependency ratio, frequently a consequence of longer education periods. Also, individuals become transfer-dependent several years before the age of 65, which is commonly used for calculating old age dependency ratios, as a consequence of early retirement schemes or lack of age-adequate working conditions. This indicates that increases in transfer spending resulting from an ageing population will become perceptible much sooner than expected from current forecasts. Thus, the analysis highlights that some European countries are under heavy pressure in terms of sustainability of their current transfer system and given the demographic outlook for the next decades.

Far-reaching reforms and a fundamental restructuring of welfare systems have already been experienced by Central and Eastern Europe countries (CEEC). However, Welfare State institutions are still heterogeneous across EU member states. Lessons from CEECs seem to be especially relevant for a socio-ecological transition of the EU because the most profound and ambitious transfer of institutions in recent history took place in these countries at different speed.

Work Package 105 is concerned with strategies, developments and difficulties in the management of a transformation of the entire economic system (Schweickert et al., 2013). The underlying Varieties-of-Capitalism literature established two prototypes, the Liberal (LME) and the Coordinated (CME) Market Economies. Cluster analysis (Szanyi, 2013) and country studies on Slovakia (Sikulova and Frank, 2013) and Hungary (Orosz, 2013) allow drawing conclusions

by providing a first comparison of CEECs with respect to “old” EU members. The papers however also broaden the convergence-divergence discussion and further include aspects of innovation systems, macro stability, and the political background.

Preliminary results show that the question of a convergence of CEECs towards (one of) the prototypes or whether CEECs rather establish new types of capitalism still cannot be answered conclusively. It seems that there are two distinct groups of CEECs, which cluster either with the CME-groups or with the LME-group, and this distinction is most pronounced when using a forward looking measure of performance, i.e. their innovation capacity. Southern crisis countries are often categorized into a form of mixed market economies with sometimes contradicting institutional set ups.

A similar clustering analysis conducted in Area 4 confirms Area 1-clustering results to a certain extent but not completely. This is an indication that the results of such an exercise depend substantially on the underlying factors that are taken into account for the description of Welfare State models. Synergies may arise if one tries to integrate micro-aspects and macro-aspects of welfare regimes.

2.1.5 Contribution to Central Question 5

Welfare State reforms entail not only genuine economic questions on the optimal design of social policies but also the problem how the general public, third sector actors and vested interests can be motivated to support reforms. Theoretical reasoning and empirical results jointly suggest that a theory of Welfare State reform resistance is severely flawed if it is only based on a narrow view of reform-resistance simply driven by narrow self-interest of voters and lobby groups representing losers from a policy change. The micro-evidence of Area 1 papers, which is based on international survey studies, underlines the role of core beliefs in the process of attitudes and preference formation, in particular the role of procedural fairness considerations. Voters need a minimum confidence in democratic institutions in order to accept the uncertainties from far-reaching change. Results of these studies can – at least in part - also be used to explain antagonism against technological change and to a fundamental opposition to substantial socio-economic changes in general.

Heinemann and Grigoriadis (2013) deal with a special feasibility aspect of the socio-ecological transition. The authors investigate sources of overall reform resistance and behavioural types of opposition to reforms in particular which may pose serious obstacles to the necessary transition. Heinemann and Grigoriadis (2013) explore the different dimensions of reform resistance with a particular regional focus on Southern Europe, but with comparative data for the whole EU. The perspective is not limited to rational choice approaches, but rather points to preference anomalies, cognitive biases and other limited rationality phenomena with enormous potential for understanding reform blockades. A major contribution is the development of reform ability profiles to quantify several reform obstacles which enables one to compare EU countries in their likely reform disposition. These profiles confirm particular Southern European weaknesses: a low effectiveness in poverty protection, high inter-temporal discounting and uncertainty avoidance, a poor information level of the population and a deeply shattered trust in national institutions. In a micro-econometric analysis based on Eurobarometer survey data, it is shown

that several reform obstacles identified in theory are also empirically correlated with the individual inclination to accept reforms. One result is that outsiders, contrary to theoretical expectations, do not push for institutional change.

Pitlik and Kouba (2013) address determinants of individual support for Welfare State reforms and examine the interrelation of core beliefs (“ways of thinking”) with the perceived quality of a country’s institutional framework. Empirical results indicate that people who interpret their life course as being not at their own disposition report a substantially more positive attitude toward income equalisation and government interventions. A higher perceived quality of the administration and low confidence in private companies amplify preferences for redistribution and government intervention. Generalised social trust in other people is associated with support for redistribution and government intervention only if the perceived quality of administration is high and confidence in companies is low.

From a policy making perspective, however, such core beliefs considering trust and life control can at best slowly be altered. That is why they need to be taken seriously in attempts to promote change. If one wants to impact on attitudes probably the most meaningful strategy is to focus on education systems and (complementarily) on social policy in a long term perspective. In a society with a higher share of independent, self-confident, active people it is easier to introduce reforms which require a substantial overhaul of the Welfare State that sets the focus more on personal responsibility and provision.

Measures of social capital also play a decisive role in the analysis of Andréasson, Elert and Karlson (2013). According to a popular view, social cohesion promotes social acceptance of reforms, the idea being that in societies with high levels of horizontal and vertical solidarity, it would be easier to overcome reform resistance. The authors illustrate that social cohesion is a multidimensional concept, consisting of no less than five orthogonal components. Their empirical analysis shows that, in fact, most dimensions of social cohesion do not influence occurrence of reforms. However, fairness as merit, in contrast to ex post-equality, is shown to have a positive effect on policy changes.

As a case study, Scharle and Váradi (2013) contribute to the existing literature by identifying barriers to institutional change in rehabilitation services for the disabled. As far as disability benefits are concerned, there is evidence that a carefully calibrated combination of cash benefits, active labour market programmes, and behavioural conditions can curb growing inactivity without sacrificing income maintenance, as is now part of the standard labour market policy toolkit. Comparing policy developments within Social-democratic welfare regimes (Finland, Norway and Sweden) over the past twenty years, Scharle and Váradi (2013) identify fiscal constraints, historical commitment to equal rights, policy making capacity, and decentralisation as important drivers of policy change. While some of these factors are, at least in the short run, beyond control of policy makers, some can be strengthened by governments wishing to promote the long term performance of the welfare system. In particular governments can strengthen the capacity of public administration to commission and communicate empirical evidence supporting the case for reform, to design adequate policy changes and to monitor implementation of changes at the local level. Setting up more or less independent agencies to

monitor policy implementation at the central and local levels can also improve reform commitment.

However controversial and sometimes even contradictory, these general findings are presumably helpful to understand difficulties and constraints of designing sustainable Welfare State reform strategies. Reforms cannot be successful if they only address market inefficiencies and weaknesses of the social and economic system. A promising strategy must also aim at a build-up of beliefs, and credibility and trust in governmental institutions. Lack of credibility is one of the most serious bottlenecks for a successful and comprehensive policy change. For countries where trust in national elites, public administration and the democratic system is almost fully eroded, a strong European involvement in guiding the reform process may be a (transitory) substitute and help foster acceptance. Of course, this only holds as long as the EU institutions have a confidence advantage over national institutions.

2.1.6 Open questions, gaps, conflicts, trade-offs and synergies with other Areas

Environmentally sustainable growth and Welfare State

The general discussion during the Feedback Conference revealed that there is strong uncertainty about potential trade-offs between economic growth and environmental goals. This also induces a substantial uncertainty about the relationship between the Welfare State and ecological sustainability goals. Although a fundamental conflict of Area 1 recommendations for social and labour market policies to improve inclusion and foster sustainable employment and economic growth did not emerge, it remains an open question to which extent possible limits for a growth-orientation of Europe due to fundamental ecological restrictions will have an impact on social sustainability concerns.

One central aspect is related to financing needs to achieve Welfare State objectives and is thus of a structural nature. Even during the last decades, which have witnessed a tentative "Welfare State retrenchment", social expenditures as a whole have kept pace with GDP growth and in some areas (such as health care) have even outpaced GDP growth. Current welfare policies require high and in many instances increasing revenues from taxes and/or social security contributions. The ability to raise revenues is substantially dependent on reasonably high employment and productivity growth rates, i.e. on economic growth. This holds especially for the challenge of funding current pension systems, which are confronted with increasing dependency ratios, but is generally true for all expenditure based policies. A tighter financial constraint due to requirements of an environmentally sustainable "low GDP growth path" would make the question of a retrenchment of services more pressing – especially in the aftermath of the Financial Crisis. An important open question, then, is how a strategy of environmentally sustainable economic development should be designed to generate at the same time sufficient government receipts and to preserve a sound financial basis for expenditure policies. Making Welfare State revenues less dependent from GDP growth is hence an important future challenge. While one may obviously think of a shift towards higher taxation of natural resource use and environmentally harmful activities, higher energy prices will also increase the fiscal burden of poorer households. A stronger reliance of social security systems on general tax

revenues weakens the equivalence of individual contributions and insurance against risk. A further open question is related to the design of particular welfare policies in the light of environmental issues. From this perspective it could be desirable, for example, to integrate social investment policies, which aim at mobilising and activating certain groups in the labour market, with an ecological focus.

Acceptance of technological change in a fundamental transition

Area 1 discussion of Central Question 5 has clear overlaps with other Areas' research on technological transition policy (Areas 2 and 3). For example, Areas 1 and 2 both identify a number of common factors that are crucial for motivating change and reform acceptance: In both Areas, behavioural aspects, role of intrinsic motivations and of beliefs, and the importance of trust (particularly in government actions and in institutions) are emphasized, although the role of "rational economic factors" for behavioural change – like a correction of relative prices – should not be played down.

Yet, research on reform implementation has also identified a particularly important role for framing, communication and marketing of reforms; it is not only the pure economic content that matters for public acceptance of change. Moreover, Areas 1 and 2 share the view that providing and communicating protection against transition risks - in particular to highly vulnerable groups that may be affected substantially by changes - is necessary to safeguard political support. Hence, a bundling of reform policies which simultaneously distributes burdens and provides benefits of policy changes in different areas, may be conducive to overcome opposition to change from different groups of winners and losers in society. Moreover, although not a panacea, transformational political change appears to have a higher prospect for success if accompanied by values and beliefs, which may be addressed (slowly) through education and adequate communication policies.

Time horizon of change policies

In discussions with other Areas of the WWForEurope project the problem of the relevant time horizon for technological transition with Welfare State policies became evident. Political management of an ecological transition appears to have a longer-run (technical) angle, though it is frequently stated that urgent policy action appears to be inevitable. The planning horizon for required adjustments of Welfare State structures is usually said to be shorter, though fundamental reforms also require a longer perspective of many years, possibly decades – as illustrated by the duration of change in CEEC's welfare systems which are discussed in Areas 1 and 4. If Welfare systems are confronted with an additional challenge to mitigate the employment consequences and social hardships from a change in environmental or technological policies (energy policy, climate policy, innovation policy etc.) one of the most important questions is how and to which extent a synchronisation of transition policies would be required.

European and regional governance

Welfare State policies obviously also have a regional governance dimension. An important open question that has so far not been addressed by Areas 1 and 4 is to which degree reforms should be accompanied, managed or even enforced by the European Union level, i.e., at which governmental level policies to foster social inclusion should be implemented. Taking into account the socio-economic heterogeneity between EU Member States and even between regions within the respective countries, one would expect negative welfare effects of harmonising or centralising policies due to regional and national preference violations. Moreover, education policy, which appears to be one of the most important instruments to reduce inequality of opportunities, is sometimes also organised at a regional level, e.g. in Germany. Recommendations of Area 1 as regards education or welfare policies may hence also impact on the choice of institutional arrangements within regions. It has been suggested, for example, that on the one hand, a common European labour market could be a major driver for growth, but requires a basic set of common rules and institutions, and maybe even a more pronounced harmonisation of educational systems. On the other hand, the observed heterogeneity of European welfare systems, together with remaining substantial differences on economic development and Welfare State preferences, points towards a superiority of national policy solutions. Moreover, institutional competition among national (or regional, or local) authorities has the potential to be a key instrument for identification of 'good practices' and selection of superior policies. Centralisation of policies may hence be counterproductive when it comes to finding innovative policy solutions.

Beyond the positive question of whether a convergence towards certain prototype models can be observed, the normative question of whether policies should strive at a certain convergence – given the challenges for the Welfare State (demographic change, globalization, fiscal pressure...) which all EU member states are facing – appears to be highly relevant. Experience in CEECs suggests that an ideal 'one-size-fits-all' European Welfare State model does not exist.

2.2 Summary of Area 2

Jeroen van den Bergh (UAB)

Area 2 of the WWWforEurope project studies the potential conflict and trade-offs between growth and environment, with the aim to solve simultaneously employment, equity and sustainability challenges. The area consists of work packages that develop indicators of social welfare, provide a theoretical basis in terms of behaviour of relevant stakeholders and their likely responses to transition policies, formulate a transition policy mix consisting of environmental and innovation policy instruments, develop scenarios of resource use constraints for materials, energy and land on global and European levels, and develop a range of models to quantify the trade-offs and policy impacts. These various elements interact; in particular the indicators, behavioural insights, policies and scenarios provide input to the modelling phase. The models to be developed in Area 2 include a macroeconomic model, a disaggregated multi-country European CGE model and a multi-agent evolutionary model, each of which is able to deal with particular aspects of a sustainability transition and policy.

The Area 2 work completed by the end of the first, analytical phase of the project is preparatory so far in the sense that the actual modelling has not been finished and resulted in policy insights yet. Area 2 contributes especially to Questions 1, 3 and 4, slightly to Question 5, but not to Question 2.

In addition to the milestones summarized in the second part of this document, which provide the basis for the responses to the subsequent five central questions, the area has delivered an informal position paper entitled “Macroeconomics, financial crisis and the environment: Strategies for a sustainability transition”. This was written by M. Antal and J.C.J.M. van den Bergh and has in the meantime already been published in a special issue on “Financial-economic crisis and sustainability transition” of the journal *Environmental Innovation and Societal Transitions* (Vol. 6, 2013). This combines insights from mainstream and heterodox macroeconomics with environmental economics to arrive at creative strategies to solve unemployment and sustainability challenges simultaneously.

A summary of the responses by Area 2 to the central questions is as follows:

1) Can the EU at the same time participate more strongly in world growth, guarantee a maximum well-being of its population and reduce energy and material input?

This question has two elements. The first, “participate more strongly”, may in general be difficult if it is recognized that poor countries can (and have the right to) catch up in growth. For this means that the rich countries together will face a falling share in world growth, for an extended period of time, that is, until the others have caught up (if that ever happens).

Regarding the second element, whether growth and reduction of energy and material input can be combined, the best answer seems: probably not. The reason is that under growth it is very unlikely that environmental sustainability can be realized (as motivated in the detailed answer below). It therefore is better to focus on solving unemployment directly instead of assuming that growth is needed or sufficient to do this. Aiming for growth should be accepted as representing a risky strategy from an environmental perspective, which does not mean that growth will (always) be impossible or undesirable. The core challenge, however, is solving simultaneously unemployment and unsustainability (and inequity). This is not an easy goal either, but we suggest strategies which may be able to contribute to it (namely, by trying to circumvent growth). The more optimistic answer might be: According to the projections and scenarios reviewed, it seems that Europe would fare best by adjusting to low economic growth. This could be realized by giving less priority to growth (a-growth). It would allow for changing the balance of objectives regarding environment, equity and other public goals versus average income (the focus of growth aims).

2) How can regional cohesion and social inclusion be achieved in such a growth strategy minimising risks of detrimental effects on incentives and maintaining the openness of society?

(Note that we did not work much on this issue). Reducing resource use will not threaten regional cohesion as it is a matter of rising world market resource prices acting as an incentive to improving resource productivity. There will rather be convergence of economic (and environmental) performance of regions, implying distinct growth rates, notably higher ones for

poor regions and low ones for rich regions. Policy and strategic responses will of course create winners and losers in any region. The resulting inequity may require policy responses.

3) How can social and technological innovations be supported (and the focus of technological trends be shifted) so that they contribute to social and ecological sustainability?

We provide concrete examples of the role of learning and behaviour underlying technological and social innovation in various cases studied in Area 2 (this work is still underway). We argue that the importance of pricing of environmental externalities for stimulating the right tempo and direction of innovation is underestimated. Promising technologies are still expensive and need direct support.

4) How can institutions of modern market economies be changed so as to internalise the current social and ecological externalities and to decrease volatility and divergence in Europe?

A policy mix is needed, consisting of environmental regulation and technological support. Pricing of externalities is needed to avoid serious energy and carbon rebound. Non-pricing instruments like eco-labels or technological standards on an incomplete set of products run the risk of allowing for too much rebound. Attention is needed for regulation of marketing of carbon-intensive products and services. Public support of promising but still expensive technologies is still needed for some time as the sustainability transition will otherwise only have environmental and lack economic logic. The preoccupation of politics and society with growth should be tempered with careful information provision as growth is no panacea for the conflicting problems of our time, and in certain cases rather acts as a barrier to solving these (see the answer to question 1).

5) How can the general public, third sector actors and vested interests be motivated to support reforms towards a new growth path?

Policies need to take into account the specific bounded rationality and social interaction that characterizes stakeholders, such as the role of: intrinsic next to extrinsic motivations, status and image in consumer purchased of environmentally relevant goods and services, different types of norms in creating opportunities for environmentally beneficial behaviours to spread through social groups, framing in communication of information (e.g., about climate change), and the impact of commercial advertising.

2.2.1 Contribution to Central Question 1

Most members in Area 2 feel that Question 1 has an insufficiently open formulation to allow for relevant and exciting research. It takes for granted that world growth will be possible while at the same time reducing seriously energy (and certain material) inputs. The question is immediately: how can we increase our share in world growth. This denies that there may be a conflict between growth and environment. The answer to question 1 is very likely NO because the mentioned reductions in energy (or better energy causing serious emissions of greenhouse gases) will be far less under a scenario of world growth than what is required for a sustainable path. Based on the literature we have estimated the reduction requirement for reaching a safe concentration of CO₂ in the atmosphere, namely the IPCC 450 ppm goal, i.e. no more than 2°C increase of the global average temperature. This requirement is 82% (annually 4.5%) emission

reduction until 2050, if per capita GDP increases by 1.5%. Even with zero economic growth, still an impressive 67% intensity reduction (3% per year) is needed. These reductions are net of all kinds of undesirable indirect effects (often called rebound). They represent unprecedented challenges, which illustrate the potential conflict between growth and environment, or growth being a risky strategy from an environmental angle. This suggests that the policy priority given in rich countries to growth in effect means putting little weight on environmental issues in policy. Talking about sustainable or green growth is just paying lip service to the environment if one is unable to clarify how the challenge of reducing CO₂ emissions with 82 % until 2050 is feasible.

For this reason, employment (or reducing unemployment), equity and environment are (or should be) the goals to focus on for politics and research. This is moreover a more correct welfare (or well-being) approach, as follows from the survey of well-being indicators by Kettner, Köppl and Stagl (2012), Growth is at best a means, but perhaps not even longer so given all kinds of seriously constraining conditions: sharply rising energy prices because of peak oil as well as the need for stringent climate policy in the form of carbon pricing; underestimating the importance of energy for past growth which suggest it is very difficult to substitute away from high energy use. Together, the two previous constraints mean a sharply rising cost of production and thus less growth. Moreover, past growth has been partly due to financial and housing market bubbles. One should further take into account diminishing returns to technology, and aging populations in many European countries. We should add that in the case of the current crisis, with some south-European countries having unemployment rates of above 20 %, it will be difficult to recover employment without growth. But it should be realized that the project is not strictly focused on, or limited to, the current crisis context. It studies a more general (non-crisis) context in which unemployment percentages are generally much lower. Then there is more room for policies that protect employment and the environment without requiring necessarily high growth. In this case one effectively needs to not only decouple environmental pressure but also employment from income growth. This twofold strategy can be seen as sort of precautionary. For clarity's sake, it certainly is not meant to be an anti-growth (zero- or degrowth) strategy, as growth is not the direct focus but instead environment and employment.⁵

Many authors argue that we are at a breaking point in terms of energy, climate change and the economy. Treating environmental issues rather separately from employment issues has been the strategy of macroeconomics and economic politics/policy. Talking easily about sustainable growth continues this line of thinking and avoids accepting, and struggling with, the enormous challenge discussed above. Macroeconomics seems to be overwhelmed by the current economic-financial problems – understandably – and is dominated by internal debates about the best explanations, theories and models. The mainstream debate is about pure economics, neglecting environmental and energy factors, because the economic-financial issues by themselves create already so much food for thought and debate. It is further motivated by the widespread belief that absolute delinking of growth and environmental pressure – or

⁵ Ongoing research in Area 2, notably using different types of models, may provide more insight into to what extent and under which external and policy conditions decoupling of environment/growth and employment/growth is feasible.

euphemistically “green growth” – is feasible. It assumes, not proves, that we do not have to worry whatsoever about growth – growth is seen as entirely unproblematic. One can wonder whether this is good science: there is no evidence in the form of empirical studies (notably in environmental economics) that green growth is possible, let alone easy. It is not enough to point at some decoupling for less problematic environmental substances. Green growth requires decoupling in all environmental dimensions, which is an unprecedented challenge.

Some optimists may point at the research on environmental Kuznets curves (EKC), but its results rightly summarized indicate that no delinking has occurred for serious environmental issues (global warming, biodiversity loss). EKCs have only been found for a subset of environmental indicators, mainly related to partial, local, short-term and flow issues. Often these involve problems associated with human health as this is the understandable immediate concern of voters and politicians (e.g., water quality and emissions of particulate matter in cities). Moreover, diminishing returns are found for other problems (e.g., acid rain was rather successful but reappears with continued growth). Finally, the EKC research is typically partial in nature, and does not take into account the shifting of environmental problems. This is perhaps not immediately a reason to become pessimistic but it should seed some sentiment of precaution about what growth and policy can accomplish. It is also good to realize that the policy challenge is unheard of: for example, various studies argue that the improvement in net carbon efficiency – including all types of feedback known as rebound – (average Dollar or Euro value per unit of CO₂ emitted in the global economy) should increase with at least 60 % to even more than 99% in the coming decades – depending on the particular scenario for global population and income growth – to realize the 450 ppm IPCC goal for atmospheric CO₂ concentration (consistent with no more a two degrees Celcius rise of the global average temperature). For this reason, one milestone has carefully looked at the past evidence and future scenarios. So the challenge is enormous, and we feel that effective integrated economic-environmental analysis of the grand challenges (employment versus environmental sustainability) can still be improved in the WWWforEurope project, notably in Areas 1, 3 and 4, and to a lesser extent 2 and 5.

In Area 2 we try to address some of the barriers to a sustainability transition from the perspectives of macroeconomics, innovation studies, transition studies and behavioural economics, integrated with environmental economics and policy analysis.

Kettner, Köppl and Stagl (2012) present a list of well-being indicators and indicator systems which go beyond the narrow concepts of national economic accounts. The indicator list is the result of a review of suitable dimensions of well-being and sustainability with the aim of expanding the macroeconomic analysis by important dimensions so as to be useful for transition policy advice. Where appropriate, indicators differentiated by men and women will be developed. The pool presented in this deliverable includes: Indicator Systems, Composite Indices and NAMEA and Material flow accounts. Some of the indicators will be included in the macro-economic models in order to account for key dimensions of sustainability. This work forms a basis for more comprehensive representations of the social and ecological dimension in macro-economic models. This may lead to a better understanding of synergies as well as conflicts between sustainability and economic growth.

MS36 finds that the past four decades saw the EU's energy and material input stagnating while economic growth continued. So there was a relative decoupling of income for some environmental indicators. An absolute reduction of environmental pressures, and therefore absolute decoupling, occurred only in the UK and Germany. The "freeze scenario" of European resource use is almost identical with the trend scenario. With regard to the transformation scenario that would require a halving of resource use, there is no precedence for concluding on economic growth. According to the projections and scenarios reviewed, it seems that Europe would fare best by adjusting to low economic growth anyway. The linkage between the population's wellbeing and resource use is weak – but the preservation (or even improvement) of wellbeing would be a matter of resolving distributional challenges.

The position paper suggested in the introduction (Antal and van den Bergh, 2013) suggests further that next to mainstream economics (which failed in predicting and so far solving the crisis) heterodox perspectives deserve serious attention, notably those that try to realize welfare, employment and environmental conservation without relying on continued average income growth. The reason is that no view or idea should be excluded in an open research project that aims to tackle these huge challenges. An unprecedented level of creativity and lateral thinking are needed to come up with credible solutions to the interlinked problems of unemployment, inequity and environmental risks. To deal well with this issue, relevant indicators of environment and social welfare are needed, as discussed above.

Another view of course is that we know the solutions already (see the answer to question 4), but that the problem is one of social-political acceptability. The task for us scientists is then explaining well the reasons to implement recommended policies, showing their overall positive and negative socioeconomic effects and arguing that the first are worth the latter.

It should be noted that question 1 has another element next to the conflict between growth and environment. Namely, the formulation "participate more strongly" may in general be difficult if it is recognized that poor countries can (and have the right to) catch up in growth. For this means that the rich countries together will face a falling share in world growth, for an extended period of time, that is, until the others have caught up (if that ever happens). It is likely that rich countries, including Europe, will be faced with a continuously falling share in world growth if the poorer part of the world continues to catch up and narrow the income gap between rich and poor. In fact, if the rich countries would manage to keep their share in world growth constant this would mean that the poor countries would not catch up.

2.2.2 Contribution to Central Question 2

(Area 2 did not work much on this issue. Note, by the way, that "such a growth strategy" assumes that growth and sustainability can be combined, i.e. question 1 has a positive answer, while here it was argued above that a negative answer is more reasonable.)

Fischer-Kowalski et al. (2013) finds that reducing resource use will not threaten regional cohesion as it is a matter of rising world market resource prices acting as an incentive to improving resource productivity. There will rather be convergence of economic (and possibly environmental) performance of regions. Policy and strategic responses will of course create

winners and losers in any region. This suggests that additional policies are needed to deal with the resulting inequity.

2.2.3 Contribution to Central Question 3

Given the ambitious goal of carbon dioxide emissions reduction of 82% (annually 4.5%) until 2050 under per capita GDP growth of 1.5 % annually – as mentioned in the answer under question 1 – it is clear that achieving this requires radical innovation and transitions in energy, food and transport systems, manufacturing and service industries. Only a sophisticated policy package including any possible instrument to stimulate the needed innovations can realize the foregoing goal.

Many important environmental innovations are factor-saving, not output-quality improving, implying that innovative technology is more expensive but does not provide relevant new features to users, which evidently hampers diffusion. For these various reasons direct technological support in the form of subsidies to R&D and diffusion/adoption is needed for some time.

Perhaps the most important policy is shifting taxes from labour to environment (energy/materials). This will not just have short-term (“static”) but important long-term (dynamic) effects, namely by fundamentally altering the incentives for innovation. A serious shift in taxes will discourage labour-saving innovations (as labour becomes cheaper or relatively cheap in comparison with the production factor environment) and encourage environment-saving innovation (as materials and energy will become more expensive). To make this policy sufficiently effective it should evidently involve a considerable shift in taxes, ideally perhaps eliminating all labour taxes except those levied beyond a threshold income level for equity reasons, and those needed to guarantee a minimum tax revenue.

As discussed in Gazheli, Antal and van den Bergh (2012), the behaviour of various actors is important to understand the success of innovations, from inception to widespread diffusion. Transition policy needs though to account for the bounded rationality and social interaction of agents so as to arrive at a realistic view of the limits and opportunities for realizing a transition. So far, writings on sustainability transitions have not paid so much attention to this. We provide concrete examples about the role of learning and behavior underlying innovation. We argue that the importance of pricing of environmental externalities for stimulating the right tempo and direction of innovation is underestimated – in the traditional field of innovation studies as well as in the more recent field of transition studies. Correct prices not only stimulate right choices by consumers and producers with given technology but also stimulate better choice in complex innovation processes as all the prices information about resources, labor, capital for different opportunities reflects better the real social costs including environmental externalities. Promising technologies are still expensive and need direct support.

Gazheli, Antal and van den Bergh (2013) present policy package for innovation at three levels, which suggests that any policy has an innovation impact and therefore should be rightly set or defined. The three levels derive from transitions theory and concrete policies are as follows (mentioned for each level in between brackets): niche (creation of network interactions, local experiments, subsidies or price guarantees for expansion), regime (regulating of dirty activities,

escaping of lock-in, limiting the political and economic power of regimes, enhancing technical and resource diversity), and landscape (promotion of civic debate, information provision, policy integration).

According to Fischer-Kowalski et al. (2013), if Europe takes its climate policies seriously and coherently shifts away from fossil fuels, this alone will reduce material resource use drastically as solar, wind and water power energy generation, once installed, requires only very few resources (while currently fossil fuels amount to one quarter to one third of all material resources, plus substantial resource use for transportation and supply infrastructures). The second most powerful strategy would be densification of urban settlements and reduction of urban sprawl. This would save resources in infrastructure investments, in energy use for heating and transportation and in construction – but admittedly also has disadvantages in terms of well-being, congestion and health. Finally, a reduction of animal based food could contribute to health, saving resources and climate protection.

With regard to the bounded rationality and other-regarding preferences, some illustrations can be given which are relevant for policy design: people have been found to discount more strongly in contexts of environmental impacts, like investing in renewable energy or energy conservation equipment, than in a purely financial context; investors overestimate the probabilities of certain outcomes (and their own ability to predict these outcomes) which can make regulatory intervention necessary to reduce resulting cyclicity in the economy; perception of potential losses and gains determine people's choices in risky situations, not expected utility, which is crucial in dealing with transitions of complex systems where uncertainties abound; finally, risk puzzles (investment in stocks versus bonds) and risk aversion in relation to long run investments play an important role in the success of risky sustainability projects. More generally, financing via capital markets invites for myopic firm behavior because of short pay-back times required.

To shift attention in fundamental and applied research to radical new technologies that are critical for reducing environmental pressure, various changes are needed. Above all, all prices in the economy should reflect resource scarcity and environmental impact, so that all decisions, including those related to R&D and innovation, will almost automatically be (re-)directed at reducing their (unwanted) use in any part of the economic system. This suggests an important role for environmental taxation, notably carbon taxes (or alternatively tradable carbon permits). This fits with the idea that firm innovations are very much driven by information about prices and costs of existing and alternative materials, products and technologies.

A shift from commercial innovations to environmentally necessary innovations – combining their logic in fact – will be further require not just implementing environmental taxes, but a large-scale shift in taxes from labour to energy and materials, as explained already above. As a third policy, public expenditures have to be increased to support both environment-related university research and R&D by firms into still expensive but environmentally-promising options. Whatever specific instrument is used in the latter case, it will ultimately come down to a form of public subsidies, i.e. shifting money to public and private research into options that currently have a low market rate of return and long payback period, meaning that they are not profitable without public support and therefore receive too little investment.

It should be noted that Area 3 is very much focused on this particular research question, as it combines much expertise on environmental innovations. It adopts firm-oriented, business-management and industrial perspective, whereas Area 2 is particularly interested in systemic aspects of environmental innovation and macroeconomic features of a sustainability transition. In addition, Area 2 research shows a strong public policy dimension. So far, it seems the two areas do not arrive at conflicting insights, which is not surprising as they are quite complementary in approach and focus. In other words, their insights can be easily combined.

2.2.4 Contribution to Central Question 4

Gazheli, Antal and van den Bergh (2013) consider all the stakeholders identified and discussed in Gazheli, Antal and van den Bergh (2012), and their role in the different stages of a sustainability transition, as well as matching their behavioral features to policies. This leads to an assessment of potential or expected responses of policy to a range of policies and policy instruments. The analysis resulted in the proposal of a policy mix (or package) to guide a sustainability transition, involving innovation, regulatory, information provision and other policies. Because of the detailed tables involved it is difficult to summarize the findings. Following the Multi-Level Perspective framework to conceptualize sustainability transitions, we classify the various transition policies at niche, regime and landscape levels. Next, we offer a complementary classification of policies based on a distinction between social preferences and bounded rationality.

Transition policy is generally seen as the stimulation and management of learning processes, and creating awareness to keep opportunities and options open to increase the flexibility and adaptation capacity of social and technological systems. It requires a multi-actor and multi-domain approach with explicitly formulated long term policy goals, which implies that one should pay attention to the potential friction between various goals supported by different stakeholders. Policy formulation is not easy and partly subjective or trial-and-error (but unfortunately learning is slow with long term goals). There is no generally agreed upon transition end goal, and neither is there a common social welfare function. Linked to this, also problematic is that political groups have very different implicit social welfare functions – in terms of performance on economic, environmental and equity issues. And if policy makers and politicians agree on policies to be implemented, still many different types of policy failures are possible. These can be related to the process of policy design and implementation of policies.

To further clarify the above mentioned policy mix: This is needed to in any case deal with two types of challenges, namely a triple externality problem (environment, knowledge/technology and lock-in), and four escape routes (carbon leakages, energy rebound, shifting of environmental problems and green paradox). For this purpose, a combination of environmental regulation and technological support is essential, but in a particular way (with particular instruments, design and timing). Pricing of externalities is needed to avoid serious energy/carbon rebound. Several other instruments, such as information provision, eco-labelling and technical standards, run the risk of allowing for too much of such rebound. Attention is needed for regulation of commercial marketing of carbon-intensive products and services. The lack of economic rationale of a sustainability transition (logical only from an environmental but

not an economic angle) should be addressed, notably recognizing that it is not economically attractive to make a transition to less concentrated or lower EROEI (energy return on energy investment) technologies like renewable energy sources. Note that past energy transitions brought many economic benefits which is not the case for the perceived transition to renewable energy (it will create employment, but this just means energy will become more labour-intensive and expensive, at the cost of economic production and profitability in the rest of the economy).

Table 3 Policy challenges illustrated for a transition to sustainable energy

Challenges		Effective policies and strategies
(a) Triple externality problem	(a1) Negative, environmental externality, which means that prices do not reflect social (private + external) costs, thus providing incorrect incentives for consumption, production, investment and innovation.	Private decisions (by firms, households, investors and innovators) need to account for external costs throughout the life cycle of products and services (e.g., carbon pricing) Environmentally harmful subsidies need to be removed
	(a2) Innovation/knowledge externality (positive) causing the investor in innovation activity to not always be able to reap a fair share of the innovation benefits. An uncertain and long-term return on investment in innovation is characteristic of many environmentally-relevant innovations.	Protect innovators so they can reap the benefits of their investments (e.g., patent law) Subsidize promising but still expensive technologies. Basic research with low return on investment by the state (universities and state research institutes).
	(a3) Lock-in, which means a positive externality for the dominant technology, and a negative externality for new, niche technologies.	Discourage innovation in the dirty technology, subsidize set-up costs and infrastructure of cleaner alternatives, restrict advertising of dirty locked-in product, and employ status seeking to sell cleaner alternative (e.g., electric car).
(b) Escape routes: indirect, undesirable and avoidable effects of well-intended policies and strategies	(b1) Carbon leakage due to relocation of polluters to countries with lax environmental regulation and associated changes in trade patterns	International climate agreement
	(b2) Energy or CO ₂ rebound: indirect effects of energy conservation that create new energy use	A hard ceiling to total CO ₂ emissions. Carbon pricing. Combination means tradable permits are an effective policy.
	(b3) Environmental rebound: shifting of environmental problems	Complete systems analysis of sustainability policies and renewable energy strategies to identify unwanted indirect effects.
	(b4) Green paradox: oil market response to climate/innovation policies.	Externality pricing of fossil fuels (supply policy).
(c) Lack of economic rationale of a sustainable energy transition	(c1) Transition to less concentrated or lower EROEI (energy return on energy investment) technologies is environmentally motivated but lacks economic logic. Therefore it cannot be compared with historical energy transitions.	Improve EROEI of technologies by R&D incentives and public investments. Subsidize niche technology. Feed-in-tariffs for renewable electricity.
	(c2) Environmental innovations are generally factor-saving, not output-quality improving. This means that while innovative technology is more expensive it does not provide relevant new features for users. Diffusion is hampered then.	Try to combine function/quality and factor-saving innovations. Make consumers and producers more conscious about environmental impacts (voluntary action, altruism). Subsidize niche technology.
(d) The financial-economic crisis creates new barriers to energy transition, notably in terms of reduced public support of, and investment funds for, renewable energy and energy conservation.		Integrate macroeconomic policies with environmental and innovation policies. Show that energy transition can go along with economic recovery. Prepare society and politics for a lower rate of economic growth.

Source: J.C.J.M. van den Bergh (2013)

Next, the economic crisis poses particular challenges, as private and public support of renewable energy has become less popular. Governments should do an extra effort and not use the crisis as an excuse to not invest in our common future. These are long-term investments with a long-term return, which makes governments the most logical leaders since private actors will be less patient and more myopic (this has adequately been called a “new green deal”). Table 3 provides a good summary of the different challenges and concrete instruments/measures for a transition policy.

Finally, the preoccupation of politics and society with growth should be tempered through careful reconsideration, public debate, and information provision, since growth is no panacea for the conflicting problems of our time, and in certain cases rather acts as a barrier to solving these. To accomplish the insights from Kettner, Köppl and Stagl (2012) are relevant for policy as the presented list of well-being indicators and indicator systems goes beyond the narrow concepts of national economic accounts. This work forms a basis for more a comprehensive representations of the social and ecological dimension in macro-economic modelling and policy making. This may lead to a better understanding of synergies as well as conflicts between sustainability and economic growth. Moreover, the specific indicators listed have in common that data are available for one or more EU countries.

2.2.5 Contribution to Central Question 5

(Note that “a new growth path” assumes that growth and sustainability can be combined, i.e. question 1 has a positive answer, while here it was argued that a negative answer is more reasonable. In addition, note that “new growth” is an unscientific, even somewhat populist term. One cannot find serious scientific publications about it. This makes it an unattractive term in the core research questions that are aimed to drive the research.)

Policies need to take into account the specific bounded rationality and social interaction that characterizes stakeholders. This was addressed in Gazheli, Antal and van den Bergh (2012), from which we select some insights: First is the finding that altruism and reputational concerns stemming from intrinsic motivations can be discouraged by extrinsic motivations like rewards or punishments. The dilemma here is, however, that without extrinsic motivation we cannot expect any significant change in the pollutive behaviour of consumers and producers alike. Next, it is important to account in policy for the behavioural feature that consumers are often much more concerned about status and image than about environmental performance of purchased goods and services. This suggests that status feelings have to be redirected to environmentally well performing alternatives. Next, creating opportunities for environmentally beneficial behaviors to spread through social groups is important to facilitate transitions. In the case of energy saving, for example, norms can sometimes be more powerful than information provision. The difference between descriptive norms (dominant behaviours) and injunctive norms (approved or disapproved behaviours in a particular society) is relevant (by the way, also for the answer to question 4). If the aim is to change behavior, focusing on injunctive norms is the appropriate strategy. If, on the other hand, the goal is to prevent negative behavior, both injunctive and descriptive norms can be used in persuasive messages. In addition, more on the bounded rationality than social interaction side, to develop more sustainable habits, the emotional

appraisal of consumer activities has to change. Last but not least, the role of framing in communication of information (e.g., about climate change), but also in the provision of product information (and the generally more problematic role of commercial marketing) deserve more attention. There is a lot known now from experiments with differently framed messages. The milestone also discusses the relevance of gender, such as difference in risk perception between men and women which is relevant for environmental decision-making (consumers and producers), and the need for mixed composition of research teams on environmental innovation.

Note that this question is also addressed by Area 1, which focuses the attention on reform of the Welfare State. It overlaps and adds a little to our research, by giving attention to not only questions of optimal design of social policies but also the problem of social-political feasibility. In this context it addresses the particular question of how can the general public, third sector actors and vested interests be motivated to support reforms, which is answered by both theoretical reasoning and empirical analysis. Results recognize the importance of selfishness as well as attitudes and preference formation, particularly regarding procedural fairness, for public support given to policies. So far, Area 1, however, focuses on social policies and does not deal with environmental policies. Evidently, the relevance of social-political feasibility of environmental policies is large – witness an emerging literature with empirical and experimental studies on this.

2.2.6 Abstracts of relevant milestones and deliverables

See Annex 1.

2.3 Contribution of Area 3

David Bailey (ASTON), Jürgen Janger (WIFO)

Europe faces several important challenges, among them both to increase growth from current very low levels and to make this growth compatible with environmental sustainability and social inclusiveness. Area 3 contains research papers which try to look at ways to accelerate growth in a sustainably way, achieving a socio-ecological transition. As such, area 3 attempts at redefining competitiveness understood as the ability of countries to achieve an ecologically sustainable and socially inclusive growth. This implies that on the one hand, it analyses the drivers of growth, specifically innovation and research, and policy fields which impact on growth drivers, i.e. innovation policy and industrial policy. It looks at some longstanding European growth bottlenecks, such as entrepreneurial dynamics vis-à-vis the US and the science base for innovation. On the other hand, area 3 investigates ways to shift Europe from the current growth path to a new one with greater social inclusiveness and more ecological awareness.

In so doing, Area 3 recognizes that innovation has various dimensions. From an analytical perspective, with respect to factor inputs, innovation has been traditionally analysed as potentially being labour saving, capital saving or neutral. Little attention, however, has been devoted thus far to the question of how to make innovations labour saving, capital saving, energy/resource saving, or other inputs saving, depending on the explicit structure of the

production/cost function. From a policy perspective, and related to the aforementioned dimension of innovation, it can follow current and future market forces, or it can be shaped by societal needs, e.g. health, culture, ecology or social inclusiveness. Governments intervene strongly in the innovation sector since private benefits are lower than public benefits due to the public good character of new knowledge. But it also makes sense that such governmental interventions should work as well in favour of future goals and systemic change. If the costs of environmental damages, climate change or scarcity of resources are underestimated in private decisions, innovation policy should use its leverage to encourage their inclusion.

The expected result of the work done in this work area is (i) a vision of an innovation system, accelerating the socio-ecological transition, and (ii) a concept of a systemic industrial and innovation policy consistent with and promoting a broader bundle of economic objectives including income growth, employment dynamics, social inclusion, and environmental leadership. Technical progress should help to promote social inclusion, cope pro-actively with future problems (health and ageing) and deeply reduce energy and raw material inputs.

As with other Area summaries, this Area 3 summary presents results from the first one and half years of research in the different work packages of area 3 of the WWForEurope project. The aim of this first phase of the project (the 'analytical stage' of the project) – as with other areas - is to provide a solid theoretical, conceptual and empirical background for policy analysis and recommendations which will follow in the second stage of the project.

We first present a summary of the contribution of area 3 to the central questions before we go into more detail, in particular as regards central question 3.

Short summary of contribution to central questions

Our area focuses on CQ3, “How can social and technological innovations be supported (and the focus of technological trends be shifted) so that they contribute to social and ecological sustainability?” We understand it to relate to two dimensions: first, as an analytic endeavour, is it possible to boost (green) innovations while at the same time aiming at rising employment and social goals? Which factors drive such innovations? Second, as a policy related endeavour, area 3 looks at both accelerating the rate of innovation and at shifting the focus of innovative activity to enabling the socio-ecological transition.

CQ 1 is related to CQ3: “Can the EU at the same time participate more strongly in world growth, guarantee a maximum well-being of its population and reduce energy and material input?” In fact, our area provides some elements of an answer to CQ1, so that our research is also relevant for CQ1. Regarding CQ2, 4 and 5, these are not the main focus of our area, but the research in some of the papers is relevant for them.

2.3.1 Contribution to Central Question 3

Out of the five central questions, area 3's research is particularly addressed at question 3, or how social and technological innovations can be supported (and the focus of technological trends be shifted) so that they contribute to social and ecological sustainability. In line with the major research questions of the project, we understand this question to refer to two related dimensions.

First, there is an analytic dimension regarding the compatibility of innovation in general and green, or eco-innovations in particular with inclusive growth, as resource-saving innovation may also be labour-saving. Moreover, there is the question of the determinants of innovation and in particular green and social innovations, or of the drivers of the kind of innovations we would like to see emerge more often within a new growth path.

Second, there is a policy dimension, again to be viewed from two angles: how to increase the rate of innovations, i.e. how to accelerate them and make them more radical; and how to shift the direction of innovation towards environmental sustainability and social inclusiveness. How can innovations be made less labour-saving and more resource-saving? How can the “bias” of technological change be shifted?

These analytic and policy dimensions frame area 3’s contribution to the overall project. In the following, we summarise the papers produced so far according to this framework.

Analysis: Linkages between innovation, employment and environment

Is increased innovation performance compatible with rising employment? Is a focus on green innovations to the detriment of other goals of the project? Several papers discuss this question at varying levels of aggregation, from the country to the firm level. This is of course also crucial for policymaking and very relevant for the project’s first central question of knowing whether in principle growth is compatible with the environment and limited resources.

For example, Aiginger, Bärenthaler-Sieber and Vogel (2013) redefine competitiveness as the ability of a country to provide beyond GDP-goals, thus extending a focus on cost or on productivity alone to a broader spectrum of goals including social inclusiveness and environmental sustainability. They provide an input-oriented evaluation of competitiveness (focusing on unit labor costs, industrial structure and capabilities) as well as an outcome oriented approach, which makes it possible to compare European countries according to their new measure of competitiveness. In a nutshell, they show that higher social and environmental sustainability can go hand in hand with higher economic performance, pointing to the feasibility of a new high road growth path.

In more detail, the authors aim at providing a comprehensive evaluation of the measurement and determinants of competitiveness. The authors develop a definition of competitiveness with the intention of using it to monitor the process of transition to a more dynamic, social inclusive and ecologically ambitious economy. Of particular note, in the context of the WWWforEurope project, they define competitiveness as the “ability of a country (region, location) to deliver beyond-GDP goals for its citizens”. The authors apply this competitiveness definition to assess the post-crisis competitiveness of European countries using both individual indicators and a composite indicator on outcome competitiveness under new perspectives which is based on 3 pillars, namely an income, a social and an ecological pillar. They compare the results to traditional output competitiveness (assessing incomes per head and employment only) and use factor analysis as well as econometrics to test the results. For a subset of indicators they are able to compare European performance to that of US, Japan and Switzerland. The results presented suggest that transition dynamics can be measured by the proposed set of indicators

and that it does indeed make sense to define competitiveness as the ability to provide beyond GDP goals. By attempting to establish empirically which factors contribute to outcome competitiveness – measured by combining indicators on economic performance, social inclusion and ecological sustainability into one composite indicator – the paper sheds some light on the question whether increased economic performance, driven by innovation, is compatible with a new growth path.

While Aiginger et al., (2013) place their analysis at the country level, the empirical data built at the regional/cluster level by Ketels and Protsiv (2013) across EU regions indicates that there is no fundamental trade-off between the narrow economic objectives measured by GDP per capita and the broader objectives associated with the New Growth Path. However, it also indicates that these two sets of objectives do not automatically move in parallel in the process of economic development; higher GDP can easily lead to higher environmental costs and potentially social issues. The key challenge for policy makers, then, is to identify what measures are needed to actively align these two sets of objectives.

The paper by Licht and Peters (2013) uses firm level data to show that environmental innovation (e.g. induced by industrial policies to reduce environmental impact of production and consumption) might not face trade-offs with regard to the competitiveness of firms in terms of their ability to generate jobs. Especially for countries close to the productivity frontier, employment growth might more and more depend on the ability of firms to develop and introduce new eco-friendly products. Hence, there might be room for a growth path which combines both employment growth and lower environmental burden.

In more detail, the authors define the scope of ecological innovations and their employment effects by exploiting data from the Community Innovation Surveys for different EU member states; a companion paper looks at Germany only. In particular, they compare the employment impact of product and process innovation with and without specific environmental characteristics. Hence, the paper contributes to the discussion of impacts of green innovation on employment growth in Europe. The question how innovation affects employment is non-trivial since various channels exist through which different kinds of innovation may destroy existing jobs (displacement effects) or may create new jobs (compensation effects). In general, the majority of empirical studies find an employment-stimulating effect of product innovation whereas the effect of process innovation is ambiguous ranging from significantly negative to positive.

Overall, the results show that the general productivity trend had a strong negative impact on employment growth. More surprisingly, specific process innovations both with and without environmental-friendly characteristics only have a minor impact beyond the general productivity trend. The general growth in output (e.g. linked to business cycle) had the biggest impact on employment growth.

The paper notes that environmental process innovations, e.g. caused by country-specific environmental regulation policies, in all countries have either none or only a minor impact on employment beyond the general country-specific productivity trend. Hence, the results by Licht and Peters (2013) do not point towards the often feared negative employment consequences of

environmental policies affecting production processes. In addition, product innovations were a significant driver of employment growth in all countries and this also related to environmental-friendly product innovations. In manufacturing in some countries (e.g. Germany, Slovakia, Czech Republic) the employment impact of new products with environmental-friendly characteristics even outperforms the employment impact of new products without environmental-friendly characteristics.

On the social dimension, Friesenbichler (2013) finds an energy transition to be non-Pareto efficient (capital stock becomes partly obsolete, re-financing of subsidies, higher prices for electricity); i.e. there is a trade-off between social and ecological objectives.

Our research at different levels of analysis indicates so far, that accelerated innovation, e.g. also targeted at ecological solutions, may well be compatible with new economic dynamics [growth path] which does not sacrifice environmental and social goals for higher incomes. However, ecological goals may actually conflict sometimes with social goals. Before we turn to policies, we first need to know which factors drive innovations. Of course, there is already a substantial literature built up in this field, but area 3 makes some interesting additions to this literature.

Analysis: determinants of innovation likely to foster ecological and social goals

Several papers shed a closer look on the determinants of innovations which could drive a new growth path. They examine the contribution of SMEs and young firms to innovation in the energy sector, the contribution of open innovation and other factors to the emergence of new industries, the determinants of Greenfield investment in intangible assets and the role of technological platforms in enhancing the integration of green technologies.

Aschhoff et al. (2013) examine the potential contribution of SMEs and young firms to inventive activity in the sectors of energy and renewable sources, using patent data with a special focus on Germany. Their results suggest that first of all, young and small firms might not be able to drive the technology development towards a more sophisticated use of energy resources and renewable energies. According to them, like in most other fields of technology the direction of technical change is determined by established large firms. Hence, under the current framework of innovation and industrial policies, the development of the “more entrepreneurial economy” will probably not form forerunners on the ways towards a new growth path. In the comparison with the US, this is actually a positive finding for Europe’s ambitions to initiate a new growth path, as firm growth dynamics in particular of young, innovative firms are usually found to lag behind the US. However, the findings need to be interpreted with care, as they only relate to one country.

Amison and Bailey (2013) explore the links between open innovation and the emergence of a phoenix industry – the low carbon vehicles sector - in the UK’s traditional automotive heartland, focusing on the West Midlands region. It highlights three major factors in driving the development of this ‘phoenix’, “new-growth-path” industry at a regional level. Firstly, it highlights the role of ‘open innovation’ approaches in driving the sector, for example noting that smaller firms can sometimes innovate more quickly/more cheaply than the major auto firms; the increased interaction across technologies, up and down supply chains and between larger and

smaller firms. It also notes the role of hybrid firms providing services, plus prototyping/low volume manufacturing (largely in niche vehicles) and the transferability of these competences across industrial sectors. Secondly, it points to the role of historic (and relatively immobile) investments in the region, for example the past/ongoing importance of established mass producers, the depth of skills and experience in suppliers and in the local workforce; and cross-overs with the overlapping motorsport cluster. Finally, it stresses the role of public-private sector cooperation, such as: the establishment of the Automotive Council UK and its work in developing technology roadmaps, informing regulation, and supporting development of the UK supply chain (a type of industrial policy as a discovery process and in line with 'smart specialisation' principles); the R&D funding programmes developed with industry input; and the earlier role of the Regional Development Agency. Overall, it points to the possibilities of building smart specialisation strategies and industrial policies driving innovations which are aligned with high-road strategies (in line with Ketels and Protsiv, 2013).

Falk (2013) empirically analyses the determinants of greenfield investment in intangible assets in emerging and industrialized countries. Intangible assets (i.e. software, R&D, organizational capital) are non-monetary assets without physical substance and with low energy consumption and low carbon emission. Higher investments in knowledge intensive activities, such as intangible assets, are essential for making progress in the implementation of Europe's 2020 strategy for smart, sustainable and inclusive growth. Hence, knowledge about the factors influencing the level of international investments in intangible assets is helpful to develop the formulation of effective policies to enhance investment in these areas. Improving the quality and quantity of skilled labour, decreasing firm entry regulation costs (in particular in Southern European countries), further investment in broadband infrastructure and better investment protection systems are the main factors in driving investment in intangible assets.

De Propriis and Corradini (2013) look at the presence and determinants of technological platforms, defined as "knowledge and scientific launching pads that spin out of key enabling technologies", across EU Countries, and explore the mechanisms through which these influence inter-sectoral technology spillovers, thus fostering technological shifts and technological synthesis within the broader economy. They model the systemic nature of technology platforms using patent and patent citation data from the European Patent Office (EPO). In particular, the paper provides empirical evidence that the presence of key enabling technologies at the base of the platform may lead to a more sustained interaction across second tier innovations characterised by a "distant" knowledge base. Drivers of innovation are formulated on three levels. Firstly, De Propriis and Corradini (2013) confirm what has been found in previous studies; that is, the higher level of originality and generality of patents developed by universities and governmental not-for-profit organisations. More interestingly, they show that the crucial role they play in terms of technological synthesis and radical innovation lies in their higher propensity to effectively adopt and use enabling technologies within their innovation activity. For this reason, the paper suggests that publicly funded research may play a key role in driving radical innovation, acting as a boundary-spanner in connecting, translating and integrating different technological knowledge. Secondly, from the most complete EU-wide patent database, the paper has been able to derive what are those technologies that can be

intrinsically defined as 'enabling technologies'. These technologies are able to generate a spawning of patents spreading across different technological fields and for this reason they act as enabling technology with the potentials to enhance the innovative capacity of other sectors. Finally, the paper has singled out patents related to green technologies, providing a map of the EU regions and technological sectors strongly related to them. Hence, they have offered empirical evidence that technological platforms may enhance the integration of green technologies within innovations across related and unrelated technological classes.

Policies: Accelerating and shifting the focus of innovation to contribute to ecological sustainability

Which policies can foster the transition to a new growth path, to a redefined notion of competitiveness? Although this question is the focus of the second half of the project, some papers already include research which is relevant here. We examine two different sets of policies in turn, first policies which basically aim at accelerating innovation and second policies which more specifically aim to shift the focus of innovative activity towards goals in line with the new growth path.

As regards accelerating innovation, the available papers investigate academic research as an area where Europe substantially lags behind the US and where reforms to universities and academic careers could make a big difference, boosting innovation through various links; furthermore, they investigate social innovation and how overall innovation performance could be strengthened by adapting national innovation systems to the level of development of each European country.

Janger and Nowotny (2013) as well as Janger, Strauss and Campbell (2013) examine the contribution of basic (academic) research to smart, inclusive and sustainable growth. In essence, they find that: high quality academic research increasingly matters for firm innovation in Europe and also for solving societal challenges; that Europe lags behind the US in academic research quality; and that options to increase research quality should consider improving the attractiveness of academic careers in Europe, and the reform of higher education systems. High academic research quality is being seen as increasingly becoming an ever more important growth driver, as i) firm innovative activity is more and more science-based and as ii) high quality peers attract the best students and researchers from all over the world, which provides for a stream of highly qualified graduates working not only in academia but also in firm R&D labs. Moreover, high quality academic research has been shown to be conducive to spin-offs. So improving Europe's universities' research quality would contribute to growth via 3 important channels: i) business-science links in the form of research cooperation e.g., ii) graduates and iii) spin-offs. At the same time, excellent research is also a precondition for solving many of our 'grand challenges' such as climate change. Indeed, without universities which are able to operate at the frontier on a level par with the US, it is difficult to imagine a sustainable European growth and competitiveness model. Shifting R&D and innovative activity to new aims such as climate change can only be promising when the underlying quality of research efforts is as good as it can be. More policy-oriented work will follow in the second stage of the project.

The paper by Janger and Nowotny (2013) is also relevant for gender issues. Comparing job choices between female and male researchers, the authors find some significant differences between women and men: for example, they find that salary is more important for male researchers, whereas female researchers place more weight on other aspects of the remuneration package such as health care, old-age pension coverage or fringe benefits like childcare facilities. They authors also find female researchers to have a higher preference for working together with high-quality peers. Furthermore, differences between males and females can be found relating to the availability and accessibility of research funds and salary schemes. Some of these results may be due to female researchers having lower confidence in their academic career perspectives: in the sample of the paper, 30.4 % of male researchers at early career stages (PhD students or post-docs) declare to feel very confident about their future career prospects, compared to only 19.6 % of female researchers.

Reinstaller (2013) notes that social innovation and social entrepreneurship are concepts that are widely used in the policy discourse. Despite this they are analytically not well defined and very diffuse. The aim of Reinstaller, therefore, is to attempt to clarify these concepts and to work out how social innovation is likely to contribute to social and economic progress in general, and to industrial change more specifically. He argues that change agents such as policy entrepreneurs can play and have played a significant role in the change of market economies and the internalisation of social and ecological externalities in the past. Change agents often encounter much resistance from inside the established system. Sound democratic institutions (that allow for variety of views and their competition on the ballot box) and a strong civil society are here key to ensure that there is enough social experimentation in society.

Finally, the empirical results by Falk (2013) on the determinants of international investment in intangible assets may help to develop a proactive action plan to increase the attractiveness of the EU countries for future international investments in intangible assets.

As regards shifting the focus of innovative activity, the papers available investigate the potential of innovation and industrial policies more generally, as well as of government regulation more specifically; the role of clusters in galvanizing action in favour of the new growth path; and the benefits of flexible knowledge generation policies over rigid diffusion policies in the area of energy policy. Shifting the focus of innovative activity will certainly be one of area 3's main focal points for the second half of the project.

Aschhoff et al. (2013) do not observe a shift of private sector's production of inventive activities towards technologies which aim at production, storage, distribution, and management of new energy technologies compared to other fields of technology. Given the societal need for new energy technologies the paper speaks in favor of government regulation and incentives to stimulate research, development, and implementation of new energy technologies. However, they do not find arguments that such stimuli should favor SMEs or young firms (bearing in mind the limited scope of their analysis, with data ending in 2007 and a special focus on Germany only; an analysis of the US, .e.g, may have yielded different results).

The findings by Ketels and Protsiv (2013), for example, are consistent with the view that the presence of clusters makes it more likely that companies and regions compete in ways that

support the broader objectives of the New Growth Path, not just GDP per capita. In addition, the profiling of cluster initiatives in Europe indicates that many of them already engage in activities consistent with the New Growth Path. They provide an action platform, possibly facilitating collective action, that can be used for activities that require joint action in a set of related organizations and firms rather than change in the regulatory framework of the economy or individual organizations.

In detail, the authors build a genuinely new set of data that is then explored to evaluate the role of clusters and cluster-based policies in an overall growth strategy aligned with the objectives set in the WWWforEurope project for a New Growth Path. In so doing the authors build and analyse data across EU regions (and so contributes to assessing central question 2 below). The paper starts by outlining a conceptual framework that clarifies the role that clusters play relative to government policies and the actions of individual companies in supporting the emergence of 'High Road' strategies that lead to better New Growth Path-related outcomes.⁶ It then focuses on creating a new set of data that can start shedding light on the empirical relevance of this framework. Overall, the authors find evidence consistent with clusters playing a role in making 'High Road'-strategies more likely to emerge. They also find evidence that European regions differ in their strategies towards these goals, with some being able to pursue all dimensions in parallel. Cluster initiatives widely engage in New Growth Path-related activities, indicating their potential as a tool in mobilising joint action in these areas. More concrete policy implications will be developed in a companion paper by Ketels and Protsiv in the next stage of the project.

Friesenbichler (2013) analyses the market dynamics that technology policy in the energy supply sector created. It stresses that the market selection process under-supplies socially desired renewable energy (RE) technologies. Hence policy makers intervene and promote the diffusion of existing technologies. Friesenbichler (2013) notes that the sector is undergoing a fundamental change as it incorporates an increasing proportion of RE and changes its capital stock. This shift is desirable from an environmental, geopolitical and economic perspective. But the author finds that diffusion policies, the chosen policies in the renewable energy area, are inferior to technology / knowledge generation policies with regards to their long-term effect on the lasting establishment of a new technology base. If the diffusion of existing technologies is promoted, the instruments should consider strong elements of risk-sharing (e.g., through auctions of systems instead of the price guarantees that currently installed via feed-in tariffs), and should favour local structures (e.g., self-consumption rather feed-in) and consider interdependencies. The latter take various forms: industrial (e.g., security of supply, composition of the sector-wide subsidy volumes); social (e.g., cost incidence); and regulatory (e.g., priority grid access). In addition, Friesenbichler (2013) suggests that policies that are based on subsidies and regulations alone are likely to be insufficient due to unpredictable issues that erratically emerge. Given the political objective to broaden the energy mix, policies are most effective if they are complemented by other measures/systems (e.g., emission trading systems,

⁶ A "high road" economic policy strategy tries to achieve economic competitiveness as well as ecological and social sustainability through high productivity enabling to pay high wages etc.; a "low road" strategy aims at narrow external economic competitiveness using low prices, i.e. based on low wages.

energy taxes, awareness programmes), whose implementation is to be assessed separately. As to the electricity sector itself, flexible policy adjustments on a case to case basis (as in Spain or Denmark's power sector) seem to perform better than the steady but rather inflexible implementation of a strategy (as in Germany). On this, the paper argues that reacting flexibly, and even sometimes reducing efforts, does not mean that overall targets are being abandoned.

The paper by Licht and Peters (2013) also contributes by showing that industrial (environmental) policies which shift the innovation focus towards environmental-friendly innovation will probably not destroy jobs but contribute to job creation at least in some member states. Industrial policy might be used in addition or in combination with horizontal policies to stimulate eco-innovation and new eco-friendly production processes without severely endangering employment.

Grabas and Nützenadel (2013) adopt a historical perspective on industrial policy, examining industrial policy trends in Europe and in particular in the 'catch-up' new member states, which have embraced wider trends in policy. They find that a new green orientation of industrial policy is on the rise in new Member States.

In detail, the paper notes that historical lessons on the achievements and failures of industrial policies in Western Europe after WWII need to be borne in mind for any future effective political action. As economic crises and slumps were always reasons for state intervention in Western Europe after 1945, at the same time these economic crises always provoked a "rethinking" in terms of the suitability of industrial policy approaches, measures and instruments. The integrated and future oriented industrial policy approach of the "Systemic Industrial and Innovation Policy" (SIIP) can be considered as an outcome of such a process, and should be seen as demonstrating that future effective industrial policy has to start from the challenges revealed by globalisation and those in the financial crisis. Improving resource efficiency is one of those main strategic challenges for the EU the importance of which was recognized only recently. However, Grabas and Nützenadel (2013) suggest that the green orientation of industrial policy in the new member states (NMS) of Europe is in its initial phase. Policy documents underline the strong commitment of most NMS governments to this industrial policy stance. Therefore, and of course conditional upon the availability of adequate financing, the years 2014-2020 can be expected to give rise to a widespread trend of green job creation in several CEECs, mainly the ones with more environment-conscious political elites (the Baltic republics, Slovenia, the Czech Republic, potentially Slovakia and Hungary).

Of course, overall these are just a few contributions to a big literature, but the results are promising insofar that they point to room for innovation and industrial policies to support a new growth path more forcefully.

2.3.2 Contribution to other Central Questions

Area 3 focuses on central question 3; however, some papers contain research which also relevant for the other central questions. We will examine them in turn.

Central Question 1 asks whether the EU can improve its lacklustre economic dynamics of the recent years, guaranteeing a maximum well-being of its population and reducing energy and

material input. Many papers described in the section on the compatibility of green innovation with rising employment and social goals are also relevant for this question.

Central Question 2 asks how regional cohesion and social inclusion can be achieved in a “new” growth strategy, minimising risks of detrimental effects on incentives and maintaining the openness of society.

Here, the paper by Aiginger, Bärenthaler-Sieber and Vogel (2013) has relevance to the incentives issue in that one result of the descriptive analysis on competitiveness is the superior performance of the Scandinavian countries, and Denmark in particular, regarding outcome indicators on three pillars - social inclusion (poverty and employment rates), ecological sustainability and economic performance (per-capita incomes, public debt). They also score highly on a variety of input indicators, including those concerning an “enabling” social system (on active labour market policy, social expenditures for the disabled and other disadvantaged groups). Scandinavian social policy could therefore serve as a something of a model of how to achieve social inclusion while minimising negative incentive risks. Income competitiveness is measured by (unit labor) costs, industrial structure and capabilities, outcome competitiveness by the ability to provide Beyond GDP goals.⁷ A number of other MS papers have a significant regional dimension so are pertinent to this central question, among them Amison and Bailey (2013) as well as Ketels and Protsiv (2013), for example, on the role of clusters in contributing positively to ‘high road’ strategies in regions.

Central Question 4 asks how institutions of modern market economies can be changed so as to internalise the current social and ecological externalities and to decrease volatility and divergence in Europe.

Reinstaller’s (2013) paper on social innovation notes that established institutions are structurally conservative forces as they enforce established informal and formal rules. However, the decentralised identification of problems and development of potential solutions is an important activity for social and economic progress. The paper notes that change agents such as policy entrepreneurs can play and have played a significant role in the change of market economies and the internalisation of social and ecological externalities in the past. Change agents often encounter much resistance from inside the established system. Reinstaller’s paper is of note in that it highlights that (significant) institutional change progresses through alternating phases of short periods where new ideas punctuate existing social equilibria where volatility is high and longer periods of stabilisation where volatility is low.

Despite the difficulties social entrepreneurs may encounter, they can play a very distinct role in shifting existing institutional equilibria. Public-private innovation networks can be an important means to drive institutional change. Because of their particular professional backgrounds they bring in specific assets and knowledge pertinent to the problems the innovation network tries to address through social innovations. Often they also take over the role as advocates of the (potential) beneficiaries of these innovations and are viewed by the different members of these

⁷ These would arguably manifest themselves in high employment rates, high productivity, and eventually low public debt ratios.

networks as "honest brokers" because they are not driven by commercial interests. This puts them in the position to shape the nature, direction and timing of the innovation. In addition, unlike business entrepreneurs they are not interested in protecting their inventions through IPRs because they are keen for others to take up their innovations as rapidly as possible. Finally, also the types of innovation in which they engage are distinct. Their focus lies on the provision of new or the improvement of existing services, the ways of delivering services, policy innovations (changes to the thought or behavioural intentions associated with a policy belief system), conceptual innovations (development of new world views that challenge assumptions underpinning existing service products, processes and organizational forms) or systemic innovations (new or improved ways of interacting with other organizations or knowledge bases).

He argues that the failure of companies to generate innovations and be competitive is an institutional and organisational and not so much a market failure. These failures arise as the management, the organisational memory of companies, financing institutions rely on inadequate beliefs and mental models in their decision making. Social innovation can play four roles in overcoming such failures. The first role can be conceived as the inside-out function of social innovation: as innovation is a social and organisational process organisational mechanisms that support experimentation, the development of new interpretations of reality (i.e. new mental models and belief systems) and their integration into the organisational set up are crucial to escape organisational myopia. The second role may be conceived as an outside-in function of social innovation. Strategic choices about resource allocation are based on beliefs about how markets and competitors and relevant institutions work, and what consumers need. Often these beliefs turn out to be wrong, as the management is not aware of significant changes in consumer preferences or other relevant institutional factors. The monitoring and close interaction and exchange of companies with change agents can break this type of institutional myopia. Another role for social innovation is that companies turn themselves into change agents in order to change institutional framework conditions that are unfavourable for their activities. Recent attempts to bypass traditional banking finance and engage into crowd funding schemes are an example of the third role social innovation can play in overcoming institutional failures in the context of industrial innovation. The final role is that specific types of social entrepreneurship involve the creation of new businesses and hence the development of new markets.

Finally, **central question 5** asks how the general public, third sector actors and vested interests can be motivated to support reforms towards a new growth path.

Aiginger, Sieber and Vogel analyse the outcome side of competitiveness, which explicitly includes measures of the economic and social wellbeing of the population, and shows empirically which input factors may lead to better outcomes thus defined; hence the results of this analysis could potentially be used to increase public support for reforms in these areas.

Friesenbichler (2013) notes that in terms of innovation in the energy sector, this might occur through a broadening of the ownership structures, i.e. the involvement of new players that favour new technologies over the old ones. This could eventually result in a weakening of the voice of representatives of less socially desired technologies – such as the co-operative ownership models in Denmark and Germany's 'Bürgerkraftwerke' (i.e. citizen owned RE plants) broaden the ownership structures. Citizens hold shares of the structures that deliver power to

them. This seems to have improved the public acceptance as well as the understanding of interdependencies (e.g., infrastructural requirements). Applying them elsewhere might pose a 'social innovation' (depending on the definition applied). It is also a pivotal element of the democratisation of the energy sector. Friesenbichler (2013) notes that a similar aspect is the emergence of 'pro-sumers', i.e. producers and consumers. For instance, a private household can own and operate a solar panel, and partly use the generated electricity for self-consumption. This led to a broadening of the supply structures, and a direct participation of previously not-included agents in the new market order.

Reinstaller's paper - on social innovation and social entrepreneurship - notes that CQ5 is a normative question as the precise notion of a "new growth path" needs to be filled with meaning by politicians and civil society, and not so much by researchers. However, the paper does provide an overview of the mechanics of institutional change and social requirements; i.e. how altered perceived reality by some change agents, may induce changes in beliefs that in turn may induce institutional changes that finally can lead to new or altered policies (see response to central question 3 above).

2.3.3 Open questions and further research topics

This report gives an overview of the first stage of the project, mainly devoted to analytic papers relevant for establishing a new growth path. More elaborate policy papers which will address the role of innovation and industrial policies in enabling a sustainability transition will be part of the second stage of the project.

What is missing according to the Dow and what could come here are ideas/concepts of how the research will help towards operational solutions of incorporating different types of innovation (process, product, organizational and social innovation) into the models used in the project.

What is also missing is the gender dimension, although there are several papers that offer themselves for a gender-differentiated analysis (e.g. career choices); also other subjects (social innovation, employment effects of green innovation) should have a gender dimension.

What I miss in this otherwise interesting paper is a more explicit role for industrial and/or innovation policies or strategies. What the paper does is to lay out analytically a number of positive innovation issues, but it omits the policy aspects.

2.3.4 Abstracts of relevant milestones and deliverables

See Annex 1.

2.4 Contribution of Area 4

Andreas Sachs (ZEW)

This Area focuses on issues of the European policies and governance initiatives in the context of the new growth path and the requirements of a socio-ecological transition. Its research objectives are

- to identify the main inherent deficiencies in the EU and the related bottlenecks on the way to the new growth path;

- to analyse the link of these deficiencies to the governance structures and the institutions at the European level;
- to elaborate the changes in the European governance framework which are necessary for the transition to the new growth path.

The work conducted in this Area should result both in analytic insights into the internal economic and institutional deficiencies of the European Union in its current state, as well as in a series of implementable policy recommendations aimed at redesigning the governance structure and the institutions of the European Union with the objective of solving its deficiency problems and embarking on the new path of growth and social development.

Currently the European Union is an area with large disparities, structural differences in labour, product and financial markets, an incomplete integration and an asymmetric policy framework. This leads to deficiencies which do not only limit economic and social development in Europe, but also seriously threaten the cohesion between member states and thus the participation of substantial parts of the population in the benefits of the project of European integration. Governance structures and institutions have struggled to prevent disparities from growing and to make convergence happen, both between and within member states. Furthermore, the large heterogeneities across member states make the European policy framework less effective.

A serious attempt to address these weaknesses, improve the governance structure and shape the socio-ecological transition is the Europe 2020 strategy. A change towards a new path of smart, sustainable and inclusive growth however needs substantial changes in the governance structure towards a more consistent and coordinated supranational macroeconomic governance system, supported by regional and national policies. Changes in the monitoring structure and the transition towards a new growth path have to account for differences across regions and states of development.

This Area assesses the extent of disparities and heterogeneities across the EU, analyses the causes and implications of these internal problems and deals with the necessary changes in policies, governance initiatives and institutions at the European level, which are necessary for the transition towards a new path of growth and social development. While a concentration on short-term crisis management is unavoidable in the current situation and will ensure the survival of the EMU on a five to ten year horizon, a climate of fiscal austerity and increasing disparities will be the inevitable result and cripple the achievement of the objectives of the Europe 2020 agenda. In the medium to longer term, it will prove politically impossible to sustain EU integration without the adoption of successful policies and instruments of governance to promote faster innovation, more dynamic growth, and a more sustainable model of social and economic development, in the face of the triple challenges of globalisation, demography and climate change.

Some of the aforementioned issues have been already tackled in Area 4 research. The following overview on the findings up to now is structured along the five central questions of the WWW project.

2.4.1 Contribution to Central Question 1

The basic assumption which is made by area 4 to answer this question comes from the validity of the Europe 2020 strategy. This strategy provides the framing for improving economic conditions under the restrictions of reducing energy use and guaranteeing social inclusion. In the following, Area 4 mostly takes the necessity of reaching environmental goals (dealt with by Area 2) and social goals (Area 1) as given restrictions and discusses how a stronger participation in world growth can be reached.

The great recession has led to sharp increases in the unemployment rates of many industrialized countries. This increases the burden on public budgets, makes a loss of human capital and, thus, of productivity potential more likely, and weakens the role of consumption as a pillar of economic growth. Overcoming these labour market deficiencies by improving high road competitiveness is crucial for a stronger role in world growth and for reaching social, economic as well as environmental goals (see Aiginger et al. , 2013 for an advanced definition of competitiveness which incorporates social inclusiveness as well as ecological sustainability). While the EU provides country-specific recommendations under the heading of the European Semester, it is in some instances unclear which reforms have the potential to improve labour market conditions, and whether these reforms should be country-specific. Consequently, Busl and Seymen (2013) and Sachs and Schleer (2013) deal with the effects of labour market reforms on the labour market and further macroeconomic aggregates. Busl and Seymen (2013) determine the labour market impact of labour market reforms in a two-country dynamic stochastic general equilibrium (DSGE) modelling framework. The findings indicate that both increasing the efficiency of matching unemployed and vacant positions as well as reducing unemployment benefits can have substantial beneficial effects on unemployment and output. The first reform makes successful job matches more likely, while the second increases the job search intensity of the unemployed which raises labour supply. All in all, the results suggest that the model is well-suited for the simulation of labour market reforms since it does a good job in explaining a large part of what happened in the German data before the crisis. The French economy is subsequently taken as the example to demonstrate the opportunities to improve general economic conditions through labour market reforms in Europe. It is shown that an increase in the matching efficiency (i.e. how efficient are job seekers and vacancies matched) and a reduction in employers' social security contributions co-financed by a consumption tax increase might have significant positive effects on the overall macroeconomic performance in general and the unemployment rate in specific.

Similarly, Sachs and Schleer (2013) deal with the aggregate labour market impact of reforms of various labour market policies. However, the authors focus on the relevance of the dependency of labour market reforms on the country-specific regulatory framework. From a theoretical point of view, interdependencies between labour market policies are well-grounded, and the labour market impact of a deregulating labour market reform depends on the regulatory level of other labour market policies. The empirical findings of Sachs and Schleer (2013) emphasize the relevance of interdependencies between six different policy tools (employment protection, unemployment benefits, labour taxation, bargaining coordination, bargaining power, and product market regulation). The impact of a (de)regulation crucially depends on the country-specific

regulatory level. In other words, while, for instance, deregulating employment protection helps to reduce unemployment in Italy, it exhibits detrimental labour market effects in France since the French regulatory framework differs from the Italian one. Hence, in line with the findings of Busl and Seymen (2013), different starting positions may lead the reforms to have distinct quantitative effects. Therefore, the EU should be careful when referring to successfully reforming countries as best practice examples in formulating recommendations. Overall, especially reductions in labour taxes, union bargaining power, product market regulation, and bargaining coordination seem to be unemployment-reducing in the majority of countries. In contrast, lowering employment protection and unemployment benefits are much less likely to have the trivially expected consequences that deregulation is the road to success, although such reforms would be beneficial in some countries. This does give only limited support to the findings of Busl and Seymen (2013) who emphasize the unemployment-reducing role of low unemployment benefits. It can be claimed that this effect depends crucially on the country-specific regulatory framework. Obviously, both contributions focus on (un)employment as the target indicator and do not further discuss the influence of labour market reforms on other indicators for social goals like poverty rates, wages, working conditions or diversity which are also important social goals.

While the previous studies focus mostly on old member states, a focus on the EU integration strategies and the movement of Central and Eastern European Countries (CEECs) to a new growth path is discussed in the case study of Rozmahel et al. (2013). Transition strategies of CEE countries along the following dimensions are compared: (i) political stability, (ii) formal (political) institutions, (iii) informal institutions, (iv) economic level, and (v) real prospect of accession to the European Union. Based on comparisons of the integration strategy across CEE countries it is concluded that specific national policies during the transition process do not significantly influence the success of integration. Moreover, the authors identify the level of (non-elite, that is political instability emerging from violent coups, riots or civil wars) political stability, quality of institutional framework, maturity and compatibility of informal institutions and initial economic level as the key determinants of the success of the transition and integration process in Central and Eastern Europe. A different perspective on the issue of heterogeneity is taken by Busl and Kappler (2013). In this paper, it is argued that a prerequisite for a successful common monetary policy which allows the transition to a stable growth path (in the EMU) is a considerable degree of homogeneity of cyclical fluctuations in that area. Synchronised cyclical fluctuations are crucial for a long-term transition to a new growth path by facilitating the adoption of EU-wide or EMU-wide macroeconomic policies and by reducing imbalances across countries. However, synchronised business cycles also increase the vulnerability of the EMU by facilitating the propagation of shocks. Busl and Kappler (2013) analyse the relevance of various channels for increasing business cycle synchronisation between countries. It builds upon the existing literature by improving the empirical model specification and relates a bilateral measure of business cycle synchronisation to bivariate variables capturing the intensity of foreign direct investments, trade linkages and the similarity of the sectoral structure. The findings suggest that policies to attract more FDI from abroad go, in general, hand in hand with an increased similarity of business cycles with the corresponding international partners. Furthermore, higher

similarity of sectoral structures across countries is also linked to more synchronised business cycles. Against the findings of previous studies, Busl and Kappler (2013) do not find any significant impact of stronger trade linkages on synchronicity. This result points to the importance of common shocks in driving the correlation between trade integration and business cycle correlation.

Finally, an Area workshop with various experts in the field of European governance sought to identify the blind spots of EU economic governance and explicitly dealt with the triangle of growth, individual well-being and ecological sustainability. Main results are that from a governance perspective economic heterogeneity in Europe should be addressed by explicitly mentioning the long-term goals of the Europe 2020 strategy in the short-term oriented country-specific recommendations of the Macroeconomic Imbalance Procedure (which is part of the European Semester, a governance tool established as a reaction to the economic crisis). This would result in a well-balanced strategy between following the ecological long-term goals stated in the Europe 2020 strategy with required economic short-term adjustments to regain economic competitiveness. Furthermore, the possibility of introducing EU reform contracts along the priorities of the new Social investment package, as well as the creation of social imbalance indicators have been discussed. Both could contribute to a greater focus on socio-economic heterogeneity between and within EU member states.

To summarize, a stronger link between EU economic governance and the long-term goals provided in the Europe 2020 strategy, particularly on the ecological and social goals, would bring the focus back on the need for more balanced and resilient growth models. This, however, requires a clearer definition of objectives and more binding power for target monitoring. The EU should ensure to deliver short-term oriented support especially to member states through country-specific reform recommendations which take their peculiarities into account and which could overcome national reform resistance. Ideally, such short-term oriented policies have also positive long-run effects for the long-term sustainability objectives. With a focus on integration of CEE countries, the EU could learn from the findings of Rozmahel et al. (2013) which provide a list of requirements for economically successful transition economies.

2.4.2 Contribution to Central Question 2

Rozmahel et al (2013) compare transition strategies of CEE countries along the following dimensions: (i) political stability, (ii) formal (political) institutions, (iii) informal institutions, (iv) economic level, and (v) real prospect of accession to the European Union. Based on the comparison of integration strategies across CEE countries it is concluded that specific national policies during the transition process do not significantly influence the success of integration measured by a convergence of economic and social outcomes. Moreover, the authors identify the level of (non-elite) political stability, quality of institutional framework, maturity and compatibility of informal institutions and initial economic level as the key determinants of the success of the transition and integration process in Central and Eastern Europe. To a limited degree, this exercise can provide some input for promoting regional cohesion. However, such one-size-fit-all considerations might have a limited applicability as the comparability of countries, especially between CEE countries and peripheral countries of the EU, is not necessarily given

or influenced by factors which have not been considered in the analysis of CEE countries. Further, the relevance of such integration strategies for a socio-ecological transition as focused in the WWForEurope project may be limited which is why the findings have to be interpreted with care.

2.4.3 Contribution to Central Question 3

Area 4 does not contribute to central question 3.

2.4.4 Contribution to Central Question 4

Central question 4 is tackled in some way by nearly all milestones and deliverables produced in Area 4 up to now. The main aspect is divergence/convergence and the issue of externalities from national policies.⁸

Thillaye (2013a) discusses the challenges and opportunities of existing EU governance concerning the transition of European economies towards a new growth model balancing economic performance with social cohesion and environmental responsibility. In this respect, potential conflicts between diverging objectives from the long-term oriented Europe 2020 strategy and more short-term focused procedures like the Macroeconomic Imbalance Procedure and ways to combine both are discussed. Thillaye (2013a) reveals a prioritization of fiscal consolidation and short-term market based adjustment policies over longer-term objectives pursued by the Europe 2020 strategy. The collective outcome of these policies and the impact of national reforms on the whole EU tend to be overlooked as well. Directly related to this, Thillaye (2013b) provides a series of concrete recommendations on how to increase the quality and the impact of EU economic governance in order to facilitate the socio-ecological transition of European economies and their convergence. More concretely, building upon the findings of Thillaye (2013a), Thillaye (2013b) highlights the negligence of an appropriate long-term agenda of human investment and social cohesion. As a solution, a more prominent role for social partners and equal attention to economic and social imbalances during the (short-term oriented) European Semester is suggested in order to reduce the risk of a trade-off between short-term policies and long-term sustainability reactions. Furthermore, the idea of 'reform contracts' between the EU and individual member countries is discussed. While the impact of such contracts is limited, this could nevertheless increase the efficiency of EU pressures and incentives on member states to conduct policies to increase convergence. Crucial for powerful reform contracts is the clear definition of objectives and the right means to monitor the incentives to reach these objectives. Overall, Thillaye (2013b) concludes that within existing treaties the scope for coordination as the core governance method is limited. A resolute objective of convergence and cohesion in the EU requires a more substantial rethink of EU policy-making. Closely related is the fragmented EU policy making which frequently results in opposing effects. Coordination therefore not only relates to agreements between regions or countries but also between different layers of EU policy making.

⁸ Externalities from, for instance, climate policies can also emerge as a result of EU policies to the rest of the world.

The question as to how the EU can contribute to economic convergence between European societies, and whether it is a necessary and beneficial goal for the EU to achieve a high level of homogeneity is tackled by Rozmahel et al. (2013). By analyzing the integration strategies of CEE countries, and by identifying their impact on economic heterogeneity in the EU, this milestone shows that the EU is still characterized by a rather high level of heterogeneity caused by different welfare state models. This complicates the harmonization of economic conditions across countries pursued by the Europe 2020 strategy. Rozmahel et al. (2013) therefore recommend accepting a certain level of heterogeneity across countries, a point which does not only refer to economic, but also to social and environmental aspects. Governance in the EU must be built upon a certain level of heterogeneity and should focus on avoiding disparity-increasing policies and instruments and on more efficient coordination across countries, and not on the attempt to strengthen the centralized character of the EU.

Improving governance for heterogeneous economies is the goal of the analysis of van Aarle (2013). This milestone argues that the existing EU budgetary governance framework is not adequately equipped to achieve fiscal consolidation of the member states, and to allow the surveillance of national budgetary actions. Four concepts are described which may help to improve the clout of budgetary governance which are fiscal federalism, multi-level governance and open coordination, hierarchical control systems, and a macro-finance perspective on budgetary governance. They have in common that they could contribute to transform budgetary governance in the euro area from the current ad-hoc-, procedural-, indicator- and rule-based approach to an integrative, process-oriented, diagnostic and self-correcting framework.

Accordingly, Rozmahel et al. (2013) and Thillaye (2013a,b) criticize existing governance structures for being inadequately equipped for dealing with substantially heterogeneous economies. Both suggest strengthening the coordinative role of the EU. However, while Thillaye (2013a,b) focus on better controlling national policies in order to achieve convergence Rozmahel et al. (2013) are in doubt about the long-term objective of a homogeneous union in economic terms. In principle, the milestones take up the discussion started in the policy brief of Aiginger et al. (2012) which highlights two potential ways for EU governance: either strengthen the existing decentralized governance system, or to move towards a fiscal union. In general, this question can be seen as the starting point for a discussion about governance reforms which are able to promote and to accompany a socio-ecological transition.

Three papers in the Area do not directly deal with the institutional aspects of EU governance, but take the country-specific reform recommendations embedded in the European Semester as the starting point. These reform recommendations could be used to foster convergence by recommending the 'right' reforms. However, it is quite unclear which reforms are the right ones at the EU and the national level, given the findings of Busl and Seymen (2013) and Sachs and Schleier (2013). In Busl and Seymen (2013), it is reported that national labour market policies do not work in isolation. Instead, small but nevertheless relevant spillovers to other countries are produced. The model used by the authors allows such spillovers through a change in relative prices and an international asset market. Hence, domestic reforms can produce externalities which have to be taken into account at a supranational level in order to avoid that such reforms foster divergence between countries. Nevertheless, the spillovers seem to be positive, i.e. a

beneficial domestic reform exhibits beneficial spillovers abroad. Coordination is also relevant for the selection of successful reforms at the national level. Sachs and Schleer (2013) show that the same labour market reforms do not necessarily have the same impact in countries differing with respect to their regulatory labour market environment. The authors make recommendations as to which combinations of country-specific labour market policies should be conducted in a specific labour market environment in order to improve country-specific labour market conditions. More specifically, concrete labour market reform plans for various EU countries are provided. Both potential spillovers as well as the dependency of reforms on the country-specific environment are crucial aspects for the European Semester which provides concrete reform recommendations for the EU member states.

Busl and Kappler (2013) take a different perspective on the issue of convergence and analyse the determinants of business cycle synchronisation (as a measure for economic homogeneity). The findings suggest that both policies to attract FDI as well as to increase the similarity of the sectoral structure can lead to a stronger co-movement of business cycles between two countries. The results further indicate that the trade channel is not as important as the earlier literature suggests. Hence, if the EU is willing to increase homogeneity in Europe, policies to strengthen cross-border trade would not be the best solution. Instead, converging sectoral structures (which can hardly be influenced by economic policy since different sectoral structures are the result of the division of labour between poor and rich countries) across countries as well as strengthening FDI could lead to a better outcome in the sense of a closer co-movement of business cycles. Given that higher co-movement makes macroeconomic imbalances across countries less likely and facilitates EU- or EMU-wide policies, it supports a socio-ecological transition.

2.4.5 Contribution to Central Question 5

At a workshop on unleashing the potential of existing EU governance one of the discussed issues has been the need to better involve national parliaments and stakeholders in EU policy coordination in order to generate national support for supranational decisions and recommendations.

2.4.6 Open questions and further research topics

- A main aspect of the research carried out in this Area focuses on various labour market reforms. The findings related to these specific reforms provide various insights in existing country-specific deficiencies and the need for reforms in specific countries. It is shown that the EU can play a more prominent role in defining and monitoring such reforms. However, other reform areas are only touched marginally. For instance, the structure of the public sector, which in some countries amounts to 50 % of GDP, is a key feature of a country's ability to carry out a socio-ecological transition. A shift from backward-oriented public investments which cement the status quo towards future-oriented public expenditures promoting a sustainability transition is required. In this context, classifying public expenditure into past-related, concurrent and future-oriented could be helpful, whereby future-oriented expenditures are assumed to promote transition.

- The research in this Area up to now has a rather narrow focus on economic issues. Since the focus of the project is a socio-ecological transition, environmental or social aspects are underrepresented and goals are unbalanced towards economic growth. Hence, social and ecological aspects should gain further importance and it should be discussed how a more balanced strategy can be achieved through specific governance mechanisms and reforms. In general, there is no need for economic, social and environmental convergence across states, but a growth strategy supported and promoted by the EU which allows EU countries to improve in all three areas according to their abilities.
- The Area up to now deals very much with economic concepts of convergence. A broader focus of convergence related to social and ecological sustainability would deliver an improved view on necessary requirements for a socio-ecological transition. In this respect, it could be discussed more extensively, whether the institutional setup of the European Union, as it currently stands, is conducive to bringing about a SET. Crucial for doing so is to further highlight the mechanism through which decisions are taken within the European Union.
- Area 4 could think about shifting the focus of the debate on European Governance. At the moment a lot of emphasis is placed on the dichotomy between the national level and the European community level. It is, however, questionable that the best approach for Area 4 would be to “set European preferences” regarding the issues at stake. In contrast, a governance system through which the preferences of citizens are accounted for in the policy process is required. Some find it hard to believe that it will be possible to achieve a socio-ecological transition in Europe without taking into account the preferences of the European people.

2.5 Summary Area 5

Thomas Sauer (FH Jena), Peter Huber (WIFO)

Within the WWWforEurope project Area 5 focuses on the regional and local dimensions of the European path to socio-ecological transition leading towards high levels of employment, well-being of its citizens, social inclusion, resilience of ecological systems and a significant contribution to the global common goods like climate stability. Starting point for the area focus on the regional dimension is the fact that any strategy developed to enhance socio-ecological transition is unlikely to yield strong results unless the resources of regional and local actors are mobilized in a cohesive way and the complex interactions between central policy initiatives and their regional or local implementation are taken into account. A new European wealth model thus needs to have bottom up elements. Regional, spatial and local policies have on the one hand to address region-specific problems; on the other hand they must support and underfeed national and European policy. Although this is uncontroversial in the academic as well as public debate and existing policy initiatives (e.g. the Lisbon agenda and also the current EU 2020 strategy) make repeated reference to the potential role of regional and local actors in contributing to their objectives, there is a lack of research identifying the exact nature of the links between regional policy implementation and national and regional institutions.

Given this situation the main contributions of Area 5 to the overall project are to first of all to provide an in depth analysis of regional development processes in the EU. The aim is to use the rich empirical experience of European regions to analyze what factors have contributed to individual success stories of regional development and to draw policy conclusions that also apply to the national level from this. In this respect the results of this area contribute to the first central question of the project. Second of all, the area provides a detailed analysis of the evolution and determinants of regional disparities in the EU. One focus of this research is on the impact of national institutions on regional disparities. Another focus is on the factors contributing to the development of rural-peripheral regions in the EU. In this way the area contributes to the second central question of the project, which explicitly addresses regional cohesion. Finally, the third and probably most important contribution of area 5 is to analyze how regions contribute to the development of the new European model through their own institutional innovations. For this reason the area will conduct 40 case studies that will analyse the preconditions for regional policy making in selected policy areas which include labour market policy, integration policy as well as energy and water provision as well as policies directed to green spaces. The contribution of these case studies will therefore mainly be to the fourth central question of the project.

This summary, in the next part, discusses, how the research aims and results of Area 5 relate to the five central questions of the overall project. The third part then summarizes the results of Area 5 in the first phase of its research. Finally, since the aim of this first phase (called the 'analytical stage' of the project) was to provide a solid theoretical, conceptual and empirical background for derivation of policy recommendations and to develop the design and questionnaires for the field studies, section four provides an outlook on the analysis to be conducted in the second phase of the project.

The central questions and their relationship to the research aims of Area 5

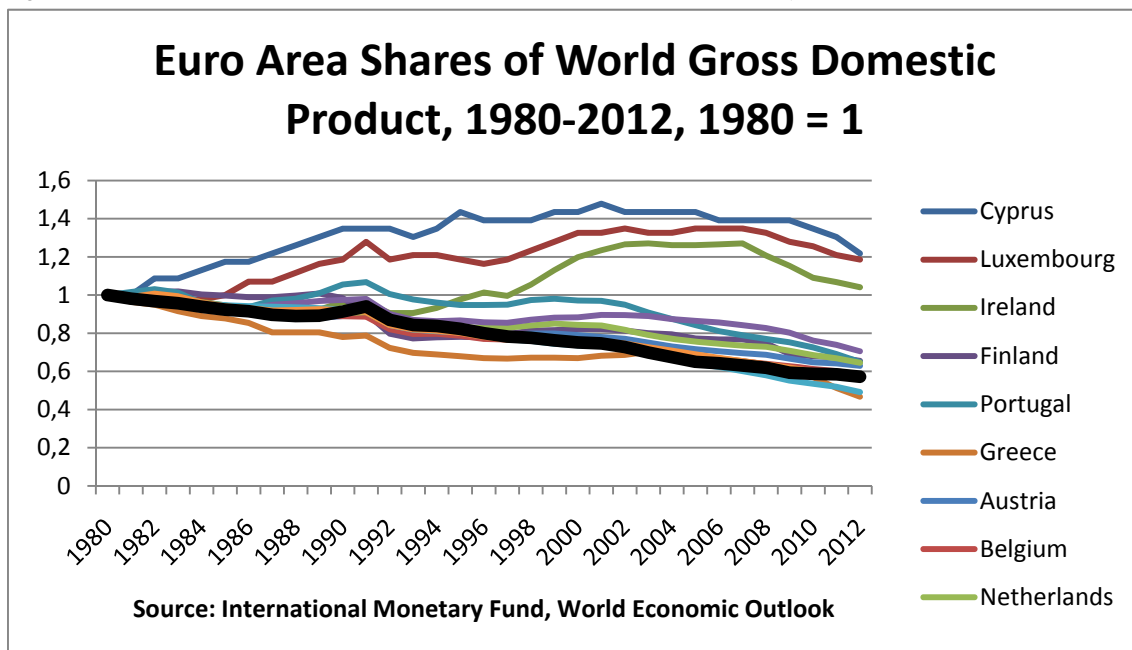
Each of the five central questions provides substantial room for interpretation and has to be made compatible with the purposes of the research objectives of the research area. Thus for instance central question 1 could be interpreted to mean that the EU, as one of the richest parts of the world, should attain levels of growth exceeding those of the poorer parts of the world. This interpretation, however, seems questionable both on positive as well as normative grounds. On the positive side substantial research on both regional and national growth processes finds a tendency for higher growth in emerging or even poorer countries and regions. This questions whether such an objective can be achieved for more advanced countries. From the normative side, by contrast, it has to be questioned whether such an objective is desirable.

For instance, looking at the euro area shares of global GDP since 1980 we find that only three euro area countries succeeded in increasing their shares in World GDP since 1980, at least temporarily (Figure 1): Cyprus, Luxembourg, and Ireland. These countries have in common that they are all rather small and serve as euro area hubs for the financial market. Two of them got in deep troubles during the Great Recession, because of their financial market involvement and the subsequent banking crisis. The rest of the euro area members experienced significant

decreases of their shares of World GDP over the 32 year period considered, (e.g. Germany of -43 percent, Austria of -36 percent, and Spain -30 percent). Empirically this therefore questions the hope for the Euro area or the overall EU to change this growth trend relative to the world through the Europe 2020 framework. Normatively it raises the question of whether this long-term loss of world market shares was really associated with a loss of human well-being and ecological resilience in Europe.

The research undertaken in Area 5 suggests that – rather than maximization of GDP growth - maximization of well being is central to a “new European wealth model” and takes a wide view on the term “well being”. We consider well being to be shaped by a number of variables that include both material aspects (such as income and chances of employment for adequate pay) as well as immaterial aspects (such as political participation and freedom from discrimination). Furthermore, in co-ordination with area 2 it also critically scrutinizes the capability of regions within the EU to “participate more strongly in ... growth” under the constraint of environmental sustainability. Or formulated slightly differently: it analyzes the capability of regions to achieve absolute decoupling between market income growth and resource use.

Figure 1 **Euro Area Shares of World Gross Domestic Product, 1980 – 2012**



Source: Calculations of Area 5

These concretisations of the research questions are of central importance for the past and future work because - as the area focuses on regional developments – its central contributions are to the second and fourth research questions. They are thus concerned with issues of regional cohesion and institutional strengthening of regional policy actors. Focusing only on economic aspects would be a serious limitation for this research, since “cohesion” in general is a wider concept than “economic cohesion” also including social and political aspects. Therefore it makes sense to open the focus, including aspects of institutional change potentially conducive

of improvements in well being from a wider perspective (as for instance through an empowerment of local citizen).

2.5.1 Contribution to Central Question 1

Given these interpretations of the central questions the main contribution of area 5 to the first central question of the WWWforEurope project - against the background of the economic problems of southern EU countries – was to provide a policy brief discussing policy options to improve the economic performance of the Southern European countries of the EU, while maintaining (or improving) ecological sustainability. This policy brief (Aiginger, Firgo and Huber, 2012) argues that the standard national adjustment programs which are based on a combination of austerity measures for budget consolidation and institutional reforms to regain competitiveness, are likely to have high social and political costs in members countries of the European Monetary Union (EMU). It therefore argues for a more pro-active policy and a return to the objectives already foreseen in the Europe 2020 strategy for the lagging countries of the EMU. Thus, policy in these countries should aim to trigger investments in physical and human capital as well as innovation in these countries through supporting SME growth, reforming education systems and supporting innovation. The policy brief also calls upon both the European Commission as well as the countries in the European core to support such reforms financially but also by appropriate incomes policies.

The various background reports (Aiginger 2012, Aiginger Firgo and Huber 2013, 2013a, Firgo and Huber 2013) to this policy brief provide empirical substance to this argument. They use data on 255 regions in 21 European countries, two measures of income and competitiveness, three measures of successful development and various empirical methods to analyze the determinants of regional development in the EU. Across all these variations they consistently find that variables associated with pro-active development strategies (fostering investments in education, physical capital and innovation) are more important predictors of successful catching-up than variables related to strategies focusing on internal devaluation or austerity (e.g. unit labour costs).

2.5.2 Contribution to Central Question 2

The results of these background reports in conjunction with those of Camaioni et al. (2013) and Huber (2013) also question the assumption that large regional disparities (both in terms of GDP and unemployment) in the EU are not primarily caused by institutional heavy labour market regulation. The results, however, also suggest that regional disparities are long-term phenomena, and that catching-up as a rule is associated with repeated setbacks.

Thus with respect to this second finding Firgo and Huber (2013) take a detailed look at processes of catching-up of regions with below average GDP per capita levels. They show that regional convergence in such regions is a discontinuous and highly concentrated process which is associated with repeated setbacks: Just about half of the regions starting with a below average GDP per capita experienced catching-up over the 18 year-period analyzed in their paper. Furthermore, the average catching-up region grew faster than its respective national average for only slightly less than two thirds of the period (and below the national average for

around one third of the period). The average duration of the longest spell of unbroken above national growth of these regions was five years, and the longest spell of below national growth was three years. Catching up is also often strongly concentrated on only a few years of rapid growth. About two thirds of the growth differential of poor converging regions to the national growth rate over the time period observed can be explained by the year with the strongest growth alone.

Camaioni et al. (2013), by contrast, summarize the main features of EU rural areas by linking an economic and geographic perspective on rurality and provide a new typology of European NUTS III regions. Their results show that rural areas in the EU still host a substantial part of the population, contribute an important part to EU-wide GDP and cover a large part of the territory. Moreover, since Eastern enlargement these regions are becoming increasingly heterogeneous in terms of their main socio-economic features as well as of agricultural activities. This increasing heterogeneity leads to a blurring of the traditional urban-rural divide (OECD, 2006), so that a multidimensional approach becomes crucial to catch the different features affecting trends and development of rural areas. In particular, in Europe economic performance and individual income are still strictly linked to accessibility and centrality. Remote and rural areas are still among the poorest regions in the EU.

Drawing on a cluster analysis conducted in this paper a typology of EU regions is developed which will be used in the further analysis to research differences in EU regional development and will be particularly useful in analysing the regional impact of agricultural policy. According to this analysis the clusters of more central and more accessible regions differ substantially from clusters of more peripheral and lagging regions. This highlights that geography deeply affects both the economic performance of regions and their main socio-demographic trends (both in urban and rural areas) and is consistent with the findings in much of the economic geography literature, which has identified the vicinity to major urban agglomerations and accessibility as important determinants of regional development.

Huber (2013) finally analyses the impact of national labour market institutions on regional unemployment rate disparities in EU countries. Starting from the observation that regional labour market disparities are noticeably higher in most of the 27 countries of the EU than in many other developed OECD countries⁹ and that many studies have suggested that this is due to heavy labour market regulation. He conducts a theoretically based, empirical analysis of the impact of national wage bargaining, labour market and housing market institutions as well as product market regulation on regional unemployment rate disparities. The analysis finds robust correlations between measures of wage bargaining centralisation, net replacement rates and regional autonomy with the size of regional unemployment rate disparities within a country. In addition in some specifications minimum wages, generosity of old age and sickness benefits, marginal tax rates, housing market flexibility, employment protection and the costs of overtime contracts have a significant impact. Among these variables, however, only the regional

⁹ Among the top ten countries in terms of regional unemployment disparities among the 27 OECD countries 8 were EU countries in 2010.

autonomy index, net replacement rates, sickness benefits and employment protection increase regional unemployment rate disparities, while the other mentioned variables (wage bargaining centralisation, minimum wages, old age benefits, marginal tax rates, housing market flexibility and costs of overtime contracts) reduce regional unemployment disparities. This paper therefore suggests that institutional reforms alone are also unlikely to reduce the substantial labour market disparities in the EU.

Regarding social inclusion the main focus of area 5 was devoted to analysing the impact of cultural diversity on economic and social development. The reason for this is that cultural diversity has been shown to have an impact on macroeconomic performance (Alesina, La Ferrara 2005, Easterly, Levine 1997, Ottaviano, Peri 2006), entrepreneurship (Audretsch, Dohse, Niebuhr 2010) and social and political stability. In the literature there are, however, serious problems in the measurement of constructs such as cultural diversity and cultural distance. Dohse and Gold (2013) therefore review the pertinent literature on the measurement of cultural diversity in order to develop alternative concepts that carefully deal with the shortcomings of the existing ones. They show that although the correlation between the different measures of cultural diversity is relatively high, the measures are – from a conceptual point of view – rather different and the choice between them will depend on the concrete research question.

Horvath and Huber (2013) build on this contribution and analyse the role of ethnic networks (proxied by the share of same ethnicity migrants), segregation and ethnic diversity (as an important part of cultural diversity) of a region on migrants' success in integration into the host countries' labour markets. They find that migrants have significantly lower unemployment rates (and higher employment rates) in regions where a large share of same ethnicity workers live. Higher ethnic diversity in a region, by contrast, increases unemployment and reduces employment prospects among migrants.

These results therefore point to a number of policy trade-offs with respect to the integration of the increasing number of migrants coming to the EU. The first of these is that – as often found in the literature - diversity has a beneficial impact on economic development of a region through increased productivity and innovation, but has an unfavourable impact on the integration in particular of newly arriving migrants. The second arises because large same ethnicity networks foster integration of newly arriving migrants but hinder long term integration since they may reduce incentives to invest in host country specific human capital (e.g. learning the language).

Given these potential trade-offs, the authors argue that migration - at least from the point of view of recent emigrants should be clustered in terms of ethnicity, but that to secure long term integration regionally adapted policies aimed at supporting the longer-run integration of migrants (e.g. through language training, empowerment of migrant networks, vocational skills training, early intervention in schools) in regions where either the share of same ethnicity is high or which have high ethnic diversity is needed. They also suggest that this approach may be more efficient than the policies, currently followed in some EU countries, aiming to settle migrants in ethnically less diverse regions.

2.5.3 Contribution to Central Question 5

Finally - as a preparatory step to the case studies and in order to better understand how cities and regions initiate processes of change in relation to sustainability, - the research in Area 5 has also contributed to answering central question 5. Labaye and Sauer (2013) provide an inventory of city networks focusing on European transition. These networks, like the early Clinton Climate Initiative, C40, are organisations located somewhere between the traditional dichotomy of private and state sector actors and are often financed by the contributions from the participating cities. The authors find that such networks play an important role in the dissemination of information relevant to sustainable development. While their development appears to have slowed down after a period of intense growth in the 1990s, new initiatives continue to emerge; in particular involving sub-national levels of governments (regions) and only few old initiatives seem to be terminated.

In terms of services provided information sharing remains the core business of those networks, but a significant number have implemented concrete activities to develop and shape local sustainability practices, as well as political activities directed to European institutions and policies. Networks are therefore proper actors of European multilevel governance. The overlap of networks in membership and activities does not need to be seen as a problem. On the contrary, involvement in multiple initiatives might favour learning for the cities involved, and the emergence of innovative solutions. Nevertheless, it is still unclear whether this networking strategy has a significant impact locally, beyond pilot initiatives. The task of evaluating the efficiency of those networks is further complicated by their relative lack of transparency surrounding their financial resources (which is a result as well). Further research in this direction is therefore needed.

The authors also notice that the strong geographical imbalance in the participation of Western and Eastern European cities and regions in the networks observed needs to be taken into account. While cities of the former transition countries are experiencing important environmental and social challenges, they seem not to have (yet) much access to the governance of those networks. From a policy perspective this suggests that if networks are to occupy a significant role in the multilevel governance of the EU, existing networks need to be encouraged to build the capacity of Eastern European cities or new initiatives specifically focusing on this geographical area need to be stimulated.

2.5.4 Outlook for the second phase

Contribution to Central Question 4

While a significant share of the research in area 5 so far has focused on central questions 1 and 2 the core contribution of this area's research will be to conduct a series of case studies in 40 cities. These case studies will primarily address central question 4 on the institutional preconditions of successful socio-ecological transition. They were conducted by native speaking field researchers in the second half of 2013 and consist of a series of three questionnaires addressing issues of energy, water, and green spaces - in order to generate a set of variables from the literature on the governance of common-pool resources in the urban context - as well

as four questionnaires on regional labour market and integration policies, to gauge the impact of the financial and economic crisis on the autonomy of regions in these respective policy fields. Furthermore, an interview guide for semi-structured interviews aiming to go deeper into the thinking of local stake holders on sustainability transitions and beyond GDP goals and a template for the case study reports in order to structure the investigation reporting of field researchers have been used in these case studies.

These case studies will feature 40 European cities including the three European mega-cities Istanbul, Paris and London and further 37 cities that were jointly selected in the area 5 and motivated to participate by ICLEI, so as to provide a representative sample in terms of European regions, average income classes, and characteristics of the national governance setting and the welfare regime. We expect that the case studies will yield important insights with respect to central question 4 of the WWWforEurope project. In particular this questionnaire will assess how regional, national and private sector actors interact in implementing socio-ecological transition.

Research aims of the study on institutional preconditions for socio-ecological transition at the urban level

Taking into account the potentially different starting and framework conditions of regions in different parts of the EU, this research will follow four objectives:

1. Analyze the role of the cities (and regions) in Europe for a successful socio-ecological transition to a new path of growth and development;
2. Describe the organizations, regulations and institutions governing the socio-ecological systems at local and regional level;
3. Assess under which conditions these institutions are capable of playing a key role in a socio-ecological transition towards strong sustainability and enhanced socio-ecological resilience;
4. Examine the potential of new institutional arrangements like cooperatives, multi-stakeholder-constructions, local-regional partnerships and networks as organizational frame for sustainable development on the local and regional level.

Achieving these four objectives would provide an answer to the following to aspects of central question 4: “What would be the new institutions internalizing social and environmental externalities? What could be the role of institutions such as cooperatively managed common pool resources relative to that of private or public goods?”

Conceptual framework of the case study research

This research addresses the question of the transformability of socio-ecological systems (SES) in urban contexts, since cities have been recognized to as one of the central places for in the implementation of socio-ecological transitions by both, the UN and the European Commission as well as a large number of analysts. In particular the qualitative case study research for the first time at this scale will explore the potential of applying the common-pool resource (CPR) approach by Elinor Ostrom and her colleagues, which has so far mostly been applied to rural

ecosystems, to the urban context. The leading idea is that it would be worth to explore how far a third sector of non-profit and non-governmental organisations and networks could play a key role in socio-ecological transition. As common-pool resources are characterised by subtractability and high cost of exclusion, they are neither private nor public goods. Furthermore, CPR are not attached to a specific property regime beforehand. Their sustainable governance implies an institutional diversity beyond the traditional dichotomy of market and state.

The CPR approach has a clear focus on natural resource systems, but we will try to show that this framework is also applicable to man-made, and hybrid resource systems like the energy system. It allows for the specification of a clear set of key variables, determining the local self-organization capabilities for the management of such SES. We will observe how far a rather homogenous population and local interactions are in favour of local self-organisation and cooperation in the management of the urban commons; and how these variables are supported by a developed welfare state and a high degree of local decision-making autonomy.

Concerning the energy system, we assume that the de-carbonisation could have significant spatial implications, in the sense that a more decentralised production of renewable energy would re-unite the local production and consumption of electric power. The technological shift from fossil fuels to renewable energies will enhance the opportunities of a spatial re-coupling of energy transformation and energy consumption, and improve the overlapping of resource and governance systems at local level. Thus, we hypothesize, if the share of renewable energy harvesting in the overall economy increases, and if the chosen path of renewable energy technology development is in favour of miniaturized and decentralised energy generation an increasing ratio of energy transformation to its total final consumption inside the city limits should be observable. In other words: major functional urban areas should rely less on long-distance energy imports.

Furthermore, we include a multi-domain approach in our case studies, because at the local level the energy system interacts strongly with other natural resource systems like water and land. This is important for the successful management of sustainability transitions: "Transitions inherently operate in multiple domains. Inputs from other domains than the prevailing domain are therefore important: not only in terms of lessons learned, innovative ideas, and actors involved but also in terms of integral policy" (Rotmans, Loorbach 2008, p. 27). For example, the increasing use of renewable energies will probably demand a higher degree of land-use compared to the carbon fuel regime. Thus it makes sense to analyse the energy transition jointly with its interactions with the urban land socio-ecologic systems. Therefore we could hypothesize: A higher degree of policy integration should improve SET indicators significantly.

The central focus of the case studies will therefore be on third sector activities in relation to market and government activities in SET: We assume, if self-organized and co-operative forms of management of common pool resources emerge, due to a complex set of variables, such as common, widely shared of the need and dimensions of sustainable urban development, opportunities for potential actors to intervene in this development, experience and leadership already gained in the past, norm-adoption of the central actors, shaping the institutional change, and institutional settings emerging, such as sufficient local decision making autonomy and

appropriate property rights. The SES transition model to be explored will rely on the following rough hypotheses:

- A commonly agreed understanding on the functioning and the prior objective for the local socio-ecologic systems would enhance the probability that an institutional transition process concerning this SES is already started.
- A second important precondition for institutional transition processes concerning local SES is the perception of clearly defined opportunities for new institutional arrangements in the SES governance, e.g. in terms of technological innovation or social inequality decreasing welfare regimes.
- A third precondition for locally self-organized governance of SES would be a significant amount of already existing leadership and prior experience in such SES management, as well in multiple domains
- The fourth cluster of variables assumed as influencing the self-organization capabilities (SOC) of the local stakeholders is around the norm-adaption evolving out of the leadership and prior experiences concerning the aims and goals of the local SES management.
- Finally, there should be observable variables on the institutional changes emerging in terms of local decision-making autonomy and formal property rights in favour of an improvement of the local SOC.

The SES questionnaires are structured to generate data covering these variables.

3. From Analysis to Policy Conclusions

Kurt Bayer (WIFO)

In order to organize results of the important, but often centrifugal contributions of the many analytical papers, they were grouped around 5 Central Questions, which related to the central tradeoff between economic growth and pursuing social wellbeing and maintaining environmental quality; regional diversity and inclusion; the role of social and technical innovations; the role of modern market institutions in the transition process; and, finally, how the public can be motivated towards socio-ecological transition.

Analyzing the contributions of the 5 Areas to these Central Questions reveals the major tradeoffs between pursuing simultaneously growth, social inclusion and environmental goals, but also a large number of synergies between these goals. This is important for the formulation of policy conclusions, since these will have to deal with, primarily, proposing policy instruments promoting synergies, but will also need to deal with tradeoffs and incompatibilities. In order to arrive at a “Sustainability Strategy”, the Area Reports and the results of the individual papers will form the basis for a large number of individual “projects” which simultaneously pursue all three sub-goals (economic, social, environmental: ECE), but to various degrees. Concretely, this implies that each potential project identified must elaborate its effects on each of the ECE categories and be chosen in a way which is acceptable to stakeholders of all three ECE groupings. This may often be a second or third-best option for each individual category.

While the overall transition strategy will be directed towards Europe, i.e. the European Union as a whole, its implementation will have to occur at the level of member states and regions. In this way, the EU strategy can also serve as a role model for global sustainability. While the WWWforEurope project will propose a wide menu of policy options at the EU level, individual regions and member states will choose from that menu (and devise additional projects), depending on each region’s economic, social and environmental situation. Tradeoffs and synergies will be different for each region/state. In this way, no “one size fits all” strategy can be pursued – but all relevant policy actions will need to conform to the overall umbrella goal of attaining socio-ecological sustainability.

So far, the tradeoffs between the transition strategy’s sub-goals have not been dealt with in detail. Each area, in effect, worked out and analyzed its own separate work package. Clearly, each contribution did, to some extent, have tradeoffs and synergies in mind, but up to now pursued its own direction. Policy conclusions, however, will have to deal with tradeoffs and identify synergies as their pre-condition for proposing instruments and measures. As the analytical contributions show, policy conclusions will need to be very broad, ranging from objectives, targets and instruments in each of the three sub-categories, to over-arching issues like institutional arrangements, innovation and education promotion, regional and industrial policy, to procedural questions at the EU level and within the existing EU Treaties.

There are also important questions to be answered about which indicators to use to measure progress towards “total” (i.e. economic, social, environmental) sustainability, and within each of the three sub-categories. For instance, the question begs to be answered, whether GDP growth should in the future stand for the degree of human well-being, or whether other, more

appropriate indicators might be used. Such use could make some of the trade-offs between “economic” and “social” goals disappear.

Policy options should have a clear understanding that important trade-offs will exist anyway, if not in substance, but in the perception of interest groups/stakeholder groups which prioritize one of the three sub-goals over the others. In many cases, it will not be possible to convince e.g. one group that the goals of the other groups should take precedence, because people’s preferences are strongly held, often in the form of “Weltanschauungen”/world views. Thus, while information campaigns must still form an important part of a successful transition strategy, the pre-dominant mode of policy-making must be to take other preferences into account as given, and thus to search for “solutions” to problems which are acceptable to all groups, if not preferred. The concept of “Satisficing” which was introduced in 1960 by the decision theorist Herbert Simon to describe “a decision-making strategy or cognitive heuristic that entails searching through the available alternatives until an acceptability threshold is met” (Wikipedia) is relevant here. By recognizing that quasi insurmountable impediments exist between interest or stakeholder groups, the search will be for second-best solutions. As wide acceptability as possible of solutions is necessary, however, in order to be able to implement solutions. If, on the other hand, solutions violating essential interests of stakeholder groups are imposed from above, people will search to circumvent the rules and make the path towards sustainability impossible.

To sum up, the following tasks need to be accomplished in the forthcoming phase of the WWWforEurope project:

1. A Grand Vision for a Sustainable Europe needs to be developed by the project to guide further steps.
2. A number of qualitatively defined, and where possible, quantitative objectives towards EU Sustainability need to be developed. A role model could be the 2000 Millennium Development Goals for Global Development¹⁰, where in 8 categories sub-targets were defined. Goal 1 is “eradicate extreme poverty and hunger”, defined partially as “halve, between 1990 and 2015, the proportion of people whose income is less than \$1.25 a day”.

These objectives, in the fields of economy, social inclusion and environment, can stand side-by-side, without regard for trade-offs or synergies.

3. A list of “no-go” areas needs to be developed, which define paths away from sustainability in the economic, social and environmental fields. This could include, e.g. “no more new lignite-based power stations”, “no nuclear power”, or “no more tax

¹⁰ The 8 Millennium Goals are:
- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV/Aids, malaria and other diseases
- Ensure environmental sustainability
- Global partnership for development

competition with a view towards attracting foreign investment”, as well as a number of financial market areas where past experience has shown that they are socially and economically disruptive. There could be disincentives to prevent such directions to happen, but WWWforEurope should also not shy away from outright prohibitions of certain activities. Market incentives might frequently not be effective.

4. Develop, as exhaustively as possible, a list of trade-offs and synergies, without reference of how to resolve trade-offs.
5. Develop, as exhaustively as possible, a list of “sustainability projects” as guideposts for countries and regions to pursue at their own discretion. Such projects could be very broad, like the German “Energiewende” and would have to scrutinize potential effects on economic and social sustainability; they could also be very specific, like “shift R&D and innovation resources towards environmental and social goals”; or “promote education and training in the field of care for the elderly”.
6. Policy recommendations should not only include financially costly instruments (incentives, subsidies, financial rewards), but also institutional changes and “command-and-control” instruments.
7. The WWWforEurope project should also develop EU and member state-wide mechanisms how to set these objectives, in which institutional environment recommendations should be made, how progress is monitored and whether or not sanctions should be applied for missing targets or acting in manner endangering sustainability.

4. Cross-cutting Issues

This chapter is concerned with cross-cutting issues that offer important insights for the synthesis of the WWWforEurope project. All topics were presented at the first WWWforEurope Feedback Conference and then summarised for this report. Additional input to the project is provided by the first three articles including deliberations on socio-technical sustainability transitions and their policy implications, gender regimes and gender policies in Europe as well as on determinants of individual life satisfaction and societal well-being and their policy implications. The last article summarizes ongoing work of the WWWforEurope project. The presented macroeconomic model considers trade-offs and potential synergies between environmental, macroeconomic and labour market policies. Furthermore it takes into account the inter-linkages between the Research Areas, as identified by these.

4.1 Understanding socio-technical sustainability transitions and policy implications

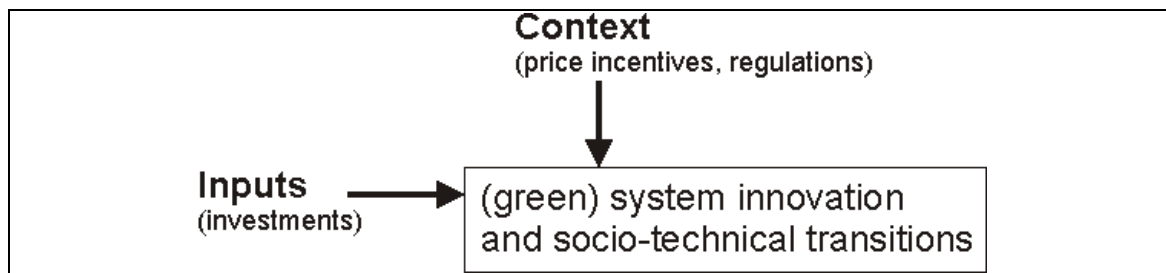
Frank Geels (Manchester University)

4.1.1 Introduction

While ‘green growth’ holds potential for a new growth for Europe, it is a buzzword with at least three different meanings (see also Bowen and Fankhauser, 2011). Firstly, it can imply the greening of growth by internalizing externalities. Mainstream economics highlights the importance of changes in price signals (e.g. via taxes or cap-and-trade instruments) in this respect. Secondly, it can refer to growth in specific sectors through environmental spending and investment (i.e. Keynesian green stimulus). Thirdly, green growth can be seen as requiring a Third Industrial Revolution (Pearson and Foxon, 2012), which would imply structural change, transitions and Schumpeterian waves of creative destruction.

In my view, the third interpretation has the greatest potential to address both environmental problems and generate jobs and growth. It will be difficult to calculate in advance the precise costs and benefits, because of the pervasive uncertainties associated with structural change and major transitions. While the first two views highlight some important aspects in bringing about major transitions (e.g. investments and price signals), their drawback is that the emphasis on context (framework conditions) and inputs does not say much about the actual dynamics of system innovation and socio-technical transitions, leaving it largely a ‘black box’ (Figure 2).

Figure 2 **The emphasis on context and inputs leaves transitions an unpacked ‘black box’**



Source: own illustration

Against this background, the main aim of this paper is to develop a better understanding of the process of socio-technical transitions and to discuss policy implications. The paper does not address the size or quality of green growth, nor the number of associated jobs. Rather, this is largely a conceptual paper about socio-technical transitions that aims to describe a broader perspective than the first two economic views described above. Although the perspective is inspired by neo-Schumpeterian evolutionary economics, it also acknowledges the importance of political and socio-cultural processes. The latter part of the paper also brings in empirical developments, not so much to illustrate the perspective, but to highlight some differences between real-world developments and theory-based assessments.

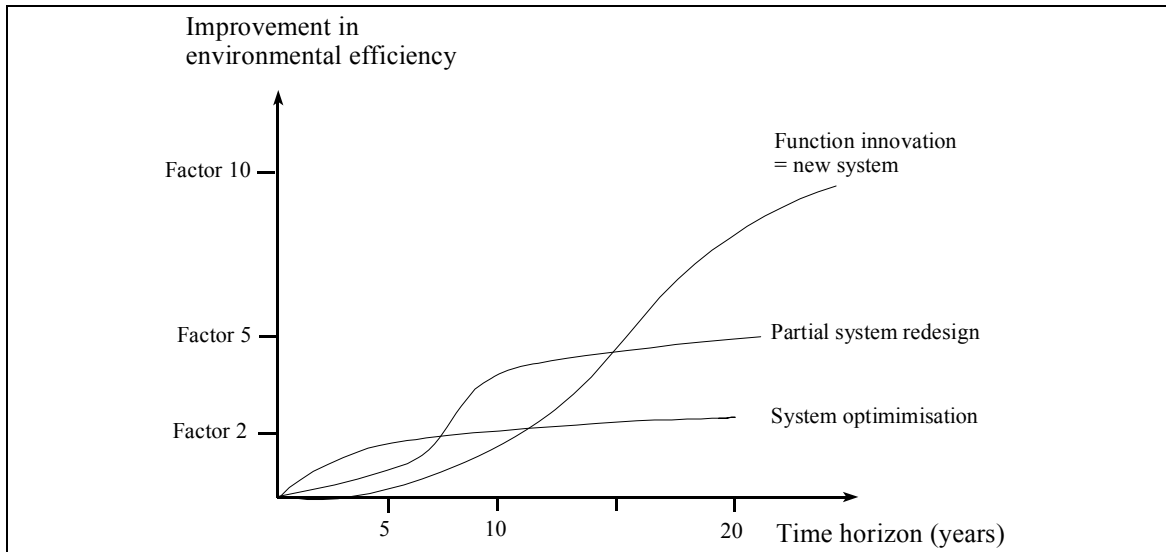
This article is structured as follows. Section 4.1.2 further articulates the phenomenon of socio-technical transitions and describes the multi-level perspective (MLP). Section 4.1.3 discusses general policy implications that follow from the theory. Section 4.1.4 addresses real-world problems in the implication of these policies and processes that hinder socio-technical transitions. Section 4.1.5 provides concluding comments and suggests various ways in which sustainability transitions may accelerate in the coming years.

4.1.2 The multi-level perspective (MLP) on socio-technical transitions

4.1.2.1 Unit of analysis and conceptual backgrounds

The background of the increasing policy and academic interest in transitions is the promise that large gains in environmental performance (factor 5 or 10) may be realized through transitions to new kinds of systems in energy, agro-food, buildings and transport domains. Although Figure 3 suggests that incremental improvement and system optimisation are important in the short term (5 years) to achieve environmental gains, this strategy is unlikely to get us towards larger gains in the longer term (e.g. 80% reduction of CO₂ emissions by 2050). The short-term strategy should therefore be complemented with a longer-term strategy to shift towards new systems.

Figure 3 **System optimisation versus system innovation**



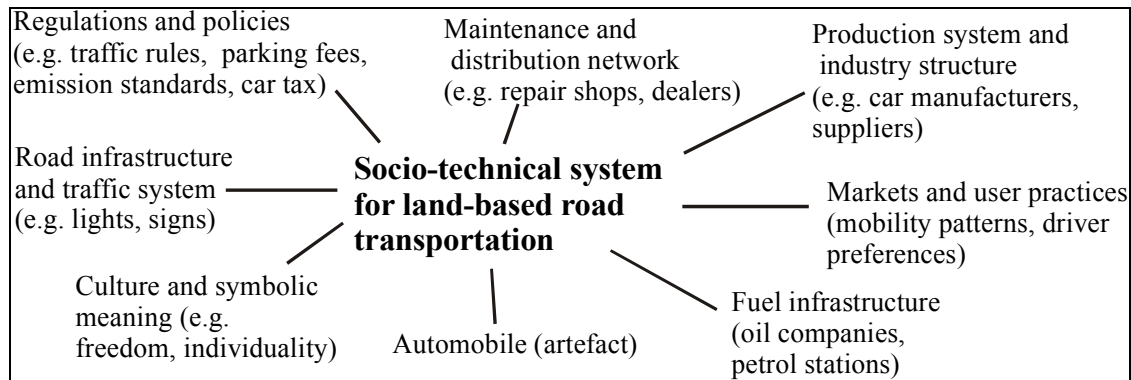
Source: Weterings et al., 1997

I conceptualise systems as ‘socio-technical systems’ (Geels, 2004), which fulfil societal functions (such as mobility, communication, housing, health care, energy, food) through the alignment of a range of elements, such as technology, regulation, user practices and markets, cultural meaning, infrastructure, maintenance networks, and supply networks.¹¹ Figure 4 provides a schematic example for modern car-based land transport systems.¹²

¹¹ Coming from the field of innovation studies, this socio-technical approach does take ‘technology’ as entry point into discussions of wider systems. This entry point should not be confused with technical determinism or with an approach that focuses on the material (hardware) aspects of systems only. The socio-technical perspective is based on a contextual understanding of technology, which is common in the sociology of innovation (MacKenzie and Wajcman, 1985; Bijker et al, 1987; Hughes, 2004). Besides disciplinary background, there is also another reason for the focus on technology and innovation, namely that many actors have used technology as a way advancing the modernization process since the nineteenth century (Schot, 2003). Technological change has assumed an incessant, endogenous, innovative dynamic in modern, capitalist societies. This does not mean, however, that new knowledge and artefacts are prime movers (which would lead to technological determinism). Rather, the argument is that actors in transition processes give technology a prominent role in their change strategy, making it a site for organizing change.

¹² The precise configuration of elements and social groups involved may vary somewhat for different kinds of systems and over time.

Figure 4 **Socio-technical system for modern car-based transportation**

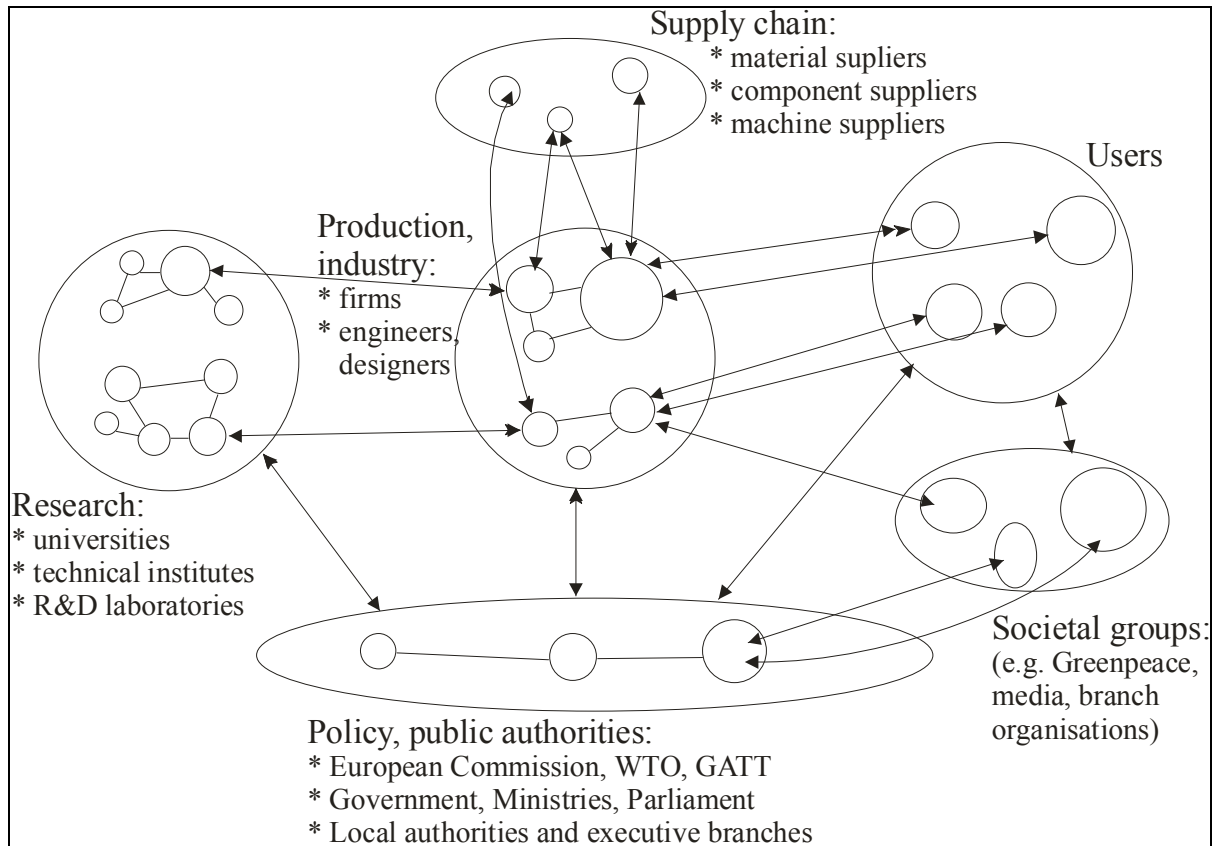


Source: Geels, 2005:446

Transitions at the level of societal functions thus consist of a change from one socio-technical system to another. This kind of problem framing entails a shift in the *unit of analysis* from the focus in most disciplines on either individuals or society/economy at large. This framing accords with Urry's (2010) call for scholars to articulate a middle way between approaches that focus either on macro-contexts (e.g. the nature of capitalism, nature-society interactions) or on individuals (choices, attitudes, motivations). Instead, he suggests that a sociology of climate change "is not a question of changing what individuals do or do not do but changing whole systems of economic, technological and social practice. Systems are crucial here and not individual behaviour". Phrased differently, socio-technical transitions refer to the third level in terms of Freeman and Perez's (1988) innovation typology: a) *Incremental innovations* occur more or less continuously in any industry to improve price and performance. b) *Radical innovations* are discontinuous events, which are unevenly distributed over sectors and over time. c) Changes of *technology system* are far-reaching changes in technology, affecting several branches of the economy, as well as giving rise to entirely new sectors. They are based on a combination of radical and incremental innovations, together with organisational and managerial innovations affecting more than one or a few firms. d) Changes in the '*techno-economic paradigm*' (TEP) are far-reaching and affect conditions of production and distribution in the entire economy.

Socio-technical systems are actively created, (re)produced and refined by several social groups, for instance firms, universities and knowledge institutes, public authorities, public interest groups and users. Their activities reproduce the elements and linkages in socio-technical systems. Using a concept from organization theory, the actors related to socio-technical systems can be conceptualized as constituting an organizational field, defined in DiMaggio and Powell (1983: 148) seminal article as: "those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products. The virtue of this unit of analysis is that it directs our attention not simply to competing firms (...), or to networks of organizations that actually interact, (...), but to the totality of relevant actors." Figure 5 provides a schematic representation of the social groups involved in a socio-technical system. The implication is that socio-technical transitions are multi-actor processes.

Figure 5 **Actors and social groups in organizational fields**



Source: adapted from Geels, 2002: 1260

Table 4 **Three pillars of institutions**

	Regulative	Normative	Cognitive
Basis of compliance	Expedience	Social obligation	Taken for grantedness, shared understanding
Basis of order	Regulative rules	Binding expectations	Constitutive schema
Mechanisms	Coercive (force, punishments)	Normative pressure (social sanctions such as 'shaming')	Mimetic (learning, imitation)
Logic	Instrumentality	Appropriateness	Orthodoxy
Indicators	Rules, laws, sanctions	Certification, accreditation	Common beliefs, shared logics of action
Basis of legitimacy	Legally sanctioned	Morally governed	Comprehensible, recognizable, culturally supported

Source: Scott, 2001: 52

Actors in organizational fields are not entirely 'free' agents. Instead, neo-institutional theory (DiMaggio and Powell, 1983; Scott, 2001) suggests that perceptions and actions are shaped by

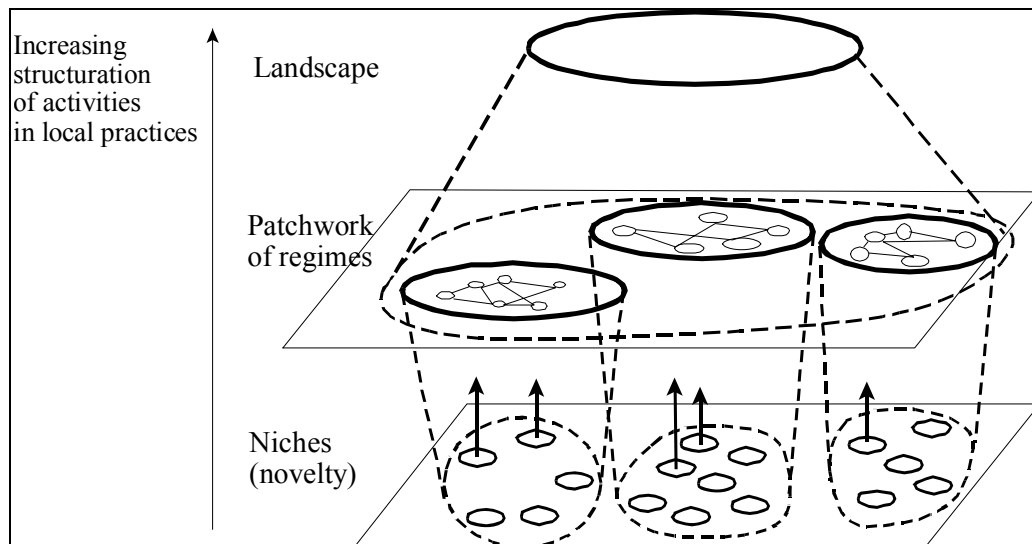
formal, cognitive and normative institutions, while sociological structuration theory (Giddens, 1984) perceives actors as enabled and constrained by shared rules. In the MLP, actors in organizational fields are conceptualised as shaped by socio-technical regimes (Geels, 2004), which is the semi-coherent rule-set shared by actors in the field. Table 4 elaborates aspects of formal/regulative, normative and cognitive rules and institutions.

4.1.2.2 Multi-level perspective

To understand the dynamics of socio-technical transitions, scholars with an innovation studies background (Rip and Kemp, 1998; Kemp *et al.*, 1998; Van Driel and Schot, 2005;

Geels, 2002; 2004; Nykvist, and Whitmarsh, 2008) developed the MLP using insights from evolutionary economics, sociology of innovation, and neo-institutional theory. The basic premise of the MLP is that transitions are non-linear processes that result from the interplay of multiple developments at three analytical levels: niches (the locus for radical innovations), socio-technical regimes (the locus of established practices and associated rules), and an exogenous socio-technical landscape (Rip and Kemp, 1998). These 'levels' refer to heterogeneous configurations of increasing stability, which can be seen as a nested hierarchy with regimes being embedded within landscapes and niches existing inside or outside regimes (Figure 6). The MLP helps explain why there may simultaneously be a flurry of change activities (at the niche level) and relative stability of existing regimes. The three analytical levels are briefly described below.

Figure 6 **Multiple levels as a nested hierarchy**



Source: Geels, 2002: 1261

Niches:

Within the MLP, radical novelties emerge in niches, which are 'protected spaces' such as R&D laboratories, subsidised demonstration projects, or small market niches where users have special demands and are willing to support emerging innovations (e.g. the military). Niche actors (such as inventors, start-ups, outside firms) work on radical innovations that deviate from

existing regimes. Mokyr (1990) characterized radical innovations as 'hopeful monstrosities': they are 'monstrous' because early inventions have relatively poor performance and high costs. But they are 'hopeful', because they offer some kind of valued functionality, which is why special kinds of users may be willing to invest in their further development.

Niche-actors hope that their promising novelties are eventually used in the regime or even replace it. This is not easy, however, because the existing regime is stabilized by many lock-in mechanisms (see below). So, innovations may remain 'stuck' in niches for a long period of time, unable to cross the 'valley of death'. Previous research suggests that the period between invention (emergence of radically new ideas) and innovation (viable market introduction of products) is often about two or three decades (Table 5).

Table 5 **Time lag between years of invention and innovation for some new technologies**

	Invention	Innovation	Time lag (years)
electronic digital computers	1939	1943	4
float glass	1902	1943	41
fluorescent lighting	1901	1938	37
helicopter	1904	1936	32
jet engine	1928	1941	13
magnetic tape-recording	1898	1937	39
radar	1925	1934	9
radio	1900	1918	18
synthetic detergents	1886	1928	42
television	1923	1936	13
transistor	1948	1950	2
zipper	1891	1923	32

Source: selection from Clark et al., 1981: 313-314

Scholars working on 'Strategic Niche Management' (Kemp *et al.*, 1998; Hoogma *et al.*, 2002; Geels and Raven, 2006) suggest that experimental pilot and demonstration projects in real-life contexts may help radical innovations cross the valley of death, by sheltering them from immediate market selection through subsidies and dedicated support networks. SNM-scholars conceptualize these 'protected spaces' as niches where actors can experiment with the alignment between technical variations and (adjustments in) the selection environment. These scholars distinguish three social processes within niches:

- *Learning processes* on various dimensions; about imperfections of technology and how they may be overcome, issues of organisation, market demand, user behaviour, infrastructure requirements, policy instruments and symbolic meanings.

- The articulation (and adjustment) of *expectations* or *visions*, which on the one hand provide guidance and direction to the internal innovation activities, and on the other hand aim to attract attention and funding from external actors.
- The building of social *networks* and the enrolment of more actors, which expand the social and resource base of niche-innovations

Niche-innovations gain momentum if visions (and expectations) become more precise and more broadly accepted, if the alignment of various learning processes results in a stable configuration ('dominant design'), and if social networks become bigger (especially the participation of powerful actors may add legitimacy and bring more resources into niches).

Socio-technical regime:

Radical novelties must compete with technologies that benefit from well-developed systems around them. The alignment of existing technologies, regulations, user patterns, infrastructures, and cultural discourses results in socio-technical systems (Geels, 2004). The system elements are reproduced, maintained and changed by various social groups and actors, which act in the context of socio-technical regimes. The notion of *socio-technical* regimes encompasses not only firms and the activities of engineers, but also other social groups such as users, policy makers, special-interest groups and civil society actors. This concept thus helps overcome the tendency, which is prominent in innovation studies, to view manufacturers as the pivotal actors in regimes. Although manufacturers are undoubtedly important actors (who exert great influence through their product offerings, marketing strategies and political lobbying), regimes are also sustained by habits of use, prevailing normality, cultural discourses, and established practices of professionals,

The notion of a regime introduces a structuralist element in the analysis, by assuming that actor behaviour is constrained by rules located at the collective level of a regime, which cannot easily be changed at the micro-level of individual action (Rip and Kemp, 1998). It is important to emphasize that 'regime' is an interpretive analytical concept, which invites the analyst to investigate the 'deep structure' behind activities, e.g. shared beliefs, norms, standardized ways of doing things, heuristics, and rules of thumb. While the notion of socio-technical 'system' refers to tangible and measurable elements (such as artefacts, market shares, infrastructure, regulations, consumption patterns, public opinion), the notion of 'regimes' refer to more intangible rules on which actors draw in concrete actions.

In existing regimes, innovation is mostly incremental because of lock-in mechanisms and path dependence. Change still occurs, but proceeds relatively predictably in certain directions, giving rise to stable trajectories (Dosi, 1982). Based on different literatures various lock-in mechanisms can be distinguished (Geels, 2004).

- Important *economic* lock-in mechanisms are: a) sunk investments (in competence, factories, infrastructure) that created vested interests against change, b) better price/performance characteristics of existing technologies, which benefit from economies of scale and decades of learning-by-doing improvements.

- Important *social* lock-in mechanisms are: a) cognitive routines and shared mindsets that 'blind' actors to developments outside their focus (Nelson and Winter, 1982), b) alignment between social groups leads to 'social capital', c) consumers embed technologies in user practices, values and life styles (e.g. the car has become embedded in practices such as commuting to work, bringing children to school, shopping, social visits).
- Important *political* lock-in mechanisms (which also related to power) are: a) opposition to change from vested interests, using various corporate political strategies to shape policies in their favour (Levy and Egan, 2003; Bonardi and Keim, 2005), b) existing regulations and incentive structures that create an uneven playing field for old and new technologies. (Walker, 2000).

So, the regime/system level is characterized by relatively stability and reluctance to change (Geels, 2014).

Socio-technical landscape:

The socio-technical landscape is the wider context, which influences niche and regime dynamics. It is a landscape in the literal sense, something around us that we can travel through; and in a metaphorical sense, something that we are part of, that sustains us (Rip and Kemp, 1998, p. 334). It includes spatial structures (e.g. urban layouts), political ideologies, societal values, beliefs, concerns, the media landscape and macro-economic trends. The socio-technical landscape forms 'gradients' for action from which it is hard to deviate. They are beyond the direct influence of regime and niche actors who cannot change them at will.

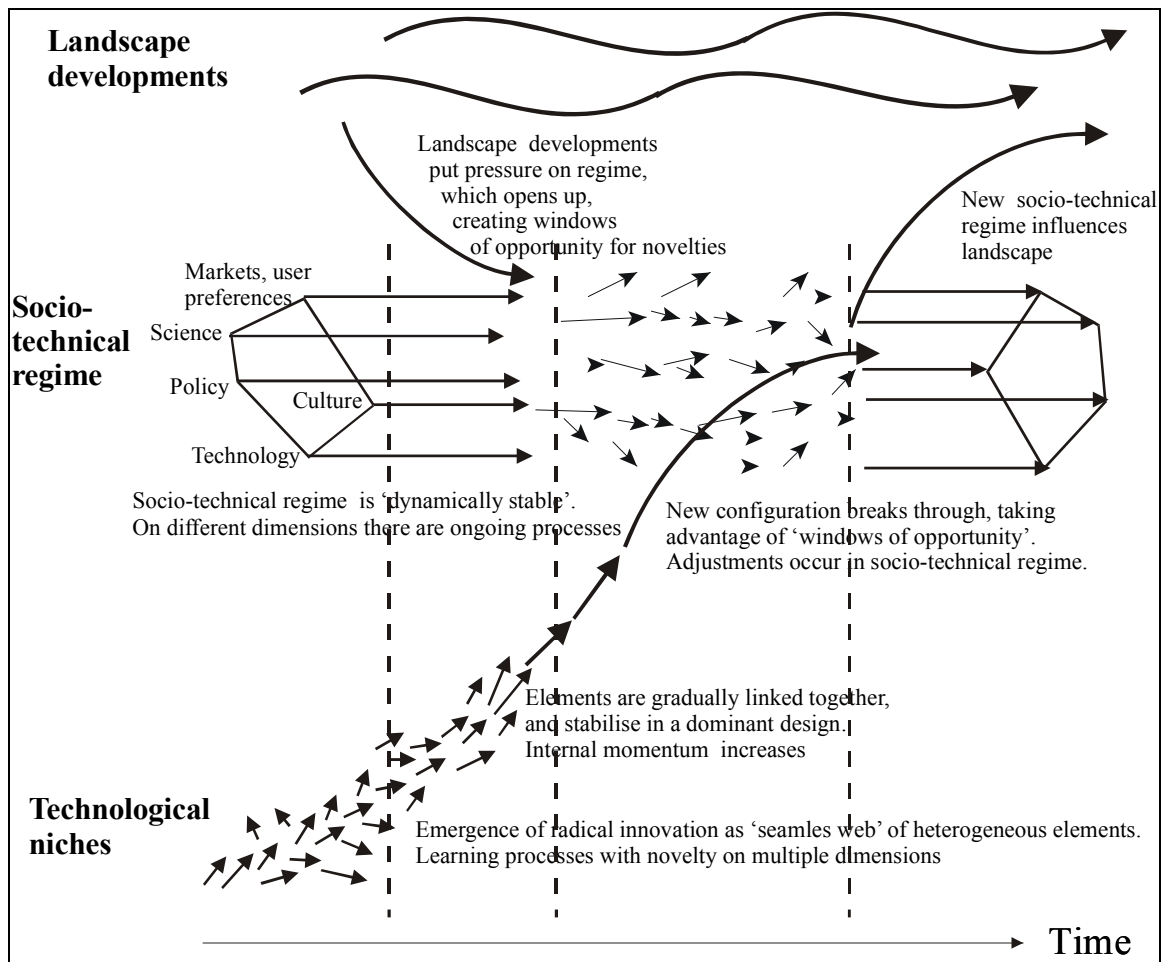
A drawback of the landscape metaphor is that it partly comes with the suggestion of relative stasis, as in its reference to soil conditions, rivers, lakes, and mountain ranges in biological evolution. We therefore also want to highlight the dynamic (atmospheric) aspects of the external environment, such as rainfall patterns, storms and lightning. In this respect, Van Driel and Schot (2005) have elaborated the landscape metaphor by distinguishing three types: 1) factors that do not change or that change only slowly, such as climate; 2) long-term changes, such as German industrialization in the late nineteenth century; and 3) rapid external shocks, such as wars or fluctuations in the price of oil. This varied set of factors can be combined in a single "landscape" category, because they form an external context that actors cannot influence in the short run. This does not mean that landscape developments occur without human agency. Urbanization, globalization, environmental problems and macro-cultural changes obviously come about through aggregations of multitudes of actions. The point, however, is that such landscape developments cannot be influenced by niche and regime actors in the particular domain that is the object of study.

Dynamic multi-level perspective:

The key point of the multi-level perspective (MLP) is that transitions come about through the interplay between processes at different levels (Figure 7). Although each transition is unique, the general dynamic is that transitions come about through the interaction between processes at different levels: a) Niche-innovations build up internal momentum, b) changes at the

landscape level create pressure on the regime, and c) destabilization of the regime creates windows of opportunity for niche-innovations.

Figure 7 **Multi-level perspective on transitions**



Source: adapted from Geels, 2002: 1236

An important implication is that the MLP does away with simple causality in transitions. There is no single 'cause' or driver. Instead, there are processes on multiple dimensions and at different levels which link up and reinforce each other ('circular causality'). The complexity of transitions can be stylized by distinguishing different phases in transitions.

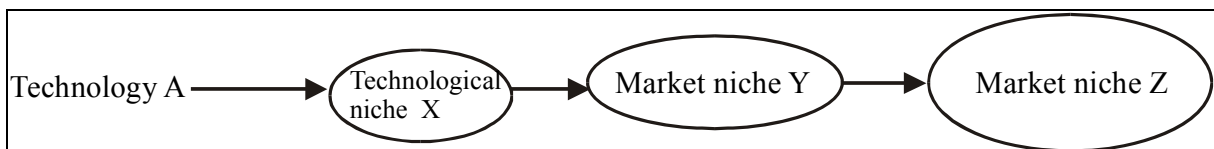
In the first phase, radical innovations emerge in niches, often outside or on the fringe of the existing regime. The social network of niche-innovators is unstable and fragile. There are no articulated rules and various technical design options co-exist, creating uncertainty (represented by diverging arrows in Figure 7). Actors improvise, engage in experiments to work out the best design and find out what users want. The niche-innovations do not (yet) form a threat to the existing regime, where trajectories continue relatively predictably.

In the second phase the innovation enters small market niches, which provide resources for further technical development and specialisation. The new technology develops a trajectory of its own and rules begin to stabilise leading to the gradual emergence of a dominant design

(represented with converging arrows in Figure 7). Users build up experience with the new technology and articulate their preferences. New technologies may remain stuck in market niches for a long time, when they face a mis-match with the existing regime. As long as the regime remains stable, niche-innovations have little chance to diffuse more widely.

The third phase is characterised by wider breakthrough of the new technology and competition with established regime. On the one hand, this depends on niche-internal drivers such as price/performance improvements, scale economies, development of complementary technologies, or support from powerful actors (e.g. diversifying firms). On the other hand, external landscape developments exert pressures on the regime leading to tensions and an 'opening up' (represented by diverging regime arrows in Figure 7), which create windows of opportunity for the diffusion of niche-innovations. The breakthrough from niche- to regime level does not take place at once, but through a sequence of steps. While the innovation is initially used in specialised technological or small market niches, it gradually captures larger market niches. Diffusion thus occurs through a process of niche-accumulation (Figure 8).

Figure 8 **Diffusion as a process of niche accumulation**



Source: Levinthal, 1998: 243

The fourth phase is characterized by technical substitution and broader (gradual) adjustments in socio-technical systems such as new infrastructures, consumer behaviour, regulations etc. The new system may eventually influence wider landscape developments.

This discussion means that there is no guarantee that transitions will succeed: niche-innovations may fail to build up sufficient momentum or suffer setbacks; tensions in existing regimes may remain small so that 'windows of opportunity' for niche-innovations do not materialize.

Theoretical and epistemological characteristics

The MLP differs from the economic models, engineering approaches and psychological studies that dominate environmental policy discussions. Rather than focusing on technology fix or behaviour change, the MLP has the following theoretical characteristics:

- a) Co-evolutionary and 'systemic' approach. Transitions are not driven by single factors (such as prices or technological change), but involve co-evolutionary developments between multiple dimensions (technology, industry, markets, consumer behaviour, policy, infrastructure, spatial arrangements and cultural meaning).
- b) Actor-based approach. The MLP focuses on strategies, perceptions, actions and interactions between firms, consumers, policymakers, public opinion, and social movements.
- c) Stability and change. The MLP encompasses stability, lock-in and resistance to change on the one hand, and (seeds for) radical (systemic) change on the other hand.

d) Complex dynamics. The MLP does not employ linear cause-and-effect relationships or simple drivers. Instead, it emphasises mutually reinforcing developments, alignments, co-evolution, innovation cascades, and knock-on effects.

Because of these characteristics, the MLP is not a 'truth machine' that automatically produces the 'right' answers when the analyst enters the data. Instead it is a heuristic framework that guides the analyst's attention to relevant questions and issues. The MLP practices the style of appreciative theorising, which Nelson and Winter (1982) characterise as developing a way of looking at phenomena, a framework of appreciation that describes variables and their relationships and gives a language for discussing these. Application of the MLP therefore requires both substantive knowledge of the empirical domain and theoretical sensitivity (and interpretive creativity) that help the analyst 'see' interesting patterns and mechanisms. The MLP represents a certain epistemological style (interpretive research), which is well suited to study uncertain and messy processes such as transitions.

4.1.3 Policy implications

Socio-technical transitions are difficult to manage and steer, because they are open, uncertain and complex processes, involving multiple social groups and co-evolution between various system elements, many of which are outside the immediate control of policymakers. The state is not an all-powerful and all-knowing actor, which can steer system innovation by pulling levers from an outside 'cockpit' point of view (Smith and Stirling, 2007). Rather, policymakers are one social group amongst others, dependent on firms (for knowledge, resources, innovation, jobs, and taxes) and wider publics (for legitimacy and consent). Furthermore, the state is not one homogenous actor, but fragmented across different domains (e.g. sectoral Ministries) and levels (e.g. international, national, local).

Although policymakers cannot steer transitions entirely at will, they do have special responsibilities and resources to shape the process. The political science literature usefully distinguishes three policy paradigms, which differ in their view on roles of policymakers, coordination processes, scientific disciplines and preferred policy instruments (Table 6). It is unlikely that system innovation can be brought about by a single policy instrument from one paradigm. Instead, shaping system innovation will entail a mix of policy instruments, which may differ between sectors and countries.

The logic of the MLP suggests policymakers should follow a two-pronged strategy if they want to influence transitions: (a) enhance the pressure on regimes through economic instruments and regulation (e.g., taxes, carbon emission trading, environmental legislation) and (b) stimulate the emergence of niche-innovations (i.e. nurture variety). Instruments from the third policy paradigm (aimed at network building and learning processes) are especially relevant to nurture niche-innovations in the early phases of transitions. Policy instruments from the other two paradigms (regulations, standards, taxes, financial incentives) are more suited to create pressure on existing regimes (and stimulate the wider diffusion of niche-innovations), which becomes relatively more important in later phases of transitions.

Table 6 **Different policy paradigms**

	Classic steering (top-down)	Market model (bottom-up)	Interactive network governance
Characterization of relationships	Hierarchical, command-and-control (government sets goals or tells actors what to do)	Autonomous (government creates incentives and 'rules of the game', which create context for autonomous actors).	Mutually dependent interactions
Characterization of coordination processes	Government coordinates through regulations, goals, targets	Incentives and price signals coordinate self-organizing actors	Coordination through social interactions and exchange of information and resources
Foundation scientific disciplines	Classic political science	Neo-classical economy	Sociology, innovation studies, neo-institutional political science
Governance instruments	Formal rules, regulations and laws	Financial incentives (subsidies, taxes)	Learning processes, demonstration projects and experiments, network management, vision building through scenario workshops, strategic conferences, and public debates

Source: adapted from De Bruijn et al., 1993

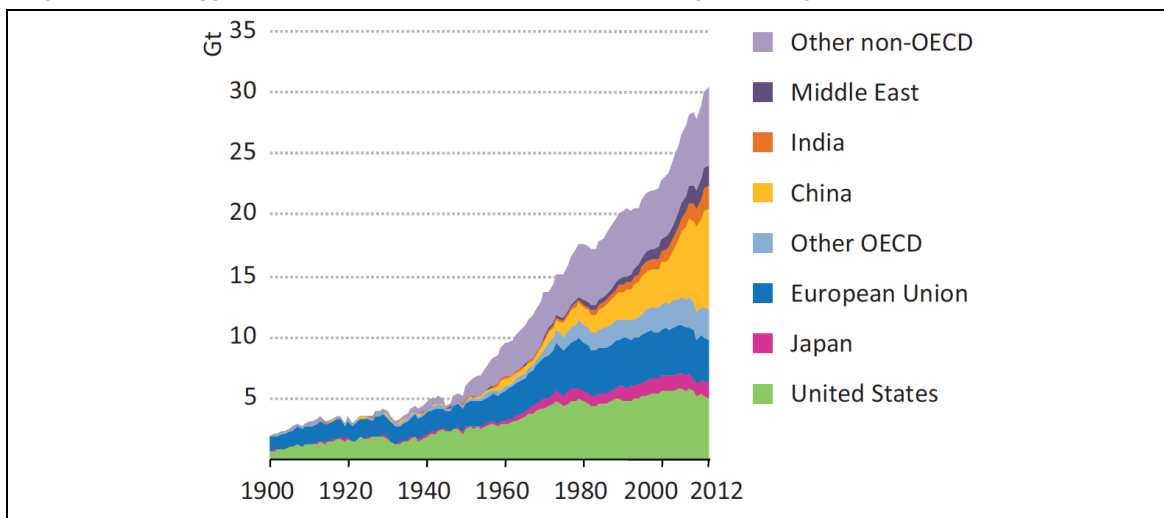
4.1.4 Real-world problems in policy implantation and sustainability transitions

Real-world policy making often differs from research-inspired policy advice. This section highlights five discrepancies between the MLP-inspired strategy for transitions policy strategy and real-world developments.

The first problem is that policy-makers currently mainly focus on the 'stimulate niche-innovation' part of the two-pronged strategy described above. There is far less willingness to 'enhance pressure on existing regimes', which would obviously go against many vested interests. For example, the European Emissions Trading Scheme, which was supposed to exert pressure on fossil-fuel regimes, is so far (8 years after its launch as Europe's flagship climate change policy) not working, with carbon prices being low and volatile. A carbon tax, which would create more predictable pressure, is strongly lobbied against, and would probably be rather low if it was implemented. In transport, the European emission regulations (fleet average emissions of 130 grams CO₂ per kilometer for new cars in 2015) can be met with incremental changes (e.g. variable valve timing, direct fuel injection), and thus exert limited pressure to seriously reorient towards cars with other propulsion technologies (e.g. fuel cells, battery-electric). There were plans to introduce tougher standards (95 grams CO₂ per kilometer in 2020), which would create more pressure on manufacturers of heavier cars. But in October 2013, strong opposition by

Germany, which has many automakers producing heavy luxury cars, led to postponement of this target to 2024, which relaxes the need to introduce radical innovations. In sum, current transition policy does not follow the advice of a two-pronged strategy. In my view, policymakers (and many academics) have too high hopes that ‘green’ innovation will be sufficient to bring about low-carbon transitions. The MLP, and various historical case studies, suggest however that stimulating niche-innovations should be complemented with increasing pressure on existing regimes. The political will (and social support) for the latter do currently not seem to exist, however. As a result, the implementation of green niche-innovations (e.g. hybrid electric cars, renewable electricity) is currently mainly *additional* (in absolute terms) to existing grey technologies, with limited substitution effects occurring. In electricity production, for instance, the global use of coal increased by 45% between 2000 and 2010, faster than non-fossil energy sources on an absolute basis. The International Energy Agency (2011:355) therefore concludes that: “For all the talk about natural gas and renewables, coal unquestionably won the energy race in the first decade of the 21st century.” The continued expansion of existing fossil-fuel based regimes (partly because of a lack of substantial policy pressure) has led to a continued rise of CO₂ emissions (Figure 9). There was a brief dent in emissions in 2009 because of the financial-economic crisis, but this was followed by very rapid increase in recent years. If present trends continue temperature increase is predicted to be between 3.5 and 5.3 degree Celsius (International Energy Agency, 2013).

Figure 9 **Energy-related carbon dioxide emissions by country**

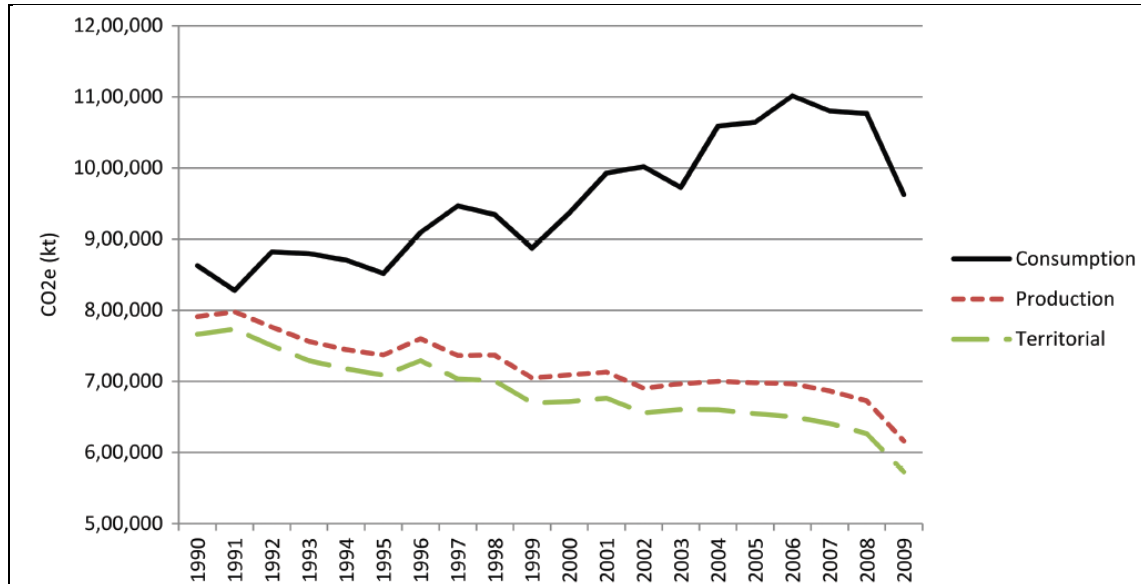


Source: International Energy Agency, 2013: 30

A positive development in Figure 9 is that emissions in the United States and Europe have decreased in the last 5 years. This is only partly related, however, to climate policies and renewable electricity (which in Europe increased from 12.2% in 1990 to 22.1% in 2011), and more due to the recession, the relocation of manufacturing industries to other countries, and the shift from coal to shale gas (in the US). Furthermore, this reduction only appears in *production-oriented* greenhouse gas assessments. On a *consumption basis*, CO₂ emissions have

continued to increase. Figure 10 shows this effect dramatically for the UK, where consumption-based greenhouse gas emissions increased by 20% between 1990 and 2008.¹³

Figure 10 **Production and consumption-based greenhouse gas emissions in the UK**



Source: Barrett et al., 2013: 454

The second (related) problem is that transitions based on Schumpeterian bottom-up technology substitution will probably occur too slowly, because diffusion processes and whole-scale system change often takes 30–40 years. So, this kind of ‘niche-driven’ transition process is unlikely to lead to a decline in greenhouse gas emissions before 2020, which climate scientists say is necessary in order to reach an 80% reduction by 2050. This reinforces the point that transitions policy should not just focus on stimulating ‘green’ alternatives, but also on preventing existing fossil-fuel reserves from being burned (or on stimulating the widespread adoption of Carbon Capture and Storage (CCS)). So, the latter means that we should start thinking about actively managed decline of existing fossil-fuel based regimes (such as coal, gas, petrol-based cars). The importance of this point is reinforced by the debate on the remaining ‘carbon budget’. Climate scientists have calculated that CO₂ concentrations should stay below 450 ppm parts per million (ppm) to have a 50% chance of staying below the 2-degree target (Berners-Lee and Clark, 2013). The remaining ‘carbon budget’ associated with 450 ppm is about 1440 Gt CO₂, of which 420 Gt has already been emitted between 2000 and 2011 (International Energy Agency, 2013). Because another 136 Gt CO₂ is estimated to be emitted from non-energy related sources before 2050 (e.g. from agriculture), the remaining budget is about 884 Gt CO₂ by 2050 (International Energy Agency, 2013). The big problem is that the world’s *proven* fossil-fuel

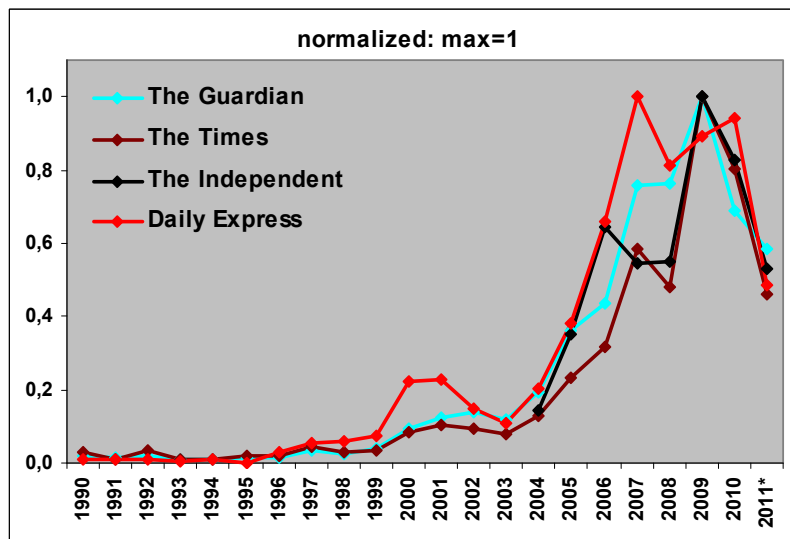
¹³ Official statistics (e.g. IPCC) measure the location of where GHG emissions are produced. The emissions related to many goods that are consumed in the UK thus do not count towards the UK, but towards the country that produces the good (e.g. China). This effect has increased with globalization in the last 20 years. The debate about production and consumption-based emissions shows the complexity of measurements and attribution of responsibility.

reserves are much larger than the 884 Gt carbon budget, namely about 2800 Gt (International Energy Agency, 2013), with about 1870 Gt coal, 610 Gt oil, and 410 Gt gas.¹⁴ This reinforces the point that the low-carbon transition challenge is not just to stimulate 'green' alternatives, but also to actively manage the decline of fossil-fuel based systems and prevent existing fossil-fuel reserves from being burned (Berners-Lee and Clark, 2013). This issue is likely to become part of heated political struggles with fossil-fuel companies, and other incumbent firms (e.g. electric utilities, car companies), in the coming decade.

The third problem relates to the need to bring the wider public along in sustainability transitions. This is instrumentally important in order to create support and legitimacy for the necessary major policy schemes (e.g. investment schemes, tough regulations, bigger subsidy schemes): "whatever can be done through the State will depend upon generating widespread political support from citizens" (Giddens, 2009: 91). Furthermore, a high degree of social urgency and demands from public opinion can offer politicians incentives to jockey for green agendas (Burnstein, 2003). Major policy shifts are therefore often accompanied by shifts in public opinion and cultural discourse, which, in turn, are shaped by social movements, media, industry associations, and special-interest groups. One problem is that many governments currently treat sustainability transitions as a technocratic management exercise, focused on some adjustments in economic frame conditions and tinkering with investment schemes (the contexts and inputs in Figure 2). These kinds of policies are not only unlikely to produce sufficient results, but also make too little attempt to include the wider public and other stakeholders. While adjustments in contexts and inputs are necessary, I don't think they will be enough to bring about transitions in the required time scale. Wider changes in governance styles may be needed, as Giddens (2009: 94) suggests: "Responding to climate change will prompt and require innovation in government itself and in the relation between the state, markets and civil society". The second problem is that the financial-economic crisis has led to decrease in public attention for climate change, as indicated by an analysis of British newspaper counts (Figure 11). Although this word-count is only a rough proxy of public attention, the general finding is corroborated by other sources such as a recent public attitudes survey (March, 2012) by the UK Department of Energy and Climate Change (DECC), which also found that economic concerns trump concerns about energy and climate change.

¹⁴ Probable reserves and possible reserves of fossil-fuels are far larger still, maybe even twenty times larger than proven reserves for coal (Berners-Lee and Clark, 2013).

Figure 11 **Yearly number of articles in UK national newspapers containing the word ‘climate change’¹⁵**



This development makes it more difficult to bring the public along and also provides opportunities to opponents to argue for a slowing down of transitions policy (e.g. by drawing attention to the costs).

The fourth problem for sustainability transitions is resistance and fight-back from existing regime actors. Regime actors in coal, gas, cars, agro-food are, of course, unlikely to roll over and die because of climate change and other sustainability pressures. Instead, they will resist and fight back through discursive, political and innovation strategies (Geels, 2014). I already mentioned the global expansion of coal. Coal regime actors also defend themselves with a new discourse around ‘clean coal’ (which many consider to be an oxymoron) and through technical innovations such as flue gas desulfurization devices, supercritical pulverised coal technologies, coal gasification, and above all, carbon capture and storage (CCS). Although CCS is technically feasible, utilities are slow to install it because of high costs. Instead, they now promise to build new-built coal plants that are ‘capture-ready’, which means to convey the intention that firms will add CCS to coal-fired plants when it becomes feasible in the future (Turnheim, 2012). Opponents see this as a flimsy promise, which the industry uses to get permits to build new coal plants. They fear that ‘capture ready’ plants may never retrofit CCS because of the high costs involved. Other fossil-fuel regimes are also repositioning themselves. Natural gas, for instance, is framing itself as a ‘bridge fuel’ towards a sustainable future, suggesting that abundant gas, opened up by the ‘shale gas revolution’, may be used to replace coal in electricity generation. While this is indeed a positive effect, which is already happening in the United States, a shift towards natural gas would lock societies into fossil fuels for another

¹⁵ The graph is based on data from a keyword search in the digital archives of these newspapers. Duplicated articles were excluded. To facilitate visual comparison between different datasets, we normalized the time series so that 1 refers to the year with the maximum number of counts.

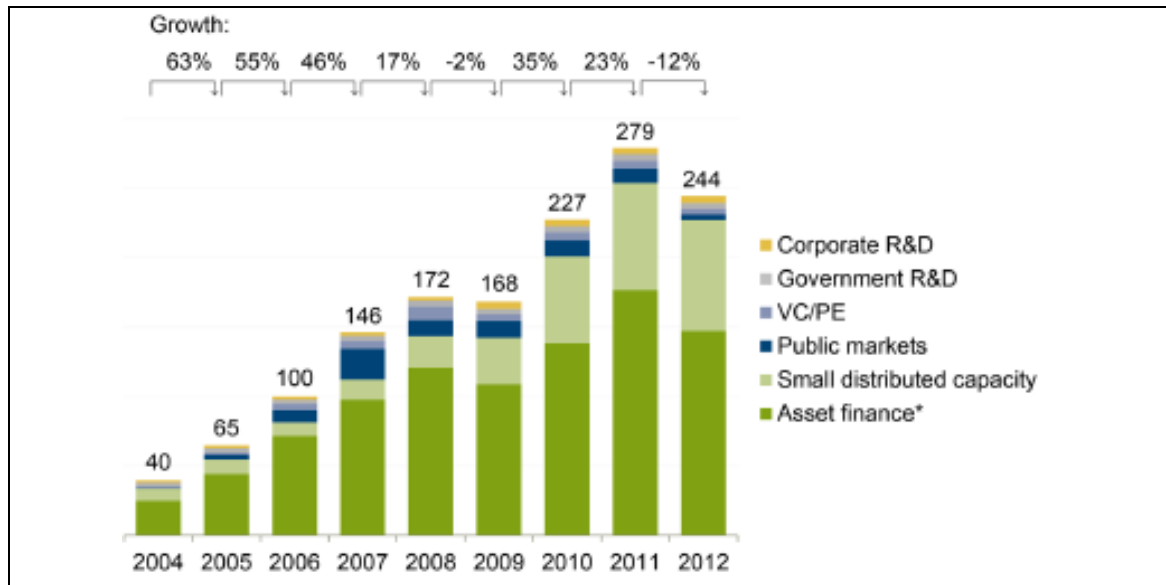
20-30 years and delay investments in renewable options.¹⁶ The oil industry also continues to renew itself, investing heavily in unconventional oil (e.g. tar sands, oil shale) and in exploring Arctic drilling.¹⁷ And although the car industry invests in alternative car propulsion (hybrid-electric, battery-electric, fuel cells), this is best seen as a hedging strategy rather than a full commitment (Penna and Geels, 2014). Their main strategy is to improve the internal combustion engine (through engine modifications and biofuels) and to sell more petrol cars in emerging economies (China, Brazil, etc.). In sum, there are very powerful industrial interests in various fossil-fuel regimes that remain committed to existing regimes and will resist major transitional change.

The fifth problem is policy uncertainty and the stalling of global investment. Many policies that stimulated the rise of renewables appear to be weakening. International climate negotiations, for instance, have stalled, when countries agreed in Durban (November 2011) to delay further talks until 2015, when they will discuss a possible international treaty that could come into force in 2020. Furthermore, many international green stimulus packages, which countries introduced during the early crisis years, have ended in 2012, which led to a decline in public grants, cheap loans and investments. Additionally, many European governments (Germany, UK, Spain, Italy) have substantially reduced feed-in-tariff subsidies to reduce government spending. And, as mentioned above, the European Emissions Trading System (ETS) is currently not driving low-carbon transitions. This down-scaling of environmental policies creates uncertainty for investors about the commitment and political will of policymakers to bring about sustainability transitions. This uncertainty, in turn, has resulted in declining global investment in renewable energy technologies by 12% in 2012 (Figure 12).

¹⁶ This effect is already noticeable in the United States, where the decrease in natural gas prices has led to a decline in renewable energy investments.

¹⁷ It is, of course, ironic that climate change (which is partly caused by burning oil) may lead to melting of North Pole ice sheets, which frees up space for oil companies to drill for more oil.

Figure 12 **Global new investment in renewable energy by asset class, 2004-2014, \$billion**



Source: based on data from Frankfurt School, 2013: 13

4.1.5 Concluding comments and possibilities for future acceleration of transitions

Assuming that Schumpeterian ‘waves of creative destruction’ hold the greatest promise with regard to green growth, this paper has developed a broader socio-technical perspective on sustainability transitions, which acknowledges the importance not only of radical niche-innovation, but also of politics, power, civil society, and resistance from existing regime actors. Some countries have begun positioning themselves as leaders in the green race. Based on a patent analysis of clean energy technologies, Veugelers (2012) suggests that Japan, United States, Germany and South Korea are green growth leaders. Combining patent data with international trade and output data (2005-2007), Fankhauser *et al.* (2013) identified the same countries, with Japan being a clear leader in green innovation. Although China is promoting seven strategies industries (including clean energy, environmental protection, and clean cars), this does not show up strongly in the green innovation data. How this green race will unfold in the coming decades is hard to predict and strongly depends on policy strategies.¹⁸

This paper has described a conceptual socio-technical perspective that may help to make sense of unfolding sustainability transitions (section 2). Green innovation is crucial in this perspective, but shaped by economic, political and socio-cultural developments in wider contexts (regime and landscape levels). The paper also discussed an abstract ideal-type policy strategy for transitions (section 3), and confronted this with five real-world developments and implementation problems (section 4): a) too high hopes that innovation will solve the problem,

¹⁸ There are indications that Denmark has lost some its green innovation strengths in the last decade, because of weakening environmental and innovation policies by right-wing governments.

and (political) unwillingness to actively destabilise existing regimes, b) time limitations (emergent bottom-up technology substitution of existing systems will take decades, which is too long according to the climate science), c) the need to avoid making low-carbon transitions a technocratic management exercise, and involve wider publics so as create legitimacy and public support (which is more difficult in these post-crisis years), d) existing regime actors are counter-mobilizing, fighting back and resisting rapid low-carbon transitions to protect their vested interests, e) policymakers are rolling back some low-carbon policies, which creates uncertainty for investors. This discussion suggests that western societies are still in the early phases of sustainability transitions, characterized by moderate momentum of green niche-innovations and resilience/resistance from regime actors.

Although sustainability transitions are experiencing difficulties (in the last 5 years) because of the financial economic crisis, they are unlikely to be permanently disrupted because the underlying environmental problems will not go away (and are likely to get worse). Future accelerations of sustainability transitions may happen in various ways.

First, acceleration may come from the groundswell of local initiatives which are beginning to articulate alternative transition pathways that focus less on 'upstream' large-scale technologies and more on reconfiguring local energy and transport systems. One such alternative pathway consists of civil society initiatives, for example the Transition Towns movement in which citizens develop local projects (e.g. low-carbon lifestyles, eco-housing projects, local car-sharing projects) in response to climate change and peak oil concerns. The Transition Town movement started in 2007 in the UK, and now claims to encompass more than 400 projects in many countries. Another example are the hundreds of community energy projects, in which local neighbourhoods develop initiatives to generate their own energy with wind turbines, solar panels, biomass digestion (Walker and Devine-Wright, 2008). Another positive trend, which is often overlooked by national governments, is that many city and local governments are working on green reconfigurations of local energy, transport and housing systems. REN-21 (2013:77) documents many such initiatives and concludes that: "Thousands of cities and towns around the world have active plans and policies to advance renewable energy. Despite the slowdown at the national level in 2012, policy momentum continued to accelerate at the local level as city governments took actions to generate employment, plan for rising energy demand, cut carbon emissions, and make cities more liveable". In the US, more than 900 US cities have signed up (by 2009) to the Climate Protection Agreement (2005), launched by the US Council of Mayors, which requires signatories to meet US Kyoto targets (7% reduction by 2012 on 1990 levels) within their own boundaries. In 2005, global megacities (e.g. Berlin, Hong Kong, Jakarta, Johannesburg, Los Angeles, London, New York City, Tokyo) created the C40 Cities Climate Leadership Group (2005), which aims to reduce GHG emissions and adapt to climate change. In Europe, there are various dedicated urban initiatives (e.g. Copenhagen's Plan to be carbon-neutral by 2025) and eco-cities (e.g. Freiburg, Graz). These urban initiatives are encouraging, firstly because they entail on-the-ground implementation and reconfiguration of concrete systems. Secondly, city governments may prove to be a new kind of actor that is less constrained by existing regimes (see below), and have the capabilities and resources to drive transitions on-the-ground.

The second possibility is that investments in national and urban infrastructure may unleash green growth. The background to this possibility is that there is plenty of money in the private sector (Zenghelis, 2012), because firms have been hoarding cash rather than spending it. The problem is that firms are not spending it because they lack investor confidence. Zenghelis (2012) suggests that governments can unleash this money using a mix of policies (pricing, regulation, institutional reform) to create certainty about future green markets. Helm (2011) further suggests that urban infrastructures (and national networks) are good green investment candidates, firstly because many infrastructures have suffered from under-investment in recent decades and need upgrading, and secondly because they need to be transformed into green directions anyway: a) electricity grids need expansion to accommodate distant renewable sources and smart ICT to accommodate intermittent electricity, b) sewers need expansion to accommodate more rainfall, c) many post-war houses are poorly insulated and need to be energy retrofitted, d) railways and light-rail systems need to be expanded to facilitate modal shift. If these investments can be linked to broader transformative initiatives, they may accelerate sustainability transitions. The financial returns for such 10-20 year investments may be somewhat lower than 'normal' investments, but their stability and predictability may be valued in periods of uncertainty.

A third possibility is that ongoing innovation and learning-by-doing improves the price/performance characteristics of green technologies (e.g. solar-PV, wind) to such an extent that they can compete with 'grey' options. Improvements have been impressive in recent years, giving grounds for hope. PV-modules, for instance, decreased from \$4 per Watt in 2008 to less than \$1 per Wp by January 2012 ([Aanesen et al., 2012](#)). Levelised costs for onshore wind turbines fell by 15% between 2009 and early 2013, while costs for offshore wind turbines rose 44% as developers moved into deeper waters (Frankfurt School, 2013). These price decreases partly reflect learning-by-doing and economies of scale, but mainly stem from increased production in China, which caused over-supply and price-dumping, which, in turn, creates pressure on environmental policies in western countries (with politicians asking 'why should we offer subsidies that end up in Chinese pockets?').

A fourth possibility is that public attention becomes more concerned again about climate change, which would create credibility pressure on policymakers. Such renewed attention could come from shocks¹⁹, new scientific findings (e.g. about fast melting of polar icecaps), or effective social movement activity.

Fifthly, sustainability transitions can accelerate if the political will to address environmental problems strengthens. This may arise from greater public pressure and a sense of urgency. Politicians may also develop greater activity if the economic opportunities of green growth become clearer and more articulated. In that sense, it is important that some countries are beginning to 'jockey for position' in the green race. When these first-mover countries are

¹⁹ The flooding of New Orleans in 2005 and Hurricane Sandy in 2012, which flooded streets, tunnels and subway lines of New York City, increased public attention to climate change in the United States.

perceived as economically successful, other countries are likely to follow. Policymakers may also become more active if the currently dominant discourse (in which environmental policies are primarily framed as costs) will be replaced by a narrative that links eco-innovation to broader benefits and motivations such as 'quality of life', (energy) security or community engagement.

The broader gist of these speculations is again to highlight that sustainability transitions and green growth are not only techno-economic challenges, but also political and socio-cultural projects, which require policymakers and academic to pay attention to a broad range of actors and stakeholders.

4.2 Gender regimes and gender policies in Europe – Searching for welfare, work and gender equality

Janneke Plantenga (Utrecht University)

4.2.1 Introduction

Welfare is not just a natural given, but also the result of deliberate action. According to Nasar (2011) this insight marks the beginning of economics as a scientific endeavour. The future is more than a whim of the gods; with the right institutions and correct kind of control, welfare can be realized. It is therefore the task of economics to find an answer to all kinds of economic disasters - from hyperinflation to recession - and so generate stability and prosperity. This 'grand pursuit' mainly focuses on the material side of welfare: full employment, economic growth and stable prices. At the same time, there is broad consensus that the concept of "welfare" must be defined broadly and also covers a fair distribution of income and equal rights.

The rise of the modern welfare state fits in with this way of thinking. The welfare state cushions the financial setbacks that result when economic growth slows down, or individuals are struck by adversity. At the same time the welfare state provides equal access to education and health care. As a result, welfare states do not only exist to relieve poverty, but also to provide insurance and to smooth consumption over the life cycle. Barr describes both purposes as the 'Robin Hood' and the 'piggy bank' function of the welfare state. The Robin Hood function is covered by "a series of institutions that provide poverty relief, redistribute income and wealth, and reduce social exclusion". The piggy bank function is covered by "a series of institutions that provide insurance and offer a mechanism for redistribution over the life cycle" (Barr 2002: 1). The argument that the welfare state has a piggy bank function that is additional to and separate from poverty relief is important. By providing income transfers in case of unemployment and old age for example, and by organizing health care and education, the resulting gains to wellbeing are enormous, covering the entire population. At the same time it has to be underlined that the structure and the scale of the welfare state are not static over time or between countries. The 'configuration' changes, not only because of new insights in (the trade-off between) efficiency and equity, but also because of a changing socio-economic reality, such as structural economic change, increased mobility, ageing, changing gender roles and changing perceptions of equality.

Perhaps one of the biggest challenges of the modern welfare state is to adapt to a system in which the point of reference is no longer the breadwinner family model with its gendered division of work and care, but rather a more individualized model in which it is presumed that both men and women are active at the labour market. The latter development is often referred to as the rise of the 'adult worker model', as it is presumed that each adult participates in the labour market according to his or her abilities (Lewis 2001; Lewis and Giullari 2005). The rise of the adult worker model has large implications for the structure of the welfare state, because it implies a change in the organization of paid and unpaid care and the presumed 'natural' gender order. Within the breadwinner family model paid work and unpaid care are strictly divided between the two adult family members, but at the same time united within the nuclear family. Within that particular model, the purpose of the welfare state is to facilitate the social division of work, by actively encouraging the feasibility of the breadwinner family. In contrast, within the adult worker model, paid and unpaid work are combined and performed by a single person: the economically independent citizen (m/f) who is responsible for the care of children or other family members in addition to being self-supporting. The welfare state that matches the adult worker model not only compensates its citizens for the loss of income, but also supports them in their attempt to gain full employment and facilitates them in combining paid and unpaid work.

A different employment model thus translates into a different configuration of the welfare state. In a breadwinner family model there is no need for parental leave or child care services; in an adult worker model social assistance for lone mothers or a breadwinner allowance for the depending partner are not appropriate. The changing patterns of work therefore demand a different social security system, a different collection of risks that have to be covered, different notions of solidarity and a different embedding of individual and collective responsibilities. Recalibrating the welfare state in accordance with changing reality is, however, a complicated business. More concrete: the adult worker model is more easily introduced in labour market policy than in the configuration of the welfare state. This may be due to intrinsic difficulties in organizing long term and large scale transitions, to budgetary constraints, or to conflicting interest and conflicting visions on the welfare state and the role of the family. In fact, although policies seem to encourage a more equal role for men and women, a more accurate characterization of the current developments might be the rise of the 'dual earner, gender specialized, family model'. This term, coined by Daly, indicates that the actual developments do not suggest an unequivocal move to an individualized adult worker model, but rather seek a middle way between the family and the individual. Daly (2011: 2). "This makes for complexity and even ambiguity in policy, a manifestation of which is that reform within countries involves concurrent moves in several directions".

In this paper we will describe the current state of affair in welfare state policy and the search for welfare, work and gender equality. The changing patterns of labour force participation within the EU and the rise of a more individualized adult worker model (4.2.2) will be the starting point. Against this background the tax regime has to be recalibrated (4.2.3.1), new welfare state arrangements have to be introduced, such as parental leave and child care services (4.2.3.2), and working hours have to be individualized (4.2.3.3). The logic and internal consistency of

these changes will then be discussed, together with the implications for gender equality (4.2.4), after which the paper will end with the most important conclusions (4.2.5).

4.2.2 Changing patterns of labour force participation

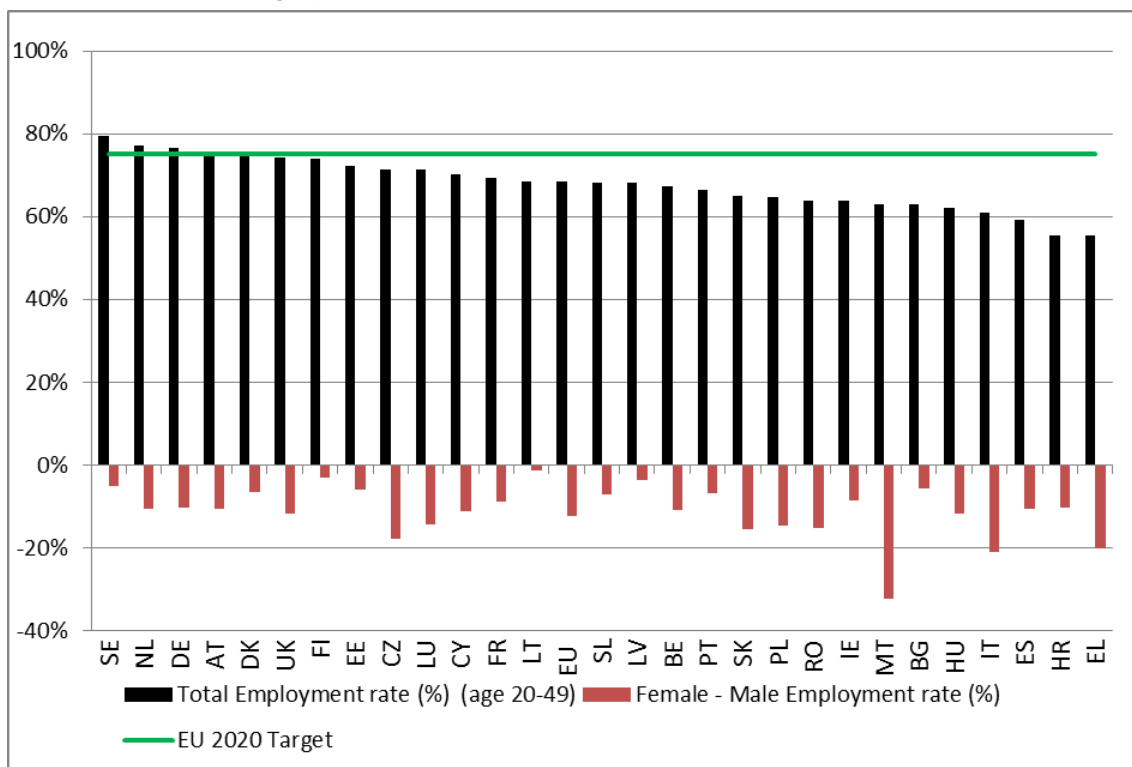
Within the full breadwinner family model, wealth and welfare implied the non labour force participation of married women. This conviction was actively supported by rules and legislation, for example by breadwinner perks in the tax system, unequal social security entitlements, exclusionary measures for women in pension schemes etc. (Janssens 1998; Land 1980; Lewis 1992). The breadwinner family model, however, no longer serves as a normative framework. Rather the emphasis is on more equal labour force participation of men and women, although the actual working hours may still differ. In effect, in western European Member State especially since the 1980's, there is a strong growth in female labour supply, inspired by higher levels of education, demographic change, the rise of the service economy and increased wage levels (Goldin 2006).

In Central and Eastern Europe, since the Second World War, there has been a strong emphasis on the dual earner model, implying high male and female labour force participation. To a certain extent it could be stated that the adult worker model had already been introduced in the Central and Eastern European Member States – given the emphasis on paid work for both men and women. At the point of transition, the female participation rate was 80% in Czechoslovakia, Estonia, Latvia, and Lithuania, and around 70% per cent in Poland, Hungary and Romania (Pascall and Lewis 2004: 375). At the same time, the socio-economic reality of men and women before the transition indicated the complexities of a model that emphasized the importance of paid work while at the same time neglecting the importance of (unpaid) care. In these instances, work did not necessary imply wealth and welfare, or gender equality. Since the 1990's, after entering the European Union, the specific history still has an impact on the welfare state configuration and the policies targeted at paid and unpaid work.

Especially at the level of the European Union the individualised adult worker model has become an important reference model, both for social and economic reasons. Within the European Employment Strategy, growing female participation is favoured as a means to promote gender equality and social inclusion, as well as to increase economic competitiveness and to broaden the tax base of the European welfare states. For this reason, the Lisbon council of 2000 has set targets for the overall employment rate of 70% and a female employment rate of 60% by 2010. In 2010 the European Commission adopted a five-year strategy for promoting equality between women and men in Europe. The strategy aims in particular to make better use of women's potential, thereby contributing to the EU's overall economic and social goals. According to the Commission, getting more women in to the labour market helps counterbalance the effects of a shrinking working-age population, thereby reducing the strain on public finances and social protection systems, widening the human capital base and raising competitiveness. The emphasis on increasing the participation rate has been continued in the Europe 2020 strategy, although the specific emphasis on increasing the female participation rate and on promoting gender equality has disappeared: the aim is simply to reach an overall employment rate of 75 per cent (20-64 years) by 2020 (EC 2010).

The current state of affairs is summarized in Figure 13, which provides data for 2012 on the overall employment rate, in combination with the gender gap in employment. From the figure it appears that among the EU Member States Sweden, the Netherlands, Germany, Austria and Denmark have already met the 2020 target of 75 per cent, with the United Kingdom and Finland close behind. Low employment rates are recorded in the Southern Member States (Italy, Spain and Greece) and some of the Eastern Member States (Bulgaria, Hungary and Croatia). Presumably these low scores are partly the result of the current economic crisis, yet also more structural aspects seem to play a role as these countries also indicate a relatively low participation rate (see Table 16 in Annex 2 for more details). Figure 13 also demonstrates that in all countries the female employment rate is lower than the male. Although the relation is not perfect, countries with a small gender employment gap are likely to have a higher overall employment rate, whereas countries with a lower employment rate are likely to record relative large gender gaps, indicating that the difference between the employment rates of men is smaller than that of women.

Figure 13 **Total employment rate (20 – 64), Female-Male employment rate (2012), and EU 2020 target, 2012**



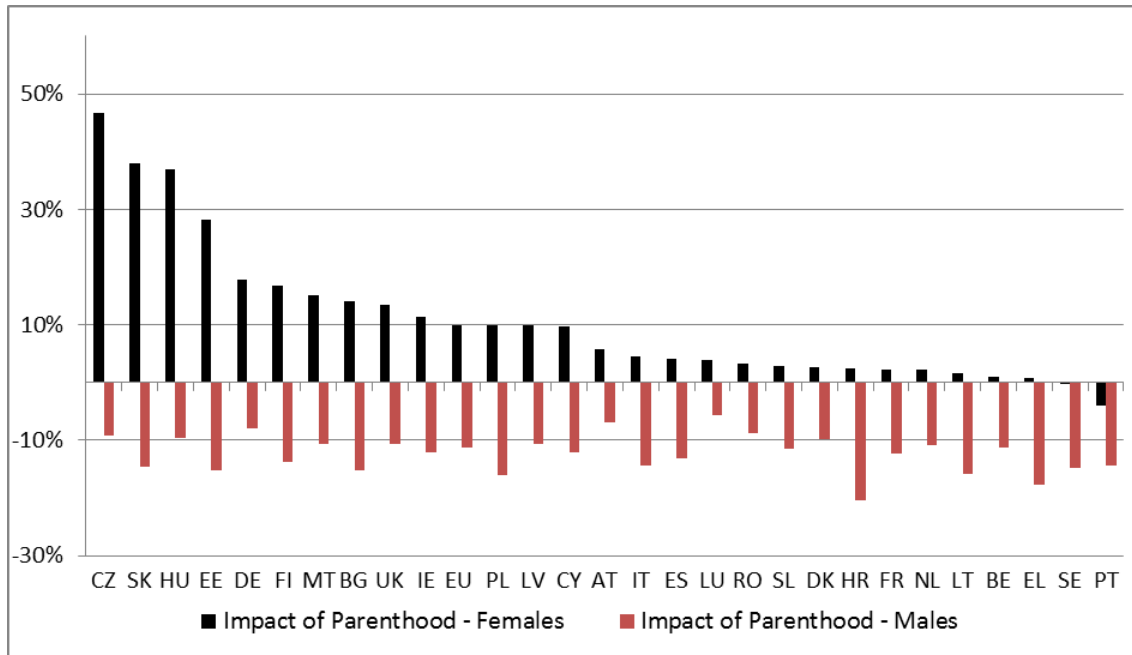
Source: Eurostat, LFS

The participate rates of Figure 13 are calculated in head counts, implying that the participation rate is not corrected for non-full-time working hours. The proportion of the EU-28 workforce in the age group 20–64 years reporting that their main job was part-time has been steadily increasing from approximately 15% in 2002 to almost 19% by 2012. By far the highest proportion of part-time workers in 2012 was found in the Netherlands (46.2%), followed by the

Denmark, Austria, Belgium, United Kingdom and Sweden, where part-time work accounted in each case for almost a quarter of those in employment. By contrast, part-time employment is relatively uncommon in Bulgaria (2.2% of employment) and Slovakia (3.9%) (see also section 4.2.3.3 of this paper and Table 20 in Annex 2). The incidence of part-time work differs significantly between men and women. According to the Labour Force Survey of 2012, just under one third (31.9%) of women aged 15–64 employed in the EU-28 worked on a part-time basis in 2012, compared to 8.4% of men. More than three quarters (76.9%) of all women employed in the Netherlands worked on a part-time basis in 2012, by far the highest rate among the EU Member States.

An important reason for the different labour market behaviour of men and women is of course the different impact of parenthood. Whereas men with children tend to work more than men without children, the opposite is true for women: women without children have higher employment rates than women with children. The different impact is illustrated in Figure 14, which compares the difference in employment rates of men and women without the presence of any children and with the presence of a child aged 0-6 within the age group 20-49. It appears that all countries indicate the same pattern: the impact of parenthood is positive for men (translating into a negative score in Figure 14), but negative for women (translating in a positive score in Figure 14), with the single exception of Portugal. However, Figure 14 also displays large differences. Whereas the impact of parenthood on the employment behaviour of men is rather similar in all Member States and hovers around minus 10 percentage points, for women the impact differs considerably. The highest figures are found in the Czech Republic (46,6 percentage points), Slovakia (38 percentage points) and Hungary (37 percentage points). In Slovenia, Denmark, Croatia, France, Netherlands, Lithuania, Belgium and Greece, the on the other hand, the difference is rather small (below 3 percentage points). Portugal is the only country where women are more employed after having children; the employment impact of parenthood on women is minus 4.1 percentage points here. Figure 14 also points out that the typical gendered division of labour in which men have the primary responsibility to earn and women to care is still valid in most EU Member States. The Czech Republic, Slovakia and Hungary are the three countries where women are most affected by parenthood, but practically all countries still follow to some extent this general pattern.

Figure 14 **Employment impact of parenthood for women and men aged 20-49, 2012**



Source: Eurostat, LFS

Summarizing this section, it seems fair to state that there is still a large gap between the EU goal of (more or less) equal employment rates of men and women and the actual employment patterns within the EU Member States. At the level of the European Union this (familiar) conclusion is translated into a continuous appeal to Member States to promote female employment. Several documents underline the importance of further measures in this respect, emphasizing the importance to assist in care responsibilities either by investing in services or by facilitating the combination of work and care. For example the EU Strategy on Gender Equality assesses the current state of affairs as follows: “The impact of parenthood on labour market participation is still very different for women and men in the EU today because women continue to shoulder a disproportionate part of the responsibilities involved in running a family. Many women feel that they still have to choose between a career and their children. Current demographic trends also mean that women and men increasingly have to care for dependants other than children over indefinite periods of time. Member States, which have put reconciliation policies in place, are seeing high numbers of both women and men in work and relatively sustainable birth rates. The EU has made recent progress in improving the overall framework for a better work/life balance. The Commission will strive for further progress in this area, paying particular attention to the availability of affordable high-quality care” (EC 2010: 4-5). This brings us to the issue of the welfare state policies and whether there is indeed a change in focus from facilitating the breadwinner family model to investing and supporting the adult worker model.

4.2.3 Welfare state policies

Recalibrating the welfare state along the lines of the adult worker model is not an easy task. Change may be frustrated because of lack of support of the adult worker model, vested interest,

lack of political strength, lack of budgetary resources (particularly in the aftermath of the recent financial and economic crisis), or divergent visions on the role of the family. In this section we will cover three important policy domains in which the transition towards the adult worker model might materialize: the tax system, the family policy (parental leave and child care) and the organisation of work and working hours. Taken together these domains should provide important evidence of the envisaged transition towards the adult working model – taking into account the gender specific division of paid and unpaid work within the traditional breadwinner model. The structure of the subsections is identical: first we cover the importance of the issue in a more theoretical way, next the related EU policy is summarized whereas the final part provides an overview of the current state of affairs in the different EU Member States.

4.2.3.1 Tax System

Taxes are an important element of the welfare state. In theory, the two main goals of levying taxes are the same as the goals for public expenditures: to promote the public interest in equity and efficiency (Tresch, 2008:36). In practice, the actual tax system will depend on perceptions about the proper role of the government, the economic situation and the overall belief system with regard to welfare, work and fairness. Stotsky (1997) refers in this respect to tax systems as reflecting ‘a tapestry of decisions’. These decisions “have been influenced by a variety of factors, including social attitudes about the respective roles of men and women. As a result, many tax systems exhibit gender bias - they treat men and women differently in ways that can negatively affect their decisions on whether and how much to work, their personal consumption habits, and their overall tax liabilities” (Stotsky 1997: 30).

Gender bias can be explicit and implicit. Explicit forms are specific provisions in the law that treat men and women differently, e.g. specific tax brackets for married women or specific breadwinner allowances for married men. Implicit forms are provisions in the law that, because of the different societal role of men and women, have different implications for men and women. Over the last decades, the explicit bias has generally been removed from current tax codes (Bettio and Verashchagina 2013). Yet implicit gender bias is still widespread. This refers in particular to the secondary earner bias and the unpaid work bias.

The secondary earner bias is the result of a tax system with some progressivity and some jointness. Bettio and Verashchagina (2013: 173) provide the following example, covering a married couple-and-child household. “Initially she stays at the home to look after the child while he works full time and earns €30,000 per year. Subsequently, she enters the labour market and earns €15,000 per year. Now consider a pure income splitting system and a two-rates tax schedule, respectively 15% up to €15,000 and 30% on higher incomes. In a pure splitting system, partners are treated as if each earns a half share of the combined income within each tax bracket. This is equivalent to multiplying the individual rate schedule by 2. Under this system a 15% tax rate would be imposed between €0 and €30,000 and a 30% rate above €30,000. The combined liability for the two spouses is now down to €9,000, as in individual taxation, but each of them contributes €4,500 despite the fact that she earns one half of what he does. Income splitting can be adjusted in order to reduce the secondary earner bias. For example, the individual tax rate may be multiplied by 1.7 instead of 2. This clearly lowers the

incidence of the secondary earner bias, but it does not remove it". In this example the secondary earned bias is the result of joint taxation. Yet, even in individualized tax system there may be a negative fiscal incentive for the secondary earner, if the fiscal system grants a non-working spouse allowance. If this allowance is lost when the secondary earner enters the labour market, this can be interpreted as an additional tax on the dual earner family (see for more details: Bettio and Verashchagina 2013).

Another indirect bias can be labeled as the paid work bias. McCaffery (2008) explains the incomplete transition towards individualised taxation by the argument that most people feel that one-earner families are treated 'unfairly' under individualized taxation and have to be compensated somehow by tax allowances or tax breaks. This is based on the *couples neutrality* principle which is fairly dominant. This principle states that a two-earner couple with the same combined earnings as a one-earner couple should pay the same amount in taxes. If the tax schedule is progressive, however, the latter pays more under individual taxation. At the same time, the couples neutrality principle assumes that within one-earner families the 'non-earner' is truly inactive, i.e. does not produce goods or services of use to the household. Yet, as McCafferty states, the 'stay at home' spouse and parent is providing tremendously valuable services, including child rearing and home care. The critical point is that "income" tax systems ignore imputed income; tax only falls on monetary income. Looked at another way, the dual earner couple has incurred child care costs to earn their income, which the one earner couple has not. Thus the norm of 'child care neutrality' could (simply) mean a general deduction for paid child care from the income tax (McCaffery 2008), indicating that both couples have earned their income under the same 'child care neutral' conditions, or rather the same 'ability to pay' (viz. Nelson 1996).

A similar argument is made by Stiglitz et al. (2009) in their report on the "Measurement of Economic Performance and Social Progress". Under the heading of 'classical GDP issues' they point to the importance of economic household activity. To illustrate this point they suggest to compare the income earned by a one earner household with two children to the income earned within a dual earner household in which both parent work full time for the same global pay. According to Stiglitz et al., most income measures treat these two households as if they have identical living standards, but obviously they don't, as the dual earner family must pay for "all the shopping, cooking, cleaning and child care out of pocket" (Stiglitz et al., 2009: 35). In short: focusing on market production provides a biased picture of living standards in general and provides biased tax systems in particular.

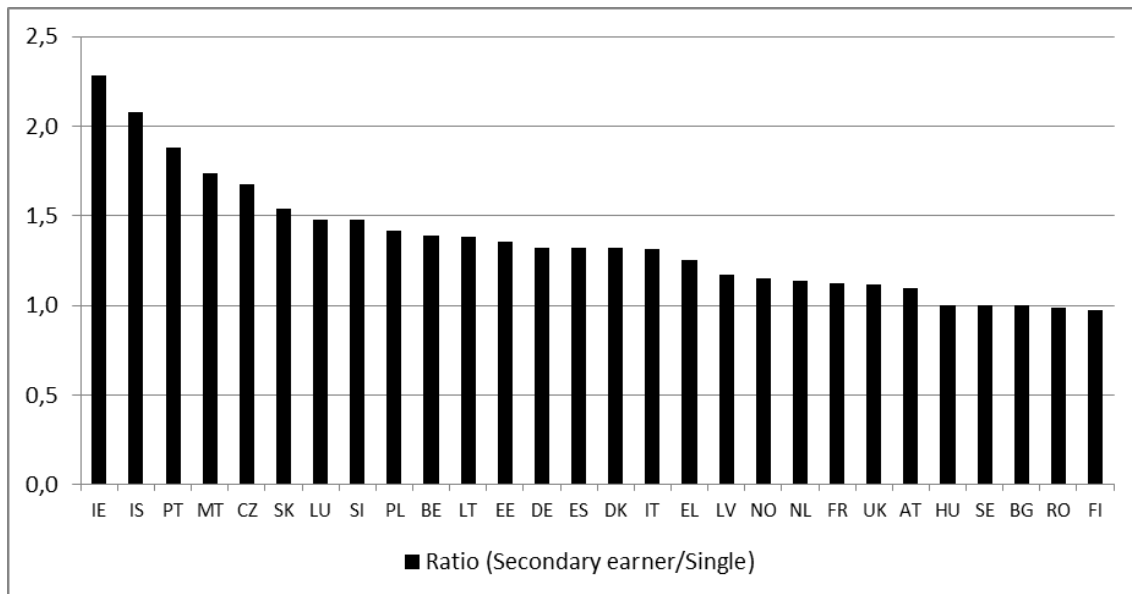
Within the EU, the tax system is seen as an important policy tool to increase the level of employment. In fact, the 1984 report of the European Commission (EC 1985) was one of the first official documents to disclose that European tax systems discouraged female labour market participation. The document puts particular blame on joint systems of taxation which manifestly favoured the traditional division of labour between a male primary earner and a female homemaker or secondary earner. Most countries now have introduced individual rather than joint taxation, yet elements of jointness are still present in the tax system of France, Germany, Ireland, Luxembourg and Portugal. In addition, the presence of other features in the tax

systems, such as deductions for one-earner households, might still translate in a biased incentive structure (Bettio and Verashchagina 2013).

In empirical research the METR and the AETR are often used as indicators to scale the different EU Member States on their fiscal incentives towards participation. The METR refers to the marginal effective tax rate and indicates the tax burden on an incremental increase in income. The higher the value of the METR, the weaker the incentive to increase working hours. The same formula can be used for larger increments and, in particular, for transition from no paid work to gainful employment at specified levels of earnings. In this case, the measure is called Average Effective Tax Rate (AETR) (Carone et al. 2004, p.10). When the transition is from inactivity to work, the AETR is also known as 'Participation Tax'. It shows the amount of additional taxes and lost benefits relative to gross earnings for a person who has just entered or re-entered work. Again the higher the AETR the lower the incentive to participate in paid work (see also Bettio and Verashchagina 2013: 180)

Following the approach of Jaumotte (2003) we use the ratio of the AETR corresponding to a secondary earner in a household with two children and the net average tax rate accruing to a single person with the same level of income. Choosing the specific ratio as an indicator makes it possible to discern the extent of the relative disincentive of becoming employed that secondary earners face compared to equal-earning singles. The ratio is calculated for a family with two children of which the primary earner has an income of 100% of average earnings and the secondary earns 67% of average earnings. In the case of equal fiscal treatment of secondary earners and singles with the same level of income the calculated ratio should be equal to one.

Figure 15 **Fiscal (dis)incentives for secondary earners at 67% of average earnings (2011)**



Source: European Commission (2013); OECD (2013), and OECD (2011)

The results, summarized in Figure 15, seem to indicate, however, that in most countries the ratio is higher than 1, although a few countries score indeed 'neutral' in this respect: Hungary,

Sweden, Bulgaria, Romania, and Finland. Norway, The Netherlands, France, UK and Austria indicate a relative minor disincentive effect with a score of 1.1. The highest score among the EU Member States are to be found in Ireland (2.3), Portugal (1.9) and Malta (1.7) (see for more details Table 17 in Annex 2). Figure 15 also indicates that the AETR scores for countries with joint taxation systems (France, Germany, Ireland, Luxembourg and Portugal) are on average indeed higher than the rest; the (unweighted) average ratio for countries with joint taxation is 1.4, compared to 1.3 for the other countries (see Table 17 in Annex 2). This is in line with expected discriminatory treatment of secondary earners in these systems, although the differences are not very large.

The overall outcome seems to be in line with the outcomes of Jaumotte (2003), covering the situation in 2000-2001, although the relative ranking differs. When interpreting the data it should be kept in mind that the ranking is only based on the two-child-dual earner family in which 'he' earns 100% of average earnings, while 'she' earns 67%; the result might differ for higher income categories for example and for different (more equal) income constellations. McCaffery (2008) refers in this respect to the dazzling complexity of the tax and transfer system: the 'fog of tax' is not likely to result in very consistent effects.

Summarizing these results, it appears that the tax systems of most member states still feature rules and practices that discourage secondary earners either to participate at all or to increase the number of working hours. In addition, the child care costs could be interpreted as an implicit tax on the secondary earner, which in most member states is not fully recognized. This brings us to the issue of the care infrastructure and the nature and scope of family policy.

4.2.3.2 Family policy

The vision of the welfare state as providing income security by way of taxes and benefits is rather traditional. Especially within the context of the changing labour market behaviour of women, the welfare state has been redesigned as focusing not only on income transfers, but also on providing (public) services. Within this context, the concept of new social risks has been introduced. According to Bonoli (2005), new social risks relate to the social economic transformations that have brought the post-industrial society into existence: the tertiarization of employment and the massive entry of women into the labour force. New social risks (NSR) therefore include – among others - reconciling work and family life, single parenthood and having a frail relative. These new social risks are not to be solved by risk sharing or income reallocation, but rather by investing in a certain social infrastructure, which provides (single) parents with the opportunities to reconcile work and family life. This also implies that the function of the welfare state shifts from a rather passive instrument aiming at income maintenance in case of non-participation, towards a more active instrument aiming at investing in and facilitating citizens towards full labour force participation. Within the context of this paper, the focus will be on two important strands of family policy: parental leave and services.

Parental leave

Entitlements to job-protected leave for parents are, according to Kamerman and Moss (2009:1) “a necessary part of the tool-kit for running a modern state”. After an early start in Germany in 1883, the ILO adopted the first Maternity Protection Convention in 1919, specifying a right to paid maternity leave of 12 weeks. The main focus is here on the protection of the health of the mother and the newborn infant. Gradually, this right to paid maternity leave was implemented across most industrialised countries (Neyer, 2003; Bennet and Taylor, 2006). Especially since the 1970, parental leave entitlements have been significantly expanded. The focus here is to enable working parents to spend time on caring for their young children. In line with this, parental leave is available for both parents, usually following on from maternity leave. In addition to parental leave, against the background of increasing dual earner families, other forms of leave have emerged like paternity leave, targeted towards fathers, and leave to care for sick children or relatives.

From an economic point of view, leave legislation has firstly been studied from the perspective of the health and well-being of mothers and the new-born child (Ruhm, 2000) and - slightly later - from the perspective of the fertility rate (Gauthier, 2007, Lalive and Zweimuller, 2009). With the introduction of extensive leave legislation, more and more research focuses on the impact of leave (or rather the take up of leave) on of labour force participation (both in rates and in hours worked), on the relative wage rate and on the share of women in high-level occupations.

The labour market impact of leave can be studied from two different angles (Evertsson and Duvander, (2011); Akgündüz and Plantenga, 2013). From a standard (human capital) approach, leave policies imply a subsidy on leisure time, resulting in an increase of the amount of time the mothers (parents) remain at home and as such in a decrease of the overall participation rate. The alternative argument predicts more positive results on the basis of a transaction cost argument: parental leave facilitates the return to the labour market after a period of non-participation, will limit the loss of human capital and will limit the search costs after a period of non-participation. Depending on the starting point, and whether the ‘default’ is uninterrupted or rather interrupted labour force participation leave legislation might therefore either increase or decrease the amount of time mother (parents) spend at home (Klerman and Leibowitz, 1997).

Empirical research seems to indicate that the labour market effects of leave might indeed be positive, but only if the leave is not too extensive. In one of the earlier studies, Ruhm (1998) for example finds evidence that paid parental leave increases the female employment rate. This result is confirmed by Jaumotte (2003) who finds that the female employment rate increases in response to leave legislation. Yet the positive effects diminish as leave duration increases. Jaumotte (2003: 93): “Taking parental leave for an extended period of time may deteriorate labour market skills, and damage future career paths and earnings. Beyond 20 weeks, the marginal effect of additional parental leave on female participation appears to become negative”. The results of Hegewish and Gornick (2011) seem a bit more nuanced: Job-protective schemes increase the labor force participation of women, almost irrespective of the length of leave; long leaves may led to wage penalties however, although the results indicated a marked variation across countries. In a recent study, Akgündüz and Plantenga (2013) also find an increase in participation rates that diminishes with length and generosity of leave schemes.

Thirty weeks of parental leave is estimated to decrease the share of women in high-level occupations by 1.5% and to lower the wages by more than 7%. In short, from a purely labour market perspective there is a rather strong case for maternal and parental leave for approximately 6 months. Beyond that level, leave may have an adverse effect on the return rate, have a negative impact on wages and the extent of vertical segregation (Mandel and Semyonov 2005).

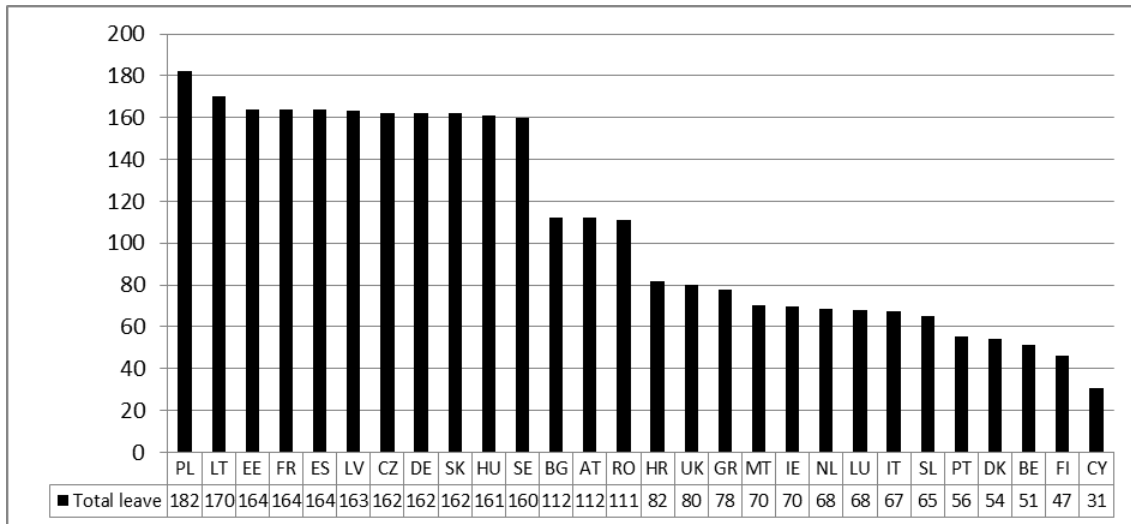
At the level of the EU, in June 1996, a directive of the European Council has been adapted which obliges member states to introduce legislation on parental leave that will enable parents to care full-time for their child over a period of three months. In principle this refers to an individual, non-transferable entitlement. This directive ensures that a certain minimum standard is guaranteed within the member states. In 2010 the European Council decided that the individual entitlement will be extended to four months. In order to stimulate a more equal take up of leave by men and women, and as such promote equal opportunities, at least one of the four months will have to be non-transferable. Moreover, the Directive states that Member States and/or social partners have to take measures to ensure that workers, when returning from parental leave, may request changes to their working hours and/or patterns for a set period of time. Employers should consider and respond to such requests, taking into account both employers' and workers' needs. The new Directive had to be implemented in 2012 at the latest (CEU 2010).

Over and above the European Directive, there is a broad range of national regulations with EU Member States differing as to duration, replacement ratios, flexibility and entitlement. The duration, for example, ranges from three months in some countries, to the period until the child's third birthday in others. Regarding the replacement ratios, in some countries the leave is unpaid, whereas in others leave takers are compensated with lump sum transfers or with transfers dependent on their former income. In addition to differences in length and level of payment, parental leave can be organised along family or individual lines. If the former is used as the basis, parents can decide who will make use of the parental leave allocated to the family. If both parents have an individual, non-transferable entitlement to parental leave, then both can claim a certain period of leave. If one parent does not take advantage of this entitlement the right expires. Especially in the Central and Eastern European Member States the parental leave is often framed as a family right (see for more details on leave entitlements Plantenga and Remery 2005; Fagan and Hebson 2006; Moss 2012; see also Ray et al. 2010 for more details on the extent to which policy designs are gender egalitarian).

Figure 16 and Figure 17 illustrate the large diversity in leave legislation (see Table 18 in Annex 2 for more details). If all the leave entitlements (maternity, paternity and parental) per household are added, and the countries are ranked solely on the length of the entitlements, then 11 countries appear to provide leave entitlements for more than 160 weeks: Poland, Lithuania, Estonia, France, Spain, Latvia, Czech Republic, Germany, Slovakia, Hungary and Sweden. Yet, as this indicator does not take into account the actual payment level, the practical impact of leave legislation in the life of working parents may be overrated. Therefore Figure 17 compares national policies on the basis of an indicator in which the length of the leave entitlements is weighted by the payment level. This indicator gives the number of weeks of maternity, paternity

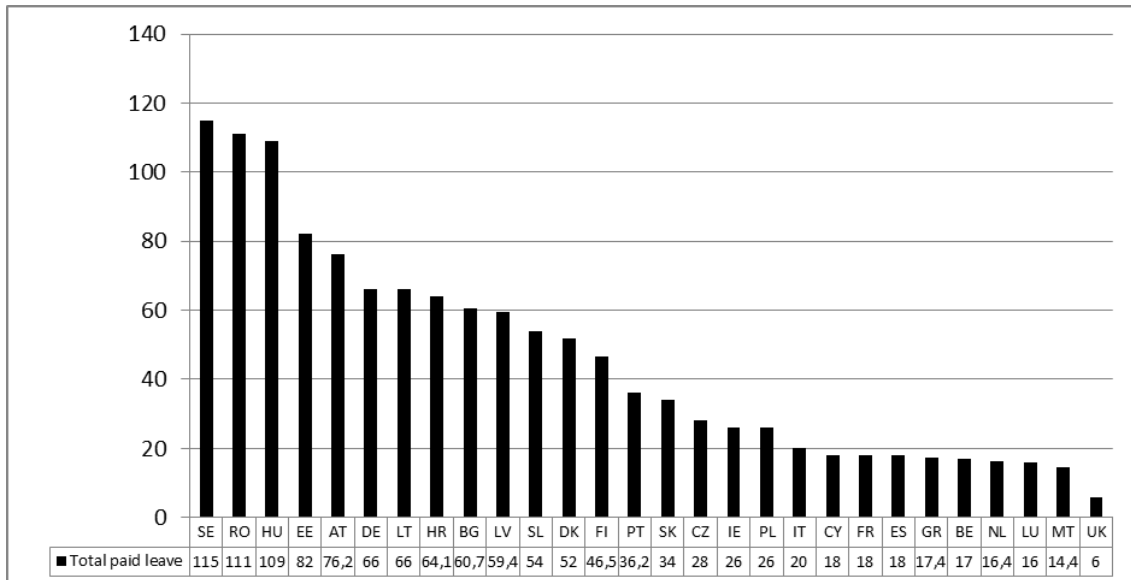
and parental leave with benefits replacing at least two thirds of salary. On the basis of this indicator, three countries indicate an effective leave of more than 100 weeks: Sweden, Romania and Hungary. At the lower end of the ranking there is Netherlands, Luxembourg, Malta and the UK with a score of 16 weeks or below. On the basis of this indicator, Czech Republic, Ireland and Poland seem to indicate the theoretical optimum (at least from an employment point of view) by provide 28-26 weeks of effective leave.

Figure 16 **Total leave entitlement in weeks, 2012**



Source: see Table 18 in Annex 2

Figure 17 **Total effective leave entitlement (benefits at least 2/3 of salary) in weeks, 2012**



Source: see Table 18 in Annex 2

The actual scores in Figure 16 and Figure 17 seem to indicate that the actual design of the leave policy is inspired by more (or: other) considerations than just the female labour supply. Raising the fertility rate might be one argument, protected family life another. More in general it seems that the equal opportunities aspect of parental leaves should not be overstated. The fact that leave regulations imply by definition distance from the labour market and instead facilitate (care) time makes their regulations sensitive to the risk of reinforcing traditional options relating to care and work (Bruning and Plantenga, 1999; Ray et al., 2010).

Child care services

The next element of family policy refers to child care services. To the extent that care responsibilities constitute a major obstacle to full employment, child care services should be rated as an important element of the adult worker model. According to Pascall and Lewis (2004: 385): “they set limits to care responsibilities for individuals, moderating unpaid care, and giving time for paid work, for careers to earn incomes and pensions”. In most European countries, day care facilities appeared in the second half of the 19th century. Large textile mills for example opened up day care centers to attract and support female workforce (Plantenga, 1993). Churches or private welfare organisations might also be involved in these early initiatives to provide assistance and care for the working poor. During the 19th century there is a growing emphasis on the importance of education of the youngest children; pedagogues like Fröbel introduce the kindergarten which will become a well-integrated part of the educational system. Nurseries, however, or more general child care facilities for the children up to 3 are much more contested and are in general not part of the social infrastructure. It is only since the rise of female labour supply during the last decade of the 20th century that countries start to invest in child care services (Kamerling, 2006).

According to Jaumotte (2003) there are basically three arguments that justify child care subsidies: where tax and benefits system distort female labour supply; in case of a compressed wage structure; and when imperfections in credit markets are present: “In the first instance, childcare subsidies help reduce the effective tax burden on mothers, whose labour supply is more elastic to the marginal tax rate (...). In the second case, the compressed wage structure raises the wages of carers (who tend to be concentrated at the bottom of the wage distribution) relative to those of mothers and thereby reduces access of mothers to childcare (wages are the main component of childcare costs). The case that imperfections in the credit market justify subsidised childcare is limited to low-income families. Credit market imperfections may prevent women in low-income families from borrowing against future earnings to finance childcare and break away from welfare dependence (...)” (Jaumotte 2003: 9).

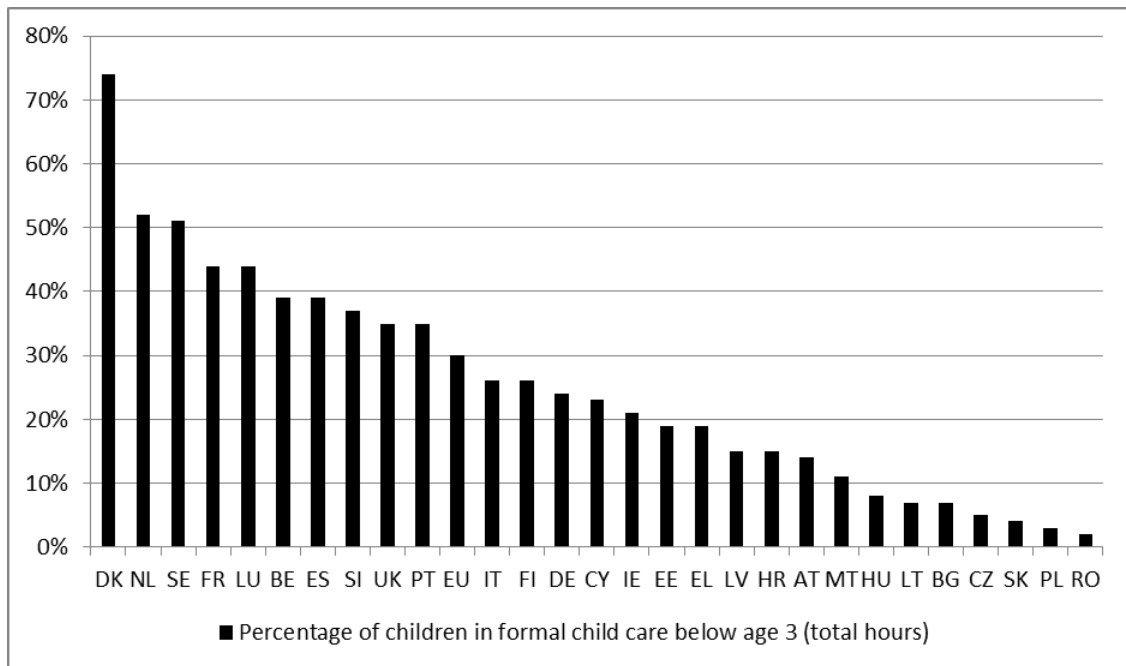
In fact, the labour market effects of child care facilities are rather straightforward and many cross-country studies point out that the availability and affordability of childcare services is positively associated with the participation and employment rate of women (Del Boca, et al., 2009; Jaumotte, 2003; Thévenon, 2013). At the same time, Blau and Currie (2006) provide a survey of the literature on the effects of child care prices on employment, indicating a large

variety in elasticities (ranging from 0 to -1). Lowering child care prices might indeed not always translate into higher employment rates but rather crowd out informal care arrangements.

The importance of affordable and accessible quality childcare provision has been recognized by the European Council and the European Union at a rather early stage. In March 1992 the Council of the EU passed a recommendation on childcare to the effect that Member States “should take and/or progressively encourage initiatives to enable women and men to reconcile their occupational, family and upbringing responsibilities arising for the care of children” (CEU, 1992). Ten years later, at the 2002 Barcelona summit, the aims were formulated more explicitly and targets were set with regard to childcare. Confirming the goal of full employment, the European Council agreed that member states should remove disincentives to female labor force participation and strive, taking into account the demand for childcare facilities and in line with national patterns of provisions, to provide childcare by 2010 for at least 90% of children between 3 years old and the mandatory school age and at least 33% of children under 3 years of age.

The Barcelona targets are set within the context of the European Employment Strategy. This means that they should be interpreted as a policy marker; as an important goal to be reached in the near future. However, the targets are not obligatory; there is no sanction on non-compliance. In fact most countries have not yet reached the Barcelona targets; the current state of affairs with regard to the youngest age category is summarized in Figure 18, which provides data on the share of children below the age of 3 which is taken care for in a formal arrangement other than the family as a proportion of all children of the same age group. Formal arrangements in this context cover the following services: pre-school or equivalent, compulsory education, centre-based services outside school hours, a collective crèche or another day-care centre including family day care organised/controlled by a public or private structure. As such it is the most important indicator to monitor the provision of child care facilities in the different Member States (see also Table 19 in Annex 2 for further details).

Figure 18 **Children using formal care as a percentage of all children (total hours), 2012**



Source: Eurostat, EU-SILC

From the figure it appears that for the usage of formal childcare, Denmark scores the highest with 74% of all children in the age category until 3 years making use of formal childcare facilities. The difference between Denmark and the second highest scoring country, the Netherlands (with 52%) is quite significant with a 22% percentage point difference. Looking at the grouping of countries a rather clear pattern emerges. At the higher end of the scale, predominantly Scandinavian and North-European countries are found, Denmark, Sweden, Netherlands, France and Luxembourg. At the lower end, Eastern European countries can be found: Hungary, Lithuania, Bulgaria, Slovakia, Poland and Romania all score below 10%. The cross-country diversity further increases when also the hours of child care use are taken into account (see Table 19 in Annex 2 for details). In several countries, such as the Baltic States, but also in Slovenia, Slovakia, Denmark, Finland, Greece and Portugal, most formal child care services are used for 30 hours or more. In other countries, however, part-time use is more common. Examples include Austria, Czech Republic, the Netherlands, Ireland and United Kingdom.

Information on the use of childcare facilities is helpful in order to assess the relative importance of this particular element of family policy. It does not, however, answer the question of whether demand is fully met. The actual demand for childcare is influenced by the participation rate of parents (mothers), levels of unemployment, the length of parental leave, the opening hours of schools, and the availability of alternatives such as grandparents and/or other (informal) arrangements. In Finland, for example, the coverage rate of formal arrangements for the youngest age category is, according to Figure 18, 26 per cent, which is well below the Barcelona target of 33 per cent. Yet, childcare facilities are not in short supply. In fact, since 1990, Finnish children under the age of three are guaranteed a municipal childcare place,

irrespective of the labour market status of the parents. In 1996, this right is expanded to cover all children under school age. This entitlement complements the home care allowance system which enables the parent to stay at home to care for his/her child with full job security until the child is three years old. Partly due to the popularity of the home care alternative, the supply of public day-care services has met the demand since the turn of the 1990s (Plantenga and Remery, 2009).

The Finnish case is a clear example of a 'parental choice' policy, which has become more dominant over the last decade. Also in France, for example, the policy logic is that parents should be able to choose. Letablier (2005): "Mothers who prefer working should be supported in their choice with a set of child care facilities, either in cash or kind, at a reasonable cost and of good quality.(...) But it is assumed also that mothers who prefer caring for their young children should have to opportunity to do so, in terms of labour rights as well as in terms of social rights. (...) the result is a complex and ambiguous mix of measures". Another example refers to Germany where the debate on parental choice was inspired by the promise made in 2006 by the Grand Coalition government to offer subsidized child-care starting in 2013. The motivation behind this promise was to facilitate the combination of work and family life by bridging the gap between the parental leave entitlement ('Elterngeld') which is received until the child is 12-14 months old and the publicly subsidized Kindergartens which are available from the age of 3 (Pauls, 2013; Heineman, 2013). In 2013, partly because of political pressure, and partly because of the foreseen deficit of day care facilities, a child care allowance was introduced to be paid to parents who are not making use of subsidized child care. The argument on the side of the proponents of the 'Betreuungsgeld' is that the government should respect the choice of parents and provide them with equivalent financial support.

Under the surface of this debate are conflicting perspectives on gender equality, social, cultural integration and regional differences. Creating parental choice is likely to translate in different labour market outcomes for different groups of women, as high-skilled (highly educated) women are most likely to take their child to day-care since they have a higher earning power and their opportunity costs of being a full-time mother are higher. Conversely, low-skilled (less educated) women are more likely to take the monthly payment since their earning power is lower. Furthermore, women from immigrant families may be overrepresented in the latter group. Consequently, the proposed policy might have detrimental effects in the sense that it would hinder the career prospects and future earning power of the already disadvantaged low-skilled and less educated women, while it might also hinder the integration of migrant families which might also lead to additional costs in later stages of education. Whether these negative outcomes will indeed materialize depends on the actual take up of the program, which depends to a large extent on the level of the home care allowance and the availability of alternatives (see also Ellingsaeter 2012; Plantenga and Remery 2009: 60-61).

4.2.3.3 Organisation of work and working hours

The final policy domain refers to the organization of work and working hours. Based on the breadwinner model, especially after World War II, working hours in the industrialized countries were largely shaped by the eight-hour workday and 40-hour work week (Bosch et al., 1994;

Bosch, 1999; Costa, 2000; Messenger, 2010). Yet, starting in the last decades of the 20th century there is a shift from jobs organised on a relatively permanent and full time basis, towards less standard, flexible and part-time employment. This trend towards more flexibility has been partly inspired by the growing diversity in life styles and the transition towards a more individualized adult worker model. Women especially have expressed their interests in tailor-made working hours matching their personal needs for flexibility (Plantenga, 2004; Merens, 2008).

Studying cross-country differences in working hours from a gender equality perspective, Rubery et al. (1998) refer to the impact of the national working time regime. Differences in working time between men and women arise primarily from the unequal division of paid and unpaid work, but the extent and form that those differences take in the labour market are moderated or mediated by national working time regimes, defined as “the national set of legal, voluntary and customary regulations which influence working time practice” (Rubery et al 1998: 72). Working time regimes can promote or diminish differences between men and women by limiting or extending fulltime working hours, by promoting or discourage part-time work and by influencing the terms and conditions under which overtime, unsocial hours or atypical employment contracts are undertaken. In practice this means that the focus is on flexibility in working hours and the flexibility in the organisation of working time (Bielenski et al., 2002; Messenger, 2010). Within the context of this paper we will mainly focus on the availability of part-time work.

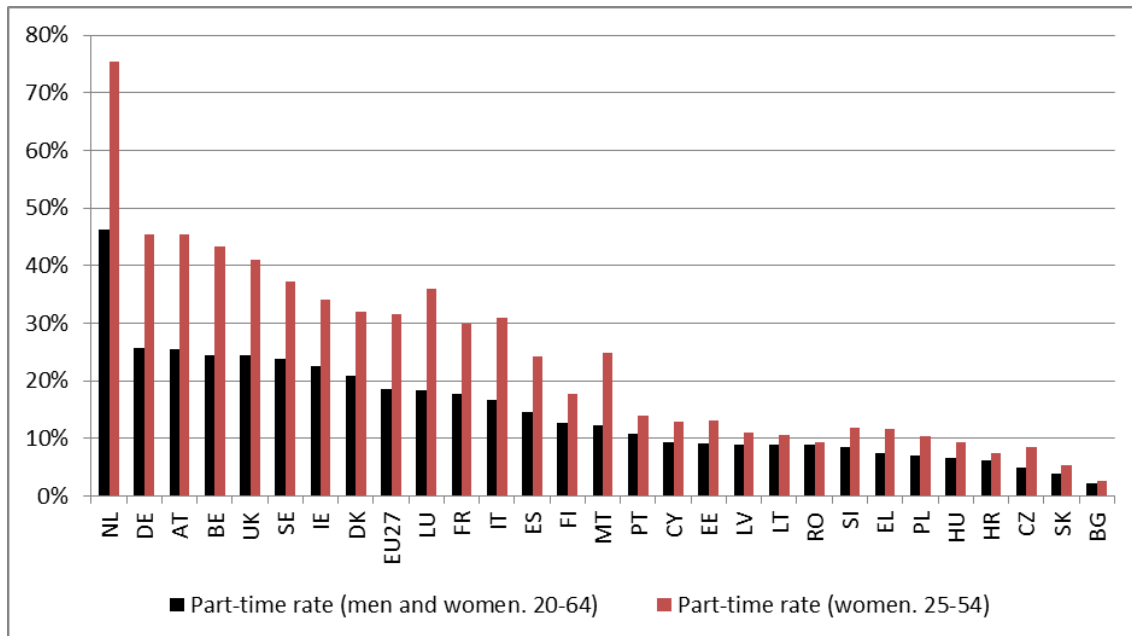
At the level of the EU, there is no generally binding regulation which entitles employees to part-time work, but Directive 97/81/EC calls upon the member states to ensure equal treatment of full-timers and part-timers unless there are objective reasons to treat them differently. The aim of the Directive is to increase the quality of part-time jobs and to facilitate access to part-time work for men and women in order to prepare for retirement, reconcile professional and family life and take up education and training opportunities to improve skills and career opportunities (CEU 1998). Though it does not entitle all employees to part-time work, several countries have developed national legislation in this respect. In some countries, such as Germany and the Netherlands, (the majority of) employees are entitled to work part-time. In other countries, including for example Estonia and Austria, entitlements are limited to employees with care responsibilities (see for an overview Plantenga and Remery, 2010).

Figure 19 provides data for 2012 on the overall part-time rate (as % of all employees aged 20-64) and the share of the female employees working part-time (as % of all female employees aged 25-54) (see Table 20 in Annex 2 for further details). The highest part-time rate is found in the Netherlands with an overall score of 46,2% and an amazing 75,4% for women. Germany, Austria, Belgium and the United Kingdom also have relatively high (female) part-time rates. In thirteen, all East or South European countries, the overall part-time rate is less than 10%, with the lowest rates being found in Czech Republic, Slovakia and Bulgaria. Apparently, these labour markets are still rather traditionally organised around a 40-hours working week. The large cross-country differences may be related to different supply and demand factors, like (at the supply side) the fiscal system and the lack of child care services, or (at the demand side) the economic structure; the demand for part-time employees is likely to increase in a service economy (Jaumotte, 2003).

Figure 19 also illustrates that part-time work is mainly taken up by women; in all countries the female part-time rate is higher than the overall part-time rate. This female dominance creates some uneasiness about the relationship between gender equality and non-standard (part-time) working hours. A high part-time rate might on the one hand be seen as a factor which contributes to a differentiated economy, offering labour market opportunities in periods of care and /or educational responsibilities. Yet, if women engage disproportionately in part-time work (or other non-standard working time arrangement) the result might be enduring gender inequality in terms of income, responsibility and power. This is especially the case when part-time work is involuntary, i.e. when employees are not able to find full time work. The share of voluntary part-time work, as summarized in Figure 20, is therefore an important additional indicator to assess the change in the actual working time regime. Figure 20 indicates that in twelve EU Member States the share of voluntary part-time work is (close to) 80% or more. In six countries (Cyprus, Romania, Italy, Spain, Greece and Bulgaria) the share of voluntary part-time work is less than 50%.

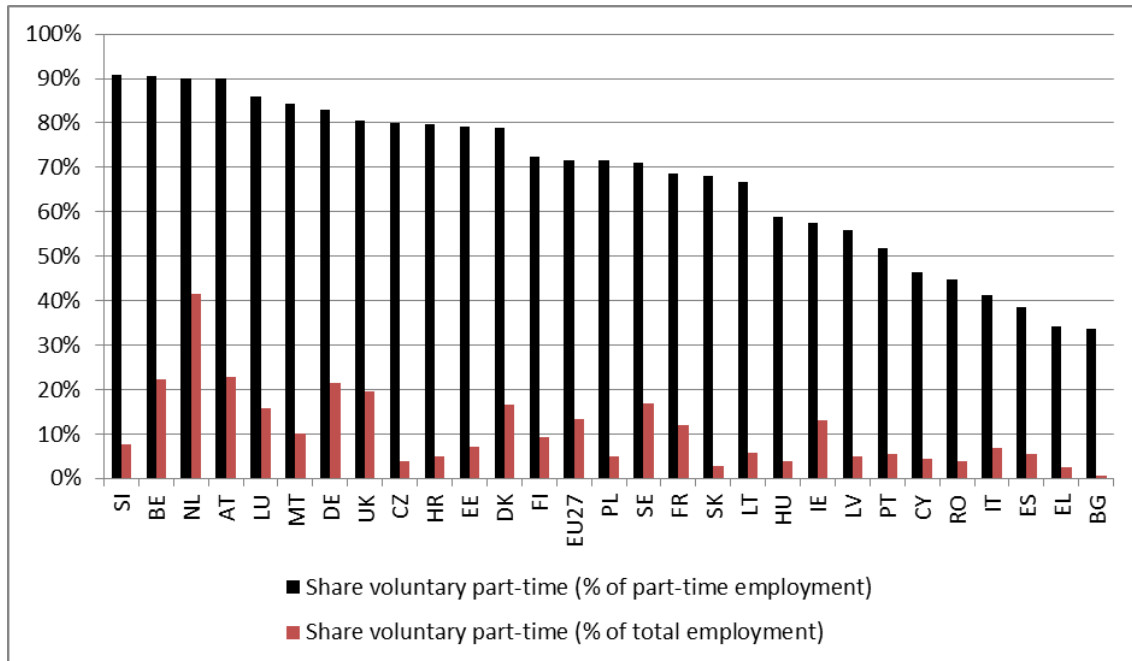
Combining the information of Figure 19 and Figure 20 seems to suggest a positive relationship between the level of part-time employment and the share of voluntary part-time work. The most clear-cut examples are the Netherlands with the highest part-time level and one of the highest share of voluntary part-time work and Bulgaria with one of the lowest levels of part-time employment and the lowest share of voluntary part-time work. Presumably the institutional context of part-time work plays an important role in this respect. In countries with a relatively high part-time rate, part-time work is more likely to be well regulated and well accepted (Plantenga and Remery 2010).

Figure 19 **Overall and female part-time rates, 2012**



Source: Eurostat, LFS

Figure 20 **Share of voluntary part-time work, 2012**



Source: Eurostat, LFS

4.2.3.4 Summary

So far, this section has illustrated the changing reality of men and women within the EU member states and – more in particular – the search for welfare state arrangements in line with the more equal role of men and women in the economy. The overview indicates that the level and nature of the welfare state change – including the actual policy design - differs extensively between EU Member States. Some countries rely rather heavily on child care services and seem to have lowered the fiscal disincentives, making labour force participation a feasible option also for young parents. Others countries rely heavily on parental leave, granting young parent (mothers) time to care before re-entering the labour market. Policies are also highly divers with regard to working time regime. On the basis of the actual part-time rate and an assessment of the part-time preferences, it seems that especially countries in north-west Europe score rather high in that respect; the incidence of part-time working hours is much lower in southern European Member States and in the new Member States.

Despite all differences, the current state of affairs also makes clear that the policy logic of most countries is not based on full individualization and/or complete gender equality in working life. The fiscal regime may still contain elements of ‘jointness’ and/or a non-working spouse allowances, childcare services may be in short supply and/or the actual demand limited by long term parental leave entitlements, and the labour market might still be organised on a full time basis, offering little labour market opportunities in periods of care. In short: the configuration of the welfare state is not completely geared towards the full adult worker model but rather seeks “the middle way between the old dependencies and the new independence” (Daly 2011: 2). This middle way may be explained by the fact that a transition takes time and that reforms have to phase in over a longer period of time. A perhaps more likely explanation is that there is little

commitment and/or perceived urgency and/or political support to opt for a full equalization of the role of men and women in paid and unpaid work. The result is – as Daly calls it - a *dual earner, gender specialized, family model*, which is geared towards greater, but not full equality.

This brings us to the final question: how to assess the logic and internal consistency of the different policy options. Do certain new models emerge or is there little evidence for cross national convergence?

4.2.4 Towards new models of gender equality?

The transition from the breadwinner to a more individualized adult model implies that the traditional links which “joined men to women, cash to care, income to carers have been fractured” (Pascall and Lewis 2004: 373). Instead new policies have emerged trying to facilitate the more equal roles of men and women. Several authors have tried to analyse the internal consistency of this transition and to map the changing welfare state configuration from a gender equality point of view (Gauthier 2002; Leitner 2003; Gornick and Meyers 2003; Plantenga and Remery 2005; 2009, Meulders and O’Dorchai 2007). A common finding of these analyses is that the actual welfare state findings are rather heterogeneous, do not comply with the standard welfare state typologies (e.g. inspired by the typology of Esping-Andersen), and that the trend does not indicate cross-national convergence. The studies vary, however, in scope, methodology and countries covered.

Leitner (2003), for example, focuses on ‘varieties of familialism’. Following up on Esping-Andersen notion of de-familialization, Leitner develops a gender-sensitive theoretical concept of familialism which allows to identify real world variations of familialism. Familialisation is in this respect described as “the extent to which the caring function of the family is promoted” (Leitner 2003: 354). Four ideal types of familialism are distinguished. *Explicit familialism* strengthens the family in caring for children, the handicapped and the elderly, without providing any alternative to family care. Within *optional familialism* services as well as home care policies are provided. Thus, the caring family is strengthened, but at the same time alternatives are offered to (partly) unburden the family from care responsibilities. *Implicit familialism* does not support the caring function of the family, but is not providing an alternative either. This type therefor relies implicitly upon the family. Finally *defamilialism* is characterized by strong de-familialization because of the state or market provision of care services and weak familialisation. The empirical analysis of 15 member states leads to country clusters that differ considerably from the well-known Esping-Andersen typology. A second important conclusion is that countries cluster different for differently care policies. According to Leitner (2003:372): “Both results call for a more differentiated approach in comparative welfare state research”.

Gauthier (2002) specifically addresses the issue of convergence. Given the common challenges of demographic change, reduced government budgets, globalisation and European integration, the question arises whether these common challenges translate into cross-national convergence of family policies. The analyses covers 22 OECD countries for the period of 1970-1999 and focuses on two major components of state support for families: the direct and indirect cash benefits for families and the support for working parents (especially leave entitlements). The analysis confirms that family policies have changed since 1970. There is an increase in the

state support for working parents, and a modest increase in the cash support for families. The analysis also indicates however, “that these trends had different levels of magnitude across countries and have consequently increased the divergence across countries. This is especially the case with regard to state support for working parents (Gauthier, 2002: 467). In short: there are common trends, but there is no cross national convergence.

In a more recent overview, covering 28 OECD countries, Thévenon (2011) examines cross-country difference in state support to families, focusing on leave entitlements, cash benefits, and the provision of services. Using a principle component analysis, he identifies five clusters of countries with broadly comparable family policy packages. The Nordic countries (‘substantial help to combine work and family for parents with children under age 3’); Anglo-Saxon countries (‘support for poor families, single parents and households with preschool children’). Southern Europe, Japan, Korea (‘even more limited assistance’); Eastern Europe (‘policies in transition’); Continent Europe (‘moving away from conservatism?’). He explains this variation by referring to different stages of development but also to the fact that family policies are rooted in particular historical and institutional circumstances, for example with regard to fertility, poverty and employment, which influences the actual design. The result is a broad geographical variation of state support to families, with some distinct clustering of countries but also considerable dispersion within each cluster.

Pascall and Lewis (2004) are less focused on an alternative mapping, but rather on assessing the emerging ‘gender regimes’, which they define as the ‘key policy logic of welfare states in relation to gender’ (2004:372), from a gender equality point of view. Essential is that gender regimes are ‘interconnected systems, through which paid work is connected to unpaid work, state services and benefits are delivered to individuals or households, costs are allocated, and time is shared between men and woman in households, as well as between households and employment’ (2004:380). In their view the current gender equality policies have been limited in effect, because they have addressed only part of the system; they mainly focus on women’s individual possibility for labour force participation on an equal footing with men. As a result, there is equal access to education, paid labour, equal wage legislation etc., but the fundamental problem is not addressed: “if gender equality policies are to be more effective in delivering equal treatment, in paid work and welfare, they need to address the interconnecting element of gender regimes as systems, with a logic of gender equality in care work, income, time and voice as well as in paid employment. This means developing an environment favouring more equal shares between men and women and paid work, care work, income, time and voice, between individuals within households and in paid work and politics”. (Pascall and Lewis 2004: 380). Their assessment of the current state of affairs is therefore rather negative: care work and unpaid care workers are the ‘casualties’ of the incomplete transition.

The gendered consequences may not only be felt at the level of the unpaid work and/or the carers. Several authors refer to what is called the ‘welfare state paradox’. In most research it is implicitly assumed that welfare states have uniform effects on the economic position of women. Yet, this might not be the case as welfare state policies are likely to interact with socio-economic position of women: especially the less educated women seem to benefit, but at the expense of career opportunities of highly educated women. Mandel and Semyonov (2006) have

examined this so-called welfare state paradox in more detail. Developed welfare states facilitate women's access into the labour market, but not into powerful and desirable options. More in particular, countries with an elaborate systems of welfare policies and a large public service sector tend to have high female participation rate, in combination with a low female representation in managerial jobs (see also Mandel and Shalev, 2009; and Hegewish and Gornick, 2011).

The results of Korpi et al. (2013) do not support this conclusion, however. Korpi et al (2013) argue that family policies are multi-dimensional and that the impact of different policies should be assessed on differently situated women and men, taking social-economic (class) differences into account. In the analysis a distinction is made between a traditional-family policy dimension and a dual-earner policy dimension, which can be either market-oriented or earner-carer oriented. The results indicate that earner-carer policies are rather positive in terms of female labour force participation. Earner-carer countries, which covers most of the Nordic European Member States, "employ significantly higher proportions of women with low and medium levels of formal education, without resulting in significant diminution in women's access to top wages and positions of power" (Korpi et al.,2013: 28).

Summarizing this small overview a broad consensus seems to have emerged that despite the common trends in EU Member states in terms of the rise of a more individualised adult worker model, there is a wide variety in the design of welfare state policies. Although some clusters of countries with broadly comparable family policies can be distinguished, it is also obvious that national policies are inspired by particular historical and institutional circumstances, with a highly divers policy landscape as result. There also seems to be a rather broad consensus on the fact that there is little emphasis on gender equality. In fact, gender equality is seldom at the heart of the actual welfare policies. In effect, the actual gender regime is rather the implicit (and perhaps accidental) result of diverse policies packages and therefore not much of a 'regime'. The puzzle becomes even more complex if welfare state features different policy logics, for example inspired by the freedom of choice argument.

In the end the differences may be related to different views on the status of the parent, more in particular the mother. The parent (mother) might either be seen as an employee who needs public support for her caring role. This implies that the policies are targeted towards making work pay, accessible child care services and flexible working hours. The parent (mother) might also be seen as a carer who needs public support in her breadwinner role. This implies a home-care tax allowances and leave entitlements. If the actual policy is inspired by parental choice considerations, the government is apparently not willing to make that choice, as a result of which both option are facilitated, with the likely result that the differences between parents (mothers) will increase.

4.2.5 Conclusions

In the Europe 2020 strategy the aim is to reach an overall employment rate of 75%. This policy goal implies a major shift in the thinking about paid and unpaid work, about men and women and the function of the welfare state. The design of the fiscal system used to be inspired by the breadwinner family model, creating huge disincentives for entering the labour market by

secondary earners; the emphasis is now on a more individualized scheme, making work pay both for men and women, fathers and mothers. The changing division of work also implies a change in family policy. Within the breadwinner model the policy is on facilitating the specialization between the male breadwinner and the female care taker. Child benefits and/or home care allowances seem the relevant options here. In contrast, within the adult worker model paid and unpaid work are supposed to be combined in a single person. The focus of the welfare state is therefore no longer on specialization, but rather on reconciling different roles and options, by creating a care infrastructure. A more individualized employment model also puts pressure on the organization of work and working time. The breadwinner was based on the 40hours working week; the adult worker model might benefit from more working time flexibility, thereby increasing the labor market options.

Although these policy changes are clearly recognizable, this paper also illustrates the large gap between the implicit assumptions of the adult worker model and the actual reality of most European Member States. Only a few countries, with the Nordic countries as the most well-known examples, have developed a system of child care arrangements that seems to be based on the assumption that fathers and mothers will both be fully engaged in the labour market. Others countries have invested in policies which allow for large interruption in labour force participation or which allow the combination of work and care by introducing part-time working hours. Overall the actual policy design does not indicate a high profile of gender equality.

More in particular the specific welfare state configuration seems to imply a certain reluctance to give up the support of family life. This confirms the conclusions of Daly (2011) with regard to her recent assessment of the claim that European welfare states are in the process of creating an adult worker model. According to Daly there is indeed a strong move towards an individualisation of social policy, promoting a worker role for women, yet this move is tempered through several developments, like the promotion of part-time working hours, the support of family care and the absence of attention for gender equality. The result is a policy that at once familializes and individualizes. Daly (2011: 17): "While enabling people to be out of employment might seem at odds with the activation and self-sufficiency orientation of policy reform, the fact that both are concurrent emphases of policy betokens complexity".

Perhaps the most challenging problem of the current redesign of the welfare state is that family support policies can only to a certain extent been redesigned in accordance with employment policies. Whereas fiscal policy and social security policy clearly become more targeted towards increasing the employment rate, care policies are also motivated by different issues, like fertility rate, family values and child well-being. Although policies in these areas may not by definition contradict labour market considerations, it seems likely that some trade-offs exists between facilitating care and stimulating labour supply. In short: policy objectives on participation, gender equality, fertility and family life are not easily compatible. Child development concerns, for example, may translate into a policy targeted at expanding high-quality childcare services, but just as easily translate into a policy favouring extended leave facilities and/or increasing the provision of childcare allowances. Long parental leave facilities, however, or a generous financial incentive structure may not promote female labour supply and may result in large differences in male and female working time patterns. Another complicated matter refers to the

issue of parental choice. Parents may differ in their preferences with regard to work and family outcomes and most public policies tend to enhance parental choice. The result may be a complicated mixture of time facilities, financial allowances and services that may not necessarily be very coherent and which may not increase the equality between men and women nor among women.

This also means that the search for welfare, work and gender equality has not yet ended. The basic question remains: how to reconcile the interest of the individual, the market and the state in a way that is both efficient and fair from a social, demographic, economic and gender perspective. The adult worker model makes a strong claim towards an equal role of men and women into the economic process. The current state of affairs within the EU Member States indicates that this model is difficult to realise. Although some women participate on an equal footing with men, the 'dual earner, gender specialized, family model', which is geared towards greater, but not full equality, seems more feasible.

4.3 Subjective well-being and socio-ecological transition²⁰

Gunther Tichy (WIFO)

The WWWforEurope project intends to lay the analytical foundation for a new development strategy that enables a dynamic socio-ecological transition to high levels of employment, social inclusion, gender equity and environmental sustainability. This task arises from the wide gap between the broad formal acceptance of these goals and their troublesome realisation. Citizens are not prepared to change their behaviour, powerful policy instruments are missing, serious trade-off problems exist, and strong externalities drive a wedge between social and private goals. To solve these problems potential differences between the urgency and hierarchy of a society's goals on the one hand and individuals' goals on the other must be known. This is indeed a near-blind spot in mainstream economics. Utility functions are almost unavoidably based on rational behaviour and purely economic goals, while the widely chosen alternative, revealed preferences, necessarily has to assume that individuals come to their decisions 'rationally' and are aware of longer-term consequences. Beyond-GDP indicators are typically top-down approaches, collecting what citizens' should consider when forming their goals. The rather new field of Subjective-Well-Being (SWB) research can help to deal with these problems. One must be cautious in applying it, however, as SWB research has become (too) popular in the last decade, proving an explosive topic in the media. Marketing-oriented terminology does not differentiate between subjective well-being and happiness ("Lebenszufriedenheit" versus "Glück" in German). The quest for happiness has created a specific market (Flora, 2009) and "[i]ncreasing public happiness has become an overt goal of public policy in many countries, sitting, sometimes uneasily alongside more familiar goals such as economic growth, national

²⁰ Thanks are due to K. Aiginger and M. Schratzenstaller for inspiring discussion and helpful comments on an earlier draft and to the referee K. Bayer.

security, and social justice.” (Mulgan, 2013: 517). In the striving for popularity, the term “happiness” has lost precision²¹ and, consequently some of its relevance to policy.

4.3.1 Definitions and data

In contrast to psychologists and sociologists, who accurately differentiate between SWB,²² happiness and life satisfaction, economists frequently interchange these terms and, sadly, often do this in a deliberately marketing-oriented way. The following quotation from the World Happiness Report provides a good example, as it contains the correct definitions but nevertheless uses the term ‘happiness’ incorrectly:

“Subjective well-being’ is the general expression used to cover a range of individual self-reports of moods and life assessments. The word ‘happiness’ is often used in an equally general way, as in the title of this report. It does help to focus thinking, and *attracts attention* (my emphasis G.T.) more quickly than does ‘subjective well-being’. But there is a risk of confusion. A bit of advance explanation may help to keep things clear.

Among various measures of subjective well-being, the primary distinction to be made is between cognitive life evaluations (represented by questions asking how happy or satisfied people are with their lives as a whole), and emotional reports. Early modern attempts to classify different types of subjective well-being in psychology have also made a distinction between two types of emotional reports: positive affect (a range of positive emotions) and negative affect (a range of negative emotions). The primary distinction between life evaluations and emotional reports continues to be accepted today. It is also accepted, although less generally, that positive and negative affect carry different information, and need to be separately measured and analyzed. In this report we shall present all three types of measure.

How does happiness come into this classification? For better or worse, it enters in three ways. It is sometimes used as a current emotional report – ‘How happy are you now?’, sometimes as a remembered emotion, as in ‘How happy were you yesterday?’, and very often as a form of life evaluation, as in ‘How happy are you with your life as a whole these days?’ People answer these three types of happiness question differently, so it is important to keep track of what is being asked. The good news is that the answers differ in ways that suggest that people understand what they are being asked, and answer appropriately. Thus when people are asked about their *happiness now or yesterday, the answers are closely correlated with current activities and events in their lives today or yesterday. By contrast, when people are asked how happy they are with their lives a whole these days, their answers match very closely the answers to other similar evaluations of life as a whole.*” (Helliwell and Wang, n.d.: 11; my italics G.T.).

²¹ “Thus what the media (and often SWB researchers themselves) have referred to as ‘happiness’ rankings may be a misnomer. The term happiness (in contrast to life satisfaction) connotes an experience that is emotional and momentary.” (Tov and Au, 2013: 453).

²² Kahneman and Deaton (2010) found “that emotional well-being (measured by questions about emotional experiences yesterday) and life evaluation (measured by Cantril’s Self-Anchoring Scale) have different correlates. Income and education are more closely related to life evaluation, but health, care giving, loneliness, and smoking are relatively stronger predictors of daily emotions.” See also section 4.3.3.

In addition to cognitive (life satisfaction) and affective (happiness, anger, worry) elements of SWB, which focus on a person's experiences, the psychological literature further distinguishes a state of *eudaimonia* or good psychological functioning (Clark and Senik, 2011). This paper follows the psychology nomenclature and restricts the term "happiness" to the emotional aspects ("How happy are you now?" or "How happy were you yesterday?"), while for the cognitive aspects ("How happy are you with your life as a whole these days?") the term "life satisfaction" is used. "Subjective Well-Being" (SWB) comprises both (and *eudaimonia* additionally). For the problems of trade-offs between goals and externalities, which drive a wedge between social and private goals, the cognitive aspects – life satisfaction – are relevant. These will form the core of this paper. This stands in accordance with the substance (as opposed to terminology) of the economic literature,²³ while sociologists and psychologists concentrate on the emotional aspects, namely happiness (Glück) and to some extent *eudaimonia*. Section 4.3.3 will nevertheless provide a brief outline of the differing determinants of life satisfaction and happiness.

The studies dealing with SWB are based on a *large number of surveys*: The World Databank of Happiness comprises 4027 entries, of which two thirds (Europe 70%, USA 54%) refer to global cognitive measures, representing the more reflective of enduring social conditions. The surveys most heavily used by economists are

- World Values Survey (WVS): 5 waves since 1981, the number of countries (from all continents) rising from 42 to 62, with a very broad program of about 250 questions;
- General Social Survey (GSS): Yearly since 1972 (1979, 1981 and 1992 missing), about 3000 US-American adults, applying a 3-point Likert scale²⁴ for the SWB question;
- European Social Survey (ESS): 6 rounds since 2001, comprising EU15 countries, applying a 11-point Likert scale for the SWB question;
- The Eurobarometer (EB), semi-annually since 1973, comprising all EU-countries, ~1000 telephone interviews/country, applying a 4-point Likert scale for the SWB question;
- Gallup World Poll: Annually since 1977/2005, comprising 54/150 countries (distributed around the world), applying a 11-step Cantril ladder²⁵ for the SWB question;
- German Socio-Economic Panel (GSOEP), tracking the same individuals each year since 1984, surveying about 20,000 persons from about 11,000 households.

²³ Economists factually deal almost exclusively with life satisfaction but, as mentioned before, predominately call it happiness: See e.g. "World *Happiness Report*" (Helliwell et al., n.d.), "*Happiness Lessons*" (Layard, 2005), "*Happiness, growth, and the life cycle*" (Easterlin, 2010).

²⁴ When responding to a Likert questionnaire item, respondents specify their level of agreement or disagreement on a symmetric agree-disagree scale for a series of statements. Thus, the range captures the intensity of their feelings for a given item. Likert scaling assumes that distances on each item are equal.

²⁵ The Cantril ladder (self-anchoring scale) is a particular approach to measuring life evaluation that asks respondents to imagine a ladder with rungs from 0 to 10, where 10 is the best possible life for them. Respondents are asked to indicate where on the ladder they would place their own life.

Table 7 **Number of data points in the World Database of Happiness**

	Cognitive	Affective
Global	Life satisfaction 1 Life evaluation 1 2678 Overall quality of life 1	Overall happiness 1 General depression 1 885
Time inclusive	-- Satisfaction with previous day 179	Past month depression 1 Frequency of happiness in past week 1 285 Previous day emotions 1

Source: Toy and Au (2013: 452), modified

The relevant questions concerning life satisfaction are similar in the different surveys. The European Social Survey uses two questions: “Taking all things together, how happy would you say you are?” and “All things considered, how satisfied are you with your life as a whole nowadays?”, while the World Values Survey asks almost the same question, except that it uses “these days” instead of “nowadays”, and Eurobarometer asks: “On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?” The three separate Cantril ladder questions in the Gallup World Poll ask respondents to evaluate their lives “at the present time”, five years ago and five years in the future on a ten-point ladder. According to the similarity of the questions, research has been able to discover very similar stories about the likely sources of a good life.²⁶

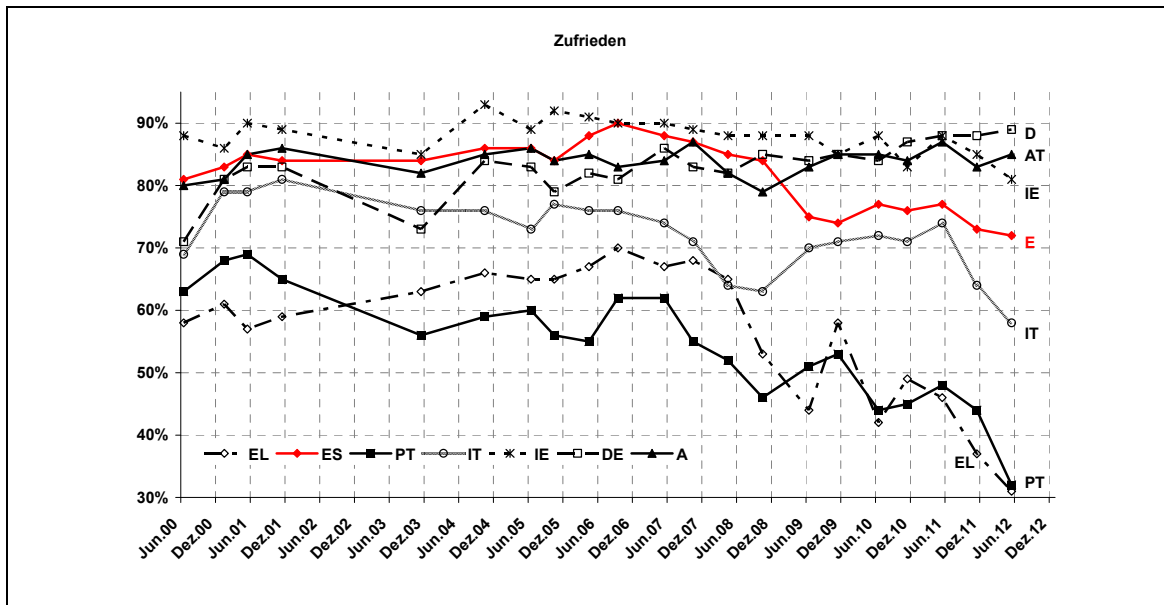
The following section will use the determinants of self-reported life satisfaction to work out the preferences of individuals and compare them with the necessities of the envisaged socio-ecological transition. Beforehand, three caveats need to be voiced: general objections to self-evaluation, the problem of bias due to cultural differences, and the limited qualification of life satisfaction (and likewise of happiness) as a yardstick of peoples’ assessments and decisions.

Some critics do not trust the *reliability of self-evaluations* and maintain that they are not correlated with actual behaviour (e.g. Glaeser et al., 2000). The bulk of evidence contradicts this, however. Psychological studies confirm that persons who characterize themselves as satisfied laugh more frequently (Fernandéz-Dols and Ruiz-Belda, 1990), are less suicide-endangered (Oswald, 1997: 1823ff; Koivumaa et al., 2001), and are considered satisfied by relatives and friends (Sandvik et al., 1993). Their satisfaction is also reflected in a variety of objective measures, including facial expressions, brain-wave patterns, cortisol measures and pulse at the individual level (Shedler et al., 1993). People generally give similar answers when asked the same question at different points in time, and test-retest results for subjective well-being measures yield correlations of between 0.6 and 0.7 for self-reports done on the same day (Krueger and Schkade 2007). Reversing the direction of research, Freeman (1998) and Clark et

²⁶ “But when happiness is seen as an emotional report, and measured at a point in time, then it looks very like other measures of positive affect. Thus ‘happiness yesterday’ measured on a 0 to 10 scale as a positive affect measure has very different properties from life satisfaction, asked on the same scale of the same respondents.” (Helliwell and Wang, n.d.:15).

al. (2008b: 119ff), demonstrate that one can use the level of life satisfaction of respondents to assess their behaviour with respect to productivity, unemployment, conjugal behaviour, mortality, etc. Bjørnskov (2010) demonstrated that Gallup's Cantril-ladder measure of life satisfaction correlates highly (0.75) with WWS's Likert scale. Economic studies have succeeded in explaining the individual and social determinants of satisfaction consistently over countries and time (Di Tella et al., 2003: 812; Blanchflower and Oswald, 2011), with Figure 21 showing that satisfaction reflects the wealth gap as well as the Northwest-Southeast gap. Furthermore, it reveals that satisfaction has responded to the financial crisis in a sensitive and differentiated way (Tichy, 2013).

Figure 21 **Life satisfaction in countries differently affected by the financial crisis**



Source: Tichy (2013)

It is the distinctive feature of subjective well-being measures that they offer people the chance to report on the quality of their own lives, reflecting their own histories, personalities and preferences. These are arguably the most democratic of well-being measures, since they do not reflect what experts or governments think should define a good life, but instead represent a direct personal judgment. In this light, the subjectivity of happiness is a strength rather than a weakness.²⁷ The availability of the respondents' personal characteristics and the size of the samples enables an extraction of the very aspects that cause the respondents' happiness. This makes it possible to surpass direct answers (opinion polls) or utility functions as a guide to economic policy: SWB research does not report what people believe makes them happy, but rather carves out the conditions that lay the foundation for their happiness.

²⁷ "The most fundamental indicator of your happiness is how happy YOU feel, not whether others see you smiling, your family thinks you are happy, or you have all the presumed material advantages of a good life." (Helliwell and Wang, n.d.: 21; original emphasis). Above, it has been shown that these elements are nevertheless highly correlated.

The conditions that lay the foundation for happiness can provide an important guide for policy but this will not work without some further deliberations. Section 4.3.3 will distinguish three different layers of contributing factors to social well-being with different grades of consistency and sustainability. The conventional analyses, furthermore, concentrate in most cases on the average relevance of the determinants of life satisfaction; the dispersion among the social groups and the relevance of diverging bundles of targets for minority groups is neglected in most of the studies.

The second caveat refers to the potential bias of *cultural differences*. Subjective well-being, like income, is unequally distributed within and among nations, and the question is whether this reflects actual differences. Danes, for instance, always report the by far highest life satisfaction in Eurobarometer surveys,²⁸ and some evidence exists that cultural norms encourage US-Americans to present their lives in a more positive light (Kahneman and Riis, 2005).²⁹ Reported SWB tends to be higher in individualistic cultures than in collectivist ones, in which more emphasis is placed on personal modesty, self-criticism and social harmony (Suh, 2000). “The metaphor people adopt, and the myth they perpetuate shape emotional life and happiness levels” (Vittersø, 2013: 14). One can, however, easily overemphasise the cultural differences. The Gallup-World Poll’s Cantril ladder, for example, shows that the variation of subjective well-being across the world’s population largely takes place *within* countries (Helliwell and Wang, n.d., 12). Blanchflower and Oswald (2008), furthermore, find a strong correlation between psychological well-being and blood pressure among countries, and consider this as a confirmation of the reliability of country comparisons. Finally, cultural differences, if they exist at all, are irrelevant in explaining the constituents of happiness within one country or in analysing time series.

The third caveat hints at the *narrow definition of life satisfaction* (and even more of happiness) in this paper (as well in all of the respective economic literature). Philosophy employs much broader definitions which, furthermore, constantly change over time (see Section III of David et al., 2013). For Aristippus in Greek antiquity, happiness was the sum of momentary pleasures, and both Bentham at the turn of the 18th to the 19th century and today’s Kahneman (1999) have endorsed this interpretation. Defining happiness as the pleasures with life as a whole, Epicurus was not far from this conception (Kahneman et al., 2010), but in Stoicism happiness was not considered an end in itself, as the Stoic philosophy preached detachment from emotional life. Kierkegaard, Nietzsche or Heidegger perceived happiness as an obstacle to the deeper goal of wisdom, and for Aristotle good life followed from the exercise of virtuous acts. The Enlightenment saw happiness as the right of all human beings, which is reflected in the US constitution’s pursuit of happiness as an inalienable right. Happiness may be pleasure, virtue, fulfilment of human nature, and, similarly to health, may be more than the mere absence of

²⁸ “The happiness of Danes may be better characterised by contentment rather than over-flowing ebullience.” (Safer, 2008).

²⁹ “... the USA appears to have significantly higher levels of life satisfaction than France, yet more detailed analysis of happiness levels day by day shows Americans doing worse than the French, pointing to the power of cultural norms ...” (Mulgan, 2013: 519).

unhappiness. All this should be kept in mind, but it is not the subject of this paper, whose task it is to extricate the facts which determine self-reported life satisfaction, and to confront these with the requirements and policy implications of a socio-ecological transition path to sustainable development.

Even if it is important to keep in mind this paper's (and the economic SWB literature's in general) restricted conception of life satisfaction, it appears fully appropriate for the problems at hand in our individualistic and materialistic epoch indeed. "[T]he type of widespread popular interest in happiness ... is particularly characteristic of a consumer culture (Ahuvia and Izberk-Bilgin, 2013: 485), and "... the new heroes of consumer culture make lifestyle a life project and display their individuality and the sense of style in the particularity of the assemblage of goods, clothes, practices, experiences, appearance and bodily dispositions they design together into a lifestyle." (Ahuvia and Izberk-Bilgin, 2013: 484)

4.3.2 Determinants of life satisfaction

It is important to bear in mind that the surveys themselves do not ask for the determinants of life satisfaction, they only ask if the respondent is more or less satisfied with the life he leads. It is left to SWB research to discover these determinants by comparing the individuals' degree of life satisfaction with the characteristics of the respondent (marital status, religion, income, etc.) and his economic and social environment. The estimation is restricted to orders of magnitude, however, for three reasons. First, only dichotomous variables, such as divorce or employment, can be defined clearly, while qualitative but equally important ones, such as health, distribution, trust or participation, are less easy to isolate. Second, many determinants are correlated, so that coefficients and causalities may be less reliable. And finally, the only (known) way to compare the importance of determinants is a transformation into income equivalents, which is a hazy task to begin with, but all the more so when income belongs to the less important determinants of life satisfaction.

For a clearer presentation the following sections will distinguish individual, economic and social determinants of life satisfaction. This distinction is to some extent arbitrary and not exclusive. Income, for example, has elements of all three categories. Furthermore, the various determinants frequently influence each other, with income, for example, positively correlating with health. The separation of the three categories, however, points to the fact that the economic rather than individual determinants provide the main starting point for policy, and the social ones indicate the elements of altruism determining life satisfaction.

4.3.2.1 Individual determinants of life satisfaction

Most of the studies concur that health and marital status are among the most important determinants of life satisfaction. Blanchflower and Oswald (2004: 12) found for the U.S. and Great Britain that an existing (first) *marriage* contributes two thirds more to life satisfaction than being employed. On an OECD-wide basis and roughly a decade later (data for 2009 and 2010), Boarini et al. (2012: 21) identified marriage as contributing only half as much as employment, but still the 1.7-fold of a doubling of income. The quality of the marriage, however, as well as that of social relations, is more important than the marriage itself or the sheer number of

relations (Demir, 2013: 817-18). Divorce reduces life satisfaction by 40% (Gardner and Oswald, 2005), while becoming a widower reduces it somewhat less and separation without divorce somewhat more. In all these cases, the general adaptation effect applies: about one half of the original effect is restored within two years.

The satisfaction-heightening effect of *health* is assessed even more strongly by most respondents (Oswald, 1997, 1827; Clark and Oswald, 2002; Helliwell, 2002). This information is less reliable and less suited to quantification, however, for two main reasons: The responses appear to be identical to those about life satisfaction in general³⁰ and self-assessed health is weakly correlated with actual (measured) health (Diener et al., 1999; Deaton, 2008: 66). Furthermore, there is good evidence that some of the association between good health and high life satisfaction is due to high life satisfaction causing good health (Diener and Chan, 2011). Serious illness or being disabled reduces life satisfaction, but again a part this loss wears off (Donovan and Halpern, 2002: 24). Disabled people are less satisfied with their lives by ½ percentage points (severely disabled by 1 percentage point) on a seven-point scale according to Oswald and Powdthavee (2005).

A less frequently considered determinant of life satisfaction is *relational goods*, “the affective/expressive, non instrumental, side of interpersonal relationships”. The Relational Time Index, comprising the elements “attend social gatherings”, “attend cultural events”, “participate in sports”, “perform volunteer work” and “attend church or religious events” is significantly correlated with satisfaction (Becchetti et al., 2008). “The strongest unique predictors of current happiness were Mental Control (inversely related), Direct Attempts, Affiliation, Religion, Partying, and Active Leisure. Gender differences suggest that men prefer to engage in Active Leisure and Mental Control, whereas women favour Affiliation, Goal Pursuit, Passive Leisure, and Religion. Relative to Asian and Chicano(a) students, White students preferred using high arousal strategies.” (Tkach and Lyubomirsky, 2006: 183).

Religion, such as belief in god and regular attendance of church, influences satisfaction positively (Diener et al., 1999; Helliwell, 2002: 13), especially in bad times. Persons *trusting each other* are in general more satisfied (Helliwell, 2002: 13), as are introverted people more than extroverted people (Kasser and Ryan, 2001).

With respect to *age*, Blanchflower and Oswald (2004: 9) found a U-shaped relation. The trough lies between 45 and 55 years (Donovan and Halpern, 2002: 14) and between 35 to 45 years in the international investigation by Helliwell (2002: 12), both of these studies reflecting the well-known midlife crisis.

The influence of *education* on life satisfaction appears contested: Boarini et al. (2012) found a significant positive effect, especially for tertiary education for 34 OECD countries. Blanchflower and Oswald (2004: 11) detected a small positive effect in their earlier study for the USA and Britain; Diener et al. (1999), Helliwell (2002: 11) as well as Kahneman and Deaton (2010) found no effect exceeding the difference in income. Education, nevertheless, may have some non-income benefits for individuals who get an education, especially in poor countries. However, this

³⁰ A 1% better assessment of own health is connected with a 1% increase in life satisfaction (Helliwell, 2002: 9).

appears smaller than is often claimed by educationalists, reflecting the well-known gap between individual and social returns. On top of this, important social effects may work through an informed electorate and in poor countries through reduced birth rates, better health and reduced mortality (Layard et al., n.d.: 78).

Contrary to the contested influence of education on life satisfaction, numerous results of research point towards substantial positive effects of *self-determination*, as in personal freedom, employee participation, participation in society and an adequate degree of leisure. Veenhofen (2000) demonstrated the positive influence of *personal freedom* on life satisfaction for a broad sample of countries, and Inglehart and Klingemann (2000: 171f) described this dependence as S-shaped. For the descendents of former Russia, the increase in personal freedom did not contribute much to life satisfaction, while it was considerably higher in the less suppressed Eastern European countries³¹ and Latin America. In Western democracies, the effect of a further increase in personal freedom on life satisfaction is again small.

A second component of self-determination that increases life satisfaction is *participation*. Blinder (1990), Kruse und Blasi (1995) as well as OECD (1995) emphasise the positive influence of *employee participation* on life satisfaction.³² Frey and Stutzer (2000) point towards the satisfaction-increasing effects of *political participation*, with Swiss direct democracy as an example. The importance of *participation in society* has been worked out for the U.S. by Putnam (2001), for Great Britain by Donovan and Halpern (2002: 26), and by Helliwell (2002: 13) for a large number of quite different states, with membership in clubs, tax compliance and trust showing a markedly positive contribution to life satisfaction. Putnam (2001) and Bjørnskov (2003) emphasise the general contribution of *Social Capital* to life satisfaction.

Leisure contributes to satisfaction, even in the U.S. (Donovan and Halpern, 2002: 25f). This is astonishing, as US-Americans work considerably longer hours than Europeans, naming this as an explanation for their superior economic performance and explaining it as a deliberate reaction to lower taxation (Prescott, 2004). Life satisfaction research, however, suggests that US-Americans' long working hours are not deliberately chosen. In 1955, 49% indicated that they would prefer to have more leisure, and in 1991 this share had risen to 68% (Donovan and Halpern, 2002: 25). Alesina et al. (2001b) and Alesina et al. (2005) demonstrated that it is beyond the power of the individual employee to reduce his working time; only collective action by labour unions can achieve this. No corresponding studies evidently exist for Europe, but Englishmen working in the garden or going in for sport once a week – both indicating more leisure – report a higher amount of life satisfaction (75% satisfied versus 70%), as found by Donovan and Halpern (2002: 25f).

Social connections and human contact contribute strongly to life satisfaction. Living in a stable relationship has an effect on life satisfaction roughly half as large as a doubling of income

³¹ The difference between Byelorussia and Hungary is equal to the effect of a well-functioning marriage (Helliwell, 2002: 20).

³² According to Freeman (1998: 9) even firms with employee participation, profit sharing or employee ownership profit from the increased life satisfaction of their employees, as they "seem to do a bit better than other firms."

(Helliwell, 2008). Other measures of social support and trust in others are also positively associated with life satisfaction (Helliwell and Wang, 2011).

Last but not least, *gender aspects* appear to have some influence on life satisfaction. Women are more satisfied with their lives than men in Great Britain and the USA, but not in Switzerland (Frey and Stutzer, 2000: 925). Similarly to the USA and Great Britain, Boarini et al. (2012) found that being female was associated with higher levels of life satisfaction in 34 OECD countries, but with lower levels of affect balance. "Given the consistency in terms of the sign on other coefficients, this raises questions about the different gender responses to alternative measures of subjective well-being. One possibility is that women are more willing to report more extreme responses than men, which would be consistent with a higher average score on life satisfaction (with more women scoring highly overall due to the general rightward skew of the life satisfaction data distribution), but a lower affect balance (with women reporting both more positive and more negative emotions)." (Boarini et al., 2012: 22) Contrary to expectations, women's life satisfaction declined in the U.S., (Blanchflower and Oswald, 2004: 6). As a rather curious addition, even *images of beauty* appear to be relevant for life satisfaction, with images of ideal beauty bolstering young women's satisfaction and images of body size boosting that of men (Argyle, 1987).

4.3.2.2 Economic determinants of life satisfaction

Unemployment influences life satisfaction (negatively) more than any other economic determinant. 40% of Europe's unemployed are not at all satisfied (compared to 19% of the total population),³³ and only 15% (compared to 26%) are very satisfied (Alesina et al., 2001a: table 2.2). The average American unemployed person attains only 54% of the total population's satisfaction (Di Tella et al., 2003: 811). Boarini et al. (2012) estimate that unemployment decreases life satisfaction three times more strongly than a doubling of (the log of) household income. Life satisfaction studies distinguish carefully between the effects of unemployment *per se* on life satisfaction and the resulting loss of income: for example, to what extent is an unemployed person less satisfied than an employed person with the same personal characteristics (sex, age, status, etc.) and the same income? The isolated pure unemployment effect, the psychological and social sequel, corresponds to a plunge from the top income quartile to the lowest one (Di Tella et al., 2003: 812), or to a loss of \$ 60,000/year (Blanchflower and Oswald, 2004: 13). The bulk of evidence shows that even low quality jobs are associated with higher life satisfaction than unemployment, and this effect is statistically significant for most specifications of 'bad' jobs. Even concerns about potential job loss considerably reduce life satisfaction (Uhde, 2010: 425). A study examining the German workfare program (Wulfgramm, 2011) concludes that people's life satisfaction rises substantially when they go from being completely out of work to joining the program (Layard et al., n.d.: 67). The loss of income resulting from the loss of a job, whose size depends on the replacement ratio, must be added to the psychological loss of satisfaction, but this effect is considerably smaller.

³³ As compared with the lowest income quartile in which only 28% are very unsatisfied.

Men of working age suffer most from the psychological impact of unemployment (Blanchflower and Oswald, 2004: 13), and women over 50 the least (Gerlach and Stephan, 1996: 326). The psychological impact of unemployment levels off gradually due to the ‘adaptation effect’ (Clark and Oswald, 1994), but the previous level of satisfaction is never attained, even in subsequent employment (Lucas et al., 2004). A ‘relativity effect’ reduces the psychological consequences when marriage partner or friends are also unemployed, when the local unemployment rate is high, or when the unemployed person can rate his unemployment as ‘normal’ or ‘undeserved’ (Clark, 2001). As section 4.3.2.3 will show, a high unemployment rate not only reduces the life satisfaction of the unemployed, but also that of employed persons (Clark et al., 2008a).

The effect of *income* on life satisfaction is complex. Persons with higher income are more satisfied, which seems to support the American saying: “Those who say that money can’t buy happiness don’t know where to shop”. 87% of respondents in the top income quartile consider themselves highly or fairly satisfied, compared to only 73% in the lowest quartile (Di Tella et al., 2003: 811). In Boarini’s et al. (2012) study of the 34 OECD countries, (log) household income is highly significant, with a doubling of income associated with an increase of nearly 0.2 points in life satisfaction on a 10-rung Cantril ladder. This is somewhat smaller than the coefficient found by Stevenson and Wolfers (2008), but this may be partly accounted for by the inclusion of variables referring to “Not having enough money to buy food”, unemployment and education. The marginal utility of additional income, however, decreases rapidly according to most studies and stops at an income level of about (then) € 10,000 (Donovan and Halpern, 2002: 10; Layard, 2003, lecture 1; Frey and Stutzer, 2002: 423).³⁴ For a rich person, an additional euro of wealth brings only one tenth of the life satisfaction it would give to a poor person (with one tenth of the rich’s income; see Layard et al., 2008). “Whilst money might buy a little happiness, it does not buy very much” (Dixon, 1997: 1813).

This is the first explanation of the so-called Easterlin paradox (Easterlin, 1974), which rests on the contrasting evidence that the rich are more satisfied, but that an increase in income does not increase overall satisfaction. A second, fairly obvious explanation results directly from the way in which life satisfaction is measured. More than “very satisfied” (the highest point on the Likert scale or the Cantril ladder) is impossible to attain, suggesting that the share of satisfied respondents cannot surpass 100%. Thus, even if recent proponents of the hypothesis that rising income does in fact generally raise life satisfaction (Deaton, 2008; Stevenson and Wolfers, 2008; Sacks et al., 2010; Kahneman and Deaton, 2010) are correct,³⁵ neither the Likert scale nor the Cantril ladder can indicate it. The third argument explaining the Easterlin paradox rests on the adaptation effect, which describes the mere temporary satisfaction new goods and services offer and the adaptation of aspirations. Di Tella et al. (2007) emphasise, for example, that the satisfaction resulting from a rise in income evaporates within five years. The observation that the rich are nevertheless more satisfied with their lives, as the fourth argument

³⁴ For the explanation of the differences in life satisfaction within EU, therefore, even the low ones of Portugal and Greece (see figure 1), income differences are barely relevant.

³⁵ Anecdotal evidence suggests that it is not income *per se* to which the rich aspire, but certain positional goods or a specific lifestyle.

says, results from the financial security they enjoy. Income uncertainty definitely reduces life satisfaction (Uhde, 2010: 425), while income security definitely boosts it (Freiberger Stiftung, 2010: 19; Noll und Weick, 2010).

The last and probably most important explanation of the Easterlin paradox is the ‘relativity effect’: the consequences of rich people’s consumption for the average consumer, and the different effects of individual and national increases in income. The literature unanimously confirms that the effects of *relative* income on life satisfaction by far dominate those of absolute income.³⁶ *Poverty* (“Not having enough money to buy food”) strongly reduces life satisfaction (Boarini et al., 2012). Next to employment, *income distribution*, is therefore one of the dominant economic determinants of life satisfaction. Unequal income distribution reduces life satisfaction in the U.S. and even more significantly in Europe (Alesina et al., 2001a): An increase in the Gini-coefficient of 10 percentage points – matching a transition from the Austrian to the Italian income distribution or from the Danish to the British – implies a reduction of the share of “very satisfied” from 26½% to 21% and an increase of the unsatisfied from 19½% to 25%. One strange finding is that in the U.S. an unequal distribution primarily reduces the satisfaction of the rich. Given the heavy unequal distribution in this country, this might reflect the fear of more violence and less personal safety, but it might also point toward a guilty conscience amongst the rich, which translates into private – not policy-induced – charitable action.³⁷ Given the importance of the income distribution, it is evident that social security increases the life satisfaction of the recipients of transfers (Uhde, 2010). Transfers and a more equal income distribution even increase the life satisfaction of a society in general; the net effect, however, is reduced by the negative side of the relative-income effect, the loss of satisfaction of those with higher incomes.

The influence of absolute income on life satisfaction still remains an important topic for further research, however. Previous unanimity with respect to a limited importance of income level has been increasingly questioned (Deaton, 2008; Stevenson and Wolfers, 2008; Sacks et al., 2010; Kahneman and Deaton, 2010). Furthermore, Inglehart and Rabier (1986), found a significant positive contribution of the increase of income in the preceding 12 months for Western Europe (1973-83), and Clark et al. (2008a: 127) refers to the fact that life-income profiles with current modest increases are preferable to those with constant income, a growth boosting perception that is most relevant for the WWWforEurope project.

The conclusion that relative income is more important than absolute income nevertheless holds but raises the question as to what is relative. The European Social Survey (ESS) asked people “Whose income would you be most likely to compare your own with?” Instead of ‘the rich’, and

³⁶ 90% of the U.S. population prefer a more equal distribution of wealth than today’s historic high inequality (Norton and Ariely, 2011).

³⁷ The fact is surprising, nevertheless, as 71% of Americans compared to only 40% of EU-Europeans believe that the poor would be richer if they applied themselves more (Alesina and Angeletos, 2003: 2), and 60% Europeans compared to only 29% of Americans believe that it is not possible to leave a poverty trap through own effort (Alesina et al., 2001b). “Interestingly, the actual facts are actually the other way round: there is more intergenerational social mobility in Europe than the U.S. And there is more mobility where there is greater income equality. But attitudes have an effect on perceptions and thus on happiness.” (Layard et al., n.d.: 71)

somewhat surprisingly with respect to widely held preoccupations, ‘colleagues’ was the group mentioned most often (Layard et al., n.d.: 62). Layard (2005) similarly found that colleagues, friends and neighbours were the most frequently named reference group, and Runciman (1966) argued that people tend to compare themselves most with their nearest equals. Comparison is indeed an important element of life satisfaction, however too much comparison with others reduces satisfaction: ESS asked “How important is it for you to compare your income with other people’s incomes?” Those answering that income comparisons were more important for them were on average less satisfied with their lives – again a fact highly relevant for the WWWforEurope project. According to Layard et al. (n.d.: 62), similar results have been found for the U.S.

The regression studies based on the surveys are unavoidably restricted in comparing the satisfaction of individuals at the same point of time; they cannot track the satisfaction of *specific* individuals over time. The West German Socio-Economic Panel (GSOEP), however, has been tracking the same individuals over time on an annual basis since 1984. Using the Eurobarometer series since 1972 and the GSOEP since 1984, Layard et al. (n.d.: 61-62) found that differences in income explain about 1% of the variance of life-satisfaction in the population; no effect is left in this study for absolute income, only relative income matters. To this extent the study explains why average life satisfaction has not risen despite the growth of GDP, but one should add that income distribution deteriorated markedly as well in this period.

One further argument contributing to the discussion on the influence of absolute income posits that it is not income *per se* which people desire but their *position in society*, which is governed by the rank in the income hierarchy and/or by commanding specific goods and services which are inevitably in limited supply – position goods (Hirsch, 1977). The tragedy of the position goods and their contribution to life satisfaction, as well as to the income-growth race, is that everybody works hard to catch them, but the goal is attainable for a few only, not to society as a whole. Whenever a lower income group has come to a position enabling them to obtain these goods, they lose their character of position goods and other goods, not available to them, take on this position. And so the race continues indefinitely as one of the main contributors to the growth race and to *un-sustainability*.

Summarising the impact of income on life satisfaction, it is uncontested that higher income contributes to life satisfaction, as it reduces income uncertainty, providing financial safety and access to position goods. Additional income, however, has – according to most studies – decreasing marginal returns, but this result has recently been put into question. Life-income profiles with consecutive modest increases are indeed preferred to those with constant income, and the race to acquire position goods appears to accelerate even further. The impact of relative income and income distribution is, nevertheless, considerably stronger than that of absolute income. However, the desire to improve one’s relative position and the craving for position goods and rank in society strongly boost growth, even in the richest countries – a set of conditions evidently detrimental to the potential transition path of the WWWforEurope project.

The impact of *inflation* on life satisfaction, if investigated at all, is estimated to be relatively small and weak. Under the aspect of the violent policy debate confronting unemployment with price stability, this is astonishing and stands in strict conflict with the direct assessment to be reported

in section 4.3.3. The coefficient of the inflation term is frequently insignificant in life satisfaction regressions (Di Tella and MacCulloch, 2004: 14); Alesina et al. (2001a) estimate that increasing inflation by one standard deviation (5¾ percentage points) reduces the share of the “very satisfied” by 3 percentage points. This implies a trade-off of 1¾% unemployment to 1% inflation, compared to the traditional misery index’s 1:1 trade-off. The estimates furthermore reveal differences in ideological positions: A rise in inflation of 10 percentage points reduces the share of satisfied right-wing persons by 7 percentage points, which is more than double the average, while left-wingers’ life satisfaction suffers more from unemployment (Di Tella and MacCulloch, 2004: 14, 19).

Few studies deal with the impact of the *environment* on life satisfaction. As the environment has many dimensions with a strongly diverse local impact, it is difficult to find relevant indicators in the SWB regressions, and the environment is frequently assumed to be internalised, such as, for example, in the case of air pollution in housing prices. Furthermore, while pollution has strongly decreased in the Western hemisphere, awareness of it has increased since the early seventies, so that the effects of the two tendencies on life satisfaction may to an unknown extent compensate each other. According to Rehdanz and Maddison (2005), using data on 67 countries between 1972 and 2000, cold temperatures increase life satisfaction, which implies a negative impact of global warming. Welsch (2002) found no effect of SO₂ concentration on life satisfaction in a cross section of 54 countries, while Boarini et al. (2012) found a rather small effect of air and no effect of water quality. In Luechinger’s (2009) careful study for Germany, which uses regional GSOEP data, SO₂ concentration negatively affects life satisfaction to an extent of about 1% to 1½% of household income. This is larger for individuals concerned about the environment and, contrary to earlier assumptions, Luechinger finds air pollution incompletely capitalised in the private housing market.

Geographical mobility definitely reduces life satisfaction: The longer individuals had lived at the same address, the higher was their well-being (Ballas and Tranmer, 2012), probably as a consequence of the better chances to build social and support networks. This is in accordance with the above-mentioned observation that single people appear to be on average less happy than married couples. Boarini et al. (2012) report significant lower life satisfaction of persons born abroad.

Life satisfaction studies do not deal with *growth* explicitly, instead addressing it indirectly via unemployment. “In the overall balance, happiness rises in booms because a one-point decrease in unemployment has at least twice as large an effect on happiness as a one-point increase in the inflation rate. Economic stability is a crucial goal for any society, due largely to the fact of loss aversion, whereby individuals hate to lose x dollars more than they love to gain x dollars. But economic stability is a quite different goal from long-term economic growth. Long-term growth has much less impact on human happiness than do human relationships in all their dimensions.” (Layard et al., n.d.: 66)

4.3.2.3 Social determinants of life satisfaction

A considerable body of knowledge has accumulated, not least in the field of experimental economics (see Fehr and Gächter, 2000 for an early survey), demonstrating that men’s

decisions not only rely on selfish economic motives but also on social considerations and fairness. Life satisfaction research enhances these perceptions, with income distribution and unemployment serving as good examples.

Alesina et al. (2001a) revealed, as already shown above, that unequal *income distribution* lowers life satisfaction. The effect is larger for the poor and for those with left-wing political beliefs, but it also affects total population. Corneo and Grüner (2000) distinguish a “homo oeconomicus-effect”, a “public values-effect” and a “social rivalry-effect”. The first one lowers the satisfaction of those immediately affected by the unequal distribution, the second affects those rejecting inequality, while the third involves keeping an eye on one’s respective own group: life satisfaction declines when reducing inequality enables a rival group to compete for the same position goods.³⁸ Tests using the International Social Survey programs 1992 for the USA, Canada, Australia, New Zealand, Norway, East and West Germany as well as five East-European countries suggest that the selfish homo oeconomicus-effect is the largest, but the public values-effect is strong as well. Norwegians and Germans have the most positive attitude toward redistribution, while Americans and Australians see it in the least favourable light.

The social component in the relation of *unemployment* to life satisfaction appears to be even stronger. “When we total up all the well-being effects of a rise in the unemployment rate, the loss to the rest of the population (which is a large number of people) is twice as large as the loss to the unemployed themselves.” (Layard et al., n.d.: 67) In addition to the psychological effect and the considerably smaller income effect, a social effect works, reducing the life satisfaction of those not affected by unemployment. A rise in unemployment by 5 percentage points – as frequently observed in these days – reduces the life satisfaction of the population (whether employed or not) by 0.06 units on a four-point scale. This is equivalent to a transition of more than 10% of the population to the next lower step (Di Tella et al., 2001), which is a rather strong effect. Even workers with a secure position lose satisfaction when general unemployment rises (Clark et al., 2008a).

The interpretation of the social effect of unemployment is still under discussion. Life satisfaction studies emphasise a “fear effect” (Di Tella et al., 2003: 809): High unemployment gives a signal to the still employed that their jobs could be endangered, and fear and stress reduce life satisfaction of normal job holders, while government employees are not affected (Luechinger et al., 2010). At least two arguments raise considerable doubt about this explanation. First, surveys do not offer evidence for a widespread fear of losing one’s job in normal times, not in even in ‘normal’ recessions. Second, surveys provide strong evidence that workers consider their own job to be at least twice as safe as jobs in general (Tichy, 2013), so that a widespread *general* fear is rather implausible. Justice and fairness considerations appear to provide a more plausible explanation.

There are no studies, nor surprisingly even methods, available for an exact comparison of the relative strength of the determinants of life satisfaction. The frequently used comparisons of

³⁸ Examples of this are rent provisions, enabling ‘lower classes’ to enter ‘good’ living quarters, or measures that give immigrants access to good schools. The current Austrian discussion on education can serve as an example as well.

additional income are not very reliable, as (absolute) income belongs to the less important (and even contested) determinants of life satisfaction, and the monetary evaluation of determinants such as health, marriage or freedom is already problematic. Given these warnings, some cautious hints are available. Boarini et al. (2012) conclude that sickness, isolation and lack of freedom are amongst the most important personal obstacles to life satisfaction, while poverty and unemployment are the most important economic ones. The quality of the environment did not come out as significant determinant of life satisfaction (see Table 8). The World Happiness Report (Helliwell et al., n.d.: 90) adds separation and widowhood as negative personal social determinants and social support as a positive one. Relative income, income distribution and position goods are not included in both evaluations, but other studies (see section 4.3.2.2 above) clearly show that they are highly relevant for life satisfaction. Social determinants are of some relevance in more altruistic cultures (Scandinavia), where employment and income distribution have an immediate impact not only on the concerned individuals but on society as a whole. In the more individualistic cultures (USA, Australia, New Zealand) they evidently have less weight.

Table 8 Relative effect sizes of different variables on satisfaction

Independent Variable Coefficient size relative to a doubling of income

Female	0.6*
Age	-0.4***
Number of children	-0.3
Born abroad	-1.9***
Small town	-0.6
Large city	-1.3**
Suburb	-2.0***
Log household income	1.0***
Not enough money for food	-6.2***
Unemployment	-3.1***
Health problems	-3.1***
Secondary education	1.5**
Tertiary education	3.0***
Married	1.7***
Have friends to count on	5.2***
Volunteering	2.5***
Aggregate average social trust	0.3***
Confidence in judicial system	1.1***
Afraid to express political views	-0.4
Freedom to choose what you do with your life	2.8***
Satisfaction with air quality	0.8**
Satisfaction with water quality	0.2
Safe walking alone	1.1***
Money or property stolen	-1.0**

Note: Stars denote the significance of the variable in regression model (3): ***p<0.01, **p<0.05, *p<0.1
 Source: Boarini et al. (2012, table 4); some signs changed according to table 3.

4.3.3 Life satisfaction and the goals of WWWforEurope

It is remarkable that the determinants of life satisfaction, revealed by SWB research, differ from those dominating the public debate. Growth *per se* and inflation have not been found to be particularly relevant for individuals' life satisfaction.³⁹ In assessing the results of SWB research it is important to keep in mind that the determinants of life satisfaction are not the respondents' answers to questions in the surveys but rather the results obtained by research: Based on the self assessment of people who consider themselves as satisfied (or not) with their lives, SWB studies search for the specific facts that make individuals more or less satisfied. These need not be the facts the individuals themselves are conscious of. People may misjudge the satisfaction resulting from their choices (Stutzer and Frey, 2007). Under uncertainty they tend to systematically depart from rationality, due to the complex task of assessing probabilities; they tend to choose alternatives which directly yield the highest utility, without taking into account the choice's effect on the utilities of future choices; they underestimate how quickly and how fully they adjust to changes, not foreseeing that their reference points will change (Rabin 1998). They continuously adapt their aspirations to new developments, thereby superimposing previous choices. Furthermore, their satisfaction with material things almost inevitably wears off within four to five years – the adaptation effect mentioned above. If asked *directly* about the problems concerning them most (so to say, the short term inverse of satisfaction), rather different assessments are indeed discovered. Table 9 reveals that in spring 2013 most Europeans were *personally* most concerned with inflation, which has neither been found as an important constituent of life satisfaction, nor has it been a real-world problem at this time. The problem mentioned second frequently when people are asked directly is unemployment, which in fact matches the results of life satisfaction research. The environment, the climate and energy belong to the least pressing problems in direct surveys – and these are probably even less significant as determinants of life satisfaction. For their *countries* – in contrast to themselves personally – respondents consider unemployment to be the largest problem, which implies that they do not feel that they could get involved personally – unemployment is evidently considered a problem for the other ones.⁴⁰ Inflation is relegated to third place in the survey's list of country problems; surprisingly, it is perceived as a high-ranking personal problem, less so as a problem for the country and even less so for the EU or the world. Climate and energy are in no case considered serious problems, neither personally nor for the country, nor for the EU, only attaining rank 12.

³⁹ Helliwell et al. (n.d.: 91) emphasise that GDP and its growth are at best means to an end, and the end is evidently life satisfaction. "The first lesson of happiness research is that GDP is a valuable goal but that other things also matter greatly. So GDP should not be pursued to the point where economic stability is imperilled, community cohesion is destroyed, the weak lose their dignity or place in the economy, ethical standards are sacrificed, or the environment, including the climate, is put at risk."

⁴⁰ Tichy (2013) calls this general phenomenon the "two-stage optimism gap": People strongly tend to assess their individual situation, as to their job or their financial situation, much more positive than those of their country, and those of their country better than those of the EU or even the world. Predominantly this may reflect an optimism bias, but a minor explanation could be a selection bias: As the Eurobarometer survey is based on telephone interviews in general, they may over-represent those with jobs, especially those with secure jobs.

Table 9 **Main problems indicated by EU respondents in spring 2013**

	respondent	For the country	EU
Inflation	41% (1)	20% (3)	13% (3)
Unemployment	22% (2)	51% (1)	38% (2)
Economic situation	18% (3)	33% (2)	48% (1)
Climate, energy	5% (12)	4% (12)	3% (12)

Source: Eurobarometer 79 (2013)

A similar result emerges when people are asked directly to which main goal the EU should aspire (Eurobarometer 78, 2012): 24% mentioned an increase in the standard of living, 22% suggested promoting growth, and 15% were above all for the maintenance of peace and stability, but only 5% thought it was most important to fight against “global threats (terrorism, climate change)”. Surprisingly, climate policy ranks higher in combination with the current crisis. If asked “For each of the following initiatives, please tell me how important or not you think they are in order for the EU to exit the present financial and economic crisis and prepare for the next decade” on a 10-point scale (Eurobarometer 78, 2012), 74% of the respondents indicate using fewer natural resources and emitting less greenhouse gas, superseded only by “modernise labour markets” and “help the poor and socially excluded” (both 80%). 26% of respondents claim to often buy environmentally-friendly products and 54% sometimes (Flash Eurobarometer 367, 2013: 12); primarily the elderly (55+) mainly buy these products, (32%) while the younger ones – contrary to expectations – refrain from doing so (15-24 15%; 25-39 22%). In general, one cannot suppress the supposition that citizens are aware of environmental problems, but evidently do not know how to act in response.

Table 10 Main country problems indicated by EU respondents in spring 2013

QA6a. What do you think are the two most important issues facing (OUR COUNTRY) at the moment?

	Un-employment	Economic situation	Rising prices\inflation	Government debt	Crime	Health and social security	Immigration	Taxation	Pensions	The education system	Housing	The environment, climate and energy issues	Terrorism
EU27	51%	33%	20%	15%	12%	11%	10%	9%	9%	8%	5%	4%	3%
BE	39%	29%	16%	22%	17%	4%	15%	17%	16%	3%	7%	3%	3%
BG	63%	51%	24%	2%	15%	17%	2%	3%	8%	6%	0%	3%	1%
CZ	44%	36%	30%	22%	14%	11%	3%	6%	14%	3%	4%	2%	1%
DK	61%	40%	6%	5%	18%	19%	10%	5%	2%	18%	1%	9%	1%
DE	21%	15%	24%	29%	15%	9%	14%	8%	18%	20%	6%	10%	4%
EE	34%	31%	51%	1%	7%	25%	3%	10%	12%	10%	1%	3%	0%
IE	67%	38%	16%	15%	16%	11%	7%	13%	1%	3%	3%	1%	1%
EL	65%	49%	10%	19%	10%	7%	6%	17%	4%	6%	0%	0%	1%
ES	79%	50%	7%	7%	4%	12%	2%	6%	4%	6%	7%	0%	1%
FR	66%	33%	17%	12%	19%	5%	8%	5%	11%	6%	10%	4%	2%
IT	58%	42%	22%	13%	6%	3%	4%	23%	5%	2%	2%	1%	1%
CY	72%	75%	3%	13%	8%	1%	4%	3%	1%	2%	1%	1%	1%
LV	55%	38%	16%	5%	5%	17%	9%	21%	12%	6%	3%	0%	1%
LT	46%	28%	36%	7%	15%	7%	11%	26%	5%	4%	1%	3%	0%
LU	43%	21%	22%	10%	13%	5%	13%	9%	8%	16%	25%	4%	1%
HU	60%	39%	24%	20%	14%	10%	2%	4%	6%	3%	4%	2%	1%
MT	17%	28%	24%	24%	6%	10%	29%	5%	11%	8%	3%	22%	1%
AT	31%	30%	38%	17%	8%	12%	12%	8%	12%	12%	8%	7%	1%
NL	51%	50%	7%	10%	11%	35%	4%	5%	8%	6%	5%	5%	1%
PL	69%	25%	34%	8%	5%	15%	3%	4%	9%	2%	3%	1%	2%
PT	72%	40%	24%	17%	3%	7%	1%	14%	8%	3%	0%	0%	1%
RO	33%	44%	35%	7%	19%	21%	2%	9%	11%	6%	4%	1%	1%
SI	49%	57%	10%	24%	26%	4%	1%	14%	5%	1%	1%	1%	1%
SK	59%	34%	36%	9%	8%	18%	0%	8%	10%	6%	4%	0%	0%
FI	47%	24%	20%	22%	7%	37%	5%	10%	9%	3%	5%	6%	0%
SE	65%	17%	1%	1%	10%	29%	13%	2%	4%	32%	5%	19%	0%
UK	36%	23%	10%	19%	18%	13%	32%	7%	7%	8%	7%	4%	8%
HR	76%	48%	17%	13%	21%	3%	1%	3%	5%	1%	2%	0%	0%

1st ITEM MOST FREQUENTLY MENTIONED
 2nd ITEM MOST FREQUENTLY MENTIONED
 3rd ITEM MOST FREQUENTLY MENTIONED

Source: Eurobarometer 79 (2013: 21)

Table 10 gives the full information on problems respondents saw at the country level when asked directly. The answers point towards interesting cultural differences (even) within the EU and considerably diverging views of various elements of sustainability. For example, Germany is the only country whose inhabitants consider government debt as the most pressing problem for *their* country (Germany’s government debt ratio is 81% compared to 85% EU average), while for Greece, Cyprus and Malta government debt ranks only third, and this is not at all considered a problem in the other GIPS countries. Austrians are similar to Germans in their elevated concern about government debt and inflation, while, somewhat surprisingly, the Finns are primarily concerned about health or health insurance and the Swedes about education. Neither pensions nor the environment are among the problems that seriously preoccupy European citizens if asked directly in the surveys. The same is true for terrorism, which in contrast with U.S. propaganda and media campaigns, is not considered a problem at all (the UK only to an extent mirrors the U.S.). As supposed by SWB research (see section 4.3.1), direct questions evidently reflect the immediate problems and feelings (affects) on the day of the poll.

While this paper deals with the life satisfaction aspects of SWB, a few remarks may be worth making with respect to the *affect balance*. Boarini et al. (2012) carried out the same regression for both aspects of SWB and found comparable determinants and signs; only being Female and

Being Afraid To Express Political Views changed signs. The coefficients, however, differed: Volunteering, Trust, Tertiary Education, Log Income and Unemployment have less than 40% of the impact on affect balance than they have on life satisfaction, while Children, Personal Safety, Freedom and Health have almost twice the impact (Boarini et al., 2012: 24).

All of this points towards the necessity of accurately distinguishing three different layers of contributing factors to *social* well-being:

- what individuals themselves consider the most pressing problems when asked directly;
- what turns out to have contributed to individuals' life satisfaction, as discovered by life satisfaction research, asking how satisfied people are with their lives on the whole nowadays; and
- what is sustainable in the long run, given the unintended consequences of pursuing intended and unintended individual goals, as revealed by direct questions or by SWB research.

The differentiation clearly reveals the most important result that a policy directly based on opinion polls would turn out to be myopic and unsuitable to bringing about life satisfaction. However, even a policy attempting to maximise peoples' (revealed actual) life satisfaction would be prone to reducing life satisfaction in the long run, as such a policy would necessarily neglect the externalities reducing life satisfaction in the long run, at least the life satisfaction of the next generation. *The specific task of the WWWforEurope project is to extricate the compatibility of the goals of these three layers and design a dynamic socio-ecological transition path to the social goals of high levels of employment, social inclusion, gender equity and environmental sustainability.* This is in accordance with the UN General Assembly, which has invited Member States to "pursue the elaboration of additional measures that better capture the importance of the pursuit of happiness and well-being in development with a view to guiding their public policies." (Helliwell et al., n.d.: 91) This is no easy task for at least three reasons:

- First, "in terms of public discourse, the well-being and sustainability debates have been held at some distance from one another. To date, research on thinking on well-being has often emphasized the contribution of psychological and psychosocial factors over actual material circumstances (such as individual wealth), with very little explicit consideration of the role of the environment or of ecological behaviour. ...
- [Second,] ... popular debate about sustainable development is conducted largely at the national level. Where reference is made to the impact of environment on individuals' well-being, it is usually to 'future generations' rather than those living now." (Thompson et al., 2013: 500).
- Third, it is widely believed that technical or institutional solutions rather than a change of individual behaviour can solve the problems.

Taking the three layers of contribution to subjective well-being into account, it is important to carefully work out their consistencies and incompatibilities. While compatibility may dominate in the short run, serious problems can arise in the long run, mainly due to sustainability. A social dilemma exists in the form of serious tensions between the elements of life satisfaction, involving behaviour that is not aimed at the environment, yet has a direct impact on it, at least in

the long term. However, environment is not the only aspect of sustainability. Not much less important are the ‘sustainabilities’ of full employment with secure and dignified jobs and an adequate work-life balance, of pensions⁴¹ and health systems, the position-goods rat-race, or of government finance. All these problems have trade-offs which are considered relevant by most people indeed, but are far from inducing the majority to change their behaviour. Citizens frequently find consolation in persuading themselves that they alone can’t change the disaster, or – as the Eurobarometer reveals – considering themselves not personally involved. In consequence, they complain about emissions, while marketing and buying high-emission cars,⁴² fighting violently against higher gasoline prices and striving for traffic-generating and energy-wasting single family houses. They fear old-age poverty (at least in the media, less so in the Eurobarometer, as shown in Table 10), but are neither prepared to work longer nor to agree to higher contributions. They lament overly high government debt, but reject a curtailing of public expenditure. As an excuse, they frequently cling to ‘technical’ solutions (which are supposed to work ‘automatically’ and do not afford any personal action or renunciation), even if experience has shown that no one technical solution has ever sufficed to solve environmental problems. The majority implicitly rejects the idea that a change in behaviour is indispensable and that policy will have to shift the incentive structure. Experts, however, say that “so-called ‘downshifting’ whereby people consciously adopt simple lower-consumption lifestyles ... are widely assumed to be required for a really substantive effect on the environment” (Thompson et al., 2013: 507). However, ‘downshifting’ is hampered by people, who are locked-in in individualism and materialism, resisting a change in their patterns of behaviour. In a relative way and to a lesser extent, absolute income and continuous augmentation of income are still the dominant targets.⁴³ As a solution, Singapore reports: „Citizens willing to trade civil liberties for a cleaner, safer and efficient society” (Weir, 2008). This unavoidably implies repressing regulations, a solution which indeed does not appear adequate for Europe.

4.3.4 Some reflections on policy solutions

In determining their goals, “[a]t present many countries use a traditional form of cost-effectiveness analysis, in which benefits are measured in money units on the basis of what citizens would be willing to pay for those benefits. This works quite well when the primary benefits are indeed financial or can be readily transferred into monetary equivalents. This is often true for policies on industry, transport, education and employment. However expenditure in these areas is often no more than a quarter or so of public expenditure. The bulk of public expenditure is on health, social care, law and order, the environment, child welfare, and income support. In none of these cases does willingness to pay provide adequate guidance to the

⁴¹ The literature on pension reforms almost exclusively suggests an increase in labour input as a solution, either through a longer life working period or higher participation, both of which imply higher production and consequently higher consumption (see e.g. Börsch-Supan, 2013), clearly contradicting the sustainability goals.

⁴² The German government, under pressure from the German car lobby, has recently used the trick of postponing a session in Brussels to delay the discussion on stricter emissions standards for cars.

⁴³ Thompson et al. (2013: 508) refer to an increasing literature which purports to demonstrate that holding a strongly materialistic value orientation is, all else being equal, detrimental to well-being.

benefits that arise. Happiness would be an excellent added criterion for evaluating these expenditures.” (Helliwell et al., 2013: 95)⁴⁴ Does this imply that governments should maximise life satisfaction? Starkly different views exist.

Following liberal conceptions, governments should “confine themselves to being just. We shall assume the responsibility of being happy for ourselves” (B. Constant in the 19th century, according to Mulgan, 2013: 518). Even if this is not the position of most of the current European governments, society inevitably “stopped telling people who they were, and instead it was let up to the individual to construct his or her own identity” (Baumeister, 1991: 95). “This construction of identity is not an easy task. ... Since both what we purchase and refuse to purchase plays an important role in defining our sense of identity, consumer choices also become an overwhelming concern.” (Ahuvia and Izberk-Bilgin, 2013: 484) In Ancient Greece, Aristotle argued that happiness was the only good that was “good in itself.” This argument still has relevance, but maximising life satisfaction under the modern aspects of citizens’ uncertainty would be a mixed blessing, given the evidence of the contrasting goals of the above-mentioned three layers. Even if they are less problematic than immediately relying on opinion polls (see section 4.3.3), attempts to maximise life satisfaction would combine the election-term myopia of governments with consumers’ disregard of long-term sustainability goals. The task is to find ways to maximise *life satisfaction under the restrictions of internalising externalities and taking proper account of sustainability*, not life satisfaction *per se*.

Neither national nor EU policies have been successful in this respect up to now. National policy exculpates itself with arguments of drawbacks in international competition and the inefficiency of national solo flights. EU policy, on the other hand, is advancing in big steps in some fields as liberalising markets or promoting competition, but it is much more hesitant towards promoting sustainable development, and the steps taken in this area are much smaller. To some extent, this is due to the heavy opposition of national governments, industries and electorates (see footnote 42 for an example), but to an even greater extent due to the heterogeneity of the EU and the complexity of the subject. The big differences in income and environmental damage among members require different country-specific solutions and exacerbate a common EU policy. Even worse, policy has to act against established consumption patterns and industry interests, some instruments are heavily contested, powerful instruments are wanting, and the mode of action and the power of new instruments are under discussion. Strong headwinds result from the “collective welfare optimism” (Hobsbawm, [1994] 1997: 531ff), increasingly opposing distribution.⁴⁵

Kasser (2006) proposed a threefold strategy to shift people’s values and goals, and thus behaviours: decrease the likelihood that people will be exposed to materialistic messages (e.g. banning advertisements to children, removing tax-write-offs for advertising), increase people’s

⁴⁴ As mentioned before, the authors use the term “happiness” even if they are fully aware of a risk of confusion, because “it does help to focus thinking, and attracts attention more quickly than does ‘subjective well-being’.” (Helliwell and Wang, n.d.: 11)

⁴⁵ This is reflected in the efforts of richer regions to separate by splitting (Slovenia, Czech Republic, Catalonia, etc.), and the increasing resistance against the welfare state and redistribution in general.

resilience to the materialistic messages that remain in the environment (e.g. by building intrinsic values, teaching individuals to decode advertisement messages), and help people to act more consistently with the intrinsic goals that they may value (e.g. encouraging ethical consumption and investments). This is fully correct but sounds somewhat naïve with regard to implementation, and one may doubt if it suffices to win the sustainability race. Much more is needed in order to shift incentives and change peoples' values and goals. Minority groups ('Greens') in the richer countries are already cautiously trying to approach a sustainable lifestyle (e.g. a shift from work/income to leisure, from prestige cars to public transport and bicycles, from accumulating goods to renting and sharing, etc.), but the development continues to go in the wrong direction, as majorities' behaviour over-compensates these hesitant beginnings. Prisching (2009) has worked out how difficult it is to change the current culture of consumption, and life satisfaction research has revealed the importance of monetary aspects. People feel happier if their income increases in the course of their life time, and position goods and at least relative (but also absolute) income continue to be highly decisive motives for the majority – despite the fact that position goods are a mixed blessing, immediately ceasing to be position goods (and therefore worth striving for) whenever they become available to those desiring them, and thus forcing individuals to aspire to obtaining other (inaccessible) goods – a vicious cycle, which keeps the growth race in motion.⁴⁶

Subjective well-being research teaches us that citizens' desires and attitudes diverge substantially from what is required for sustainability. The new WWWforEurope development strategy will have to strive for ways to get around this problem of changing peoples desires and attitudes, and devise ways to do so that are less restrictive and at the same time more comprehensive than Singapore's confinement of civil liberties. This involves a broad mixture of instruments. The current policy debate has become stuck in pro- and anti-growth ideologies, leaving aside the questions of the effects of potential EU solo flight on the world climate as well as the heterogeneity of the EU. However, the poorer member need both qualitative and quantitative growth in order to catch up, while the richer members will have to find ways to avoid further rounds of rising aspirations and induce citizens to downsize their demand at least quantitatively. Traditional goals will have to be reformulated to take care of trade-offs with other goals, and well-known instruments will have to be redesigned, with greater attention paid to their (unintended) side effects.

It cannot be the task of this paper to specify the policy needed to accomplish the new WWWforEurope transition path; it can merely provide a sketch of the goals to strive towards. Concentration on full employment will have to be retained as an important goal, but given the trade-off with environmental sustainability, higher growth should no longer be the dominant and single instrument applied in the richer countries. Other instruments will have to complement it, including the proper setting of incentives. The prevailing tax structure, for example, promotes

⁴⁶ Position goods are the carrot the donkey can never reach, but which keep him going. Nobody knows if the anecdotal donkey is as disappointed as the consumers, which after having attained a position good after long effort, realise that it is no longer a position good, as others dispose of it as well. And so the race for the new position good begins anew, sustaining growth rather than sustainability.

both labour-saving and resource- and energy-wasting technical progress,⁴⁷ giving incentives for decentralised housing and commuting and promoting energy supply (even if renewable) rather than energy saving. Even if a full-time job should be the goal of a policy, several forms of reducing working time could help to reduce unemployment. Needless to say, this would involve workers accepting the shift from work/income to leisure, which is not currently the case. The goals of social inclusion and gender equity should gain greater weight, and more than taxes, transfers or minimum shares of women in specific jobs will be required as instruments to accomplish them. Meanwhile, a broad revision of different facets of the social system, ranging from education and labour rules to the treatment of part-time work and child-bearing in taxation and social security, will prove unavoidable. Trade-offs towards budgetary stability, however, will have to be taken into consideration. Participation in all their dimensions should be promoted, as it increases life satisfaction; however, given citizens' goals and attitudes, it will not lead to more sustainability *per se*. Environmental sustainability, surely the goal least realised at the moment, not only affords the traditional instruments as promotion of renewable resources, recycling, regulation, taxation, internalisation or reliance on the price mechanism,⁴⁸ etc., which may imply trade-offs to full employment or international competitiveness; additionally, and more importantly, they require a far-reaching change in the behaviour of producers and consumers. Civil society will have a major role to play, in the form of environment-conscious groups setting the stage for more conservative consumers, as well as by firm-NGO-consumer interaction exploiting producers' reputation awareness.

4.3.5 Summary

The goal of WWWforEurope is to lay the analytical foundation for a new development strategy that will enable a dynamic socio-ecological transition to high levels of employment, social inclusion, gender equity and environmental sustainability. These goals do not appear to rank highly in populations', and consequently politicians', order of priorities. When asked directly, people rank price stability, employment and growth highest, while SWB research reveals employment, relative income and a continuous (small) rise in income as the main determinants among those goals, which can be influenced by policy. The order of preferences, indicated by both approaches, reveals serious sustainability problems, and, consequently, problems in designing the indispensable transition path to a more sustainable development: Environmental sustainability, probably the world's dominant problem today, ranks rather low in both cases. Growth *per se*, a goal still considered important, is not the dominant and only determinant of life satisfaction and has an unavoidable trade-off with environmental sustainability; the same trade-off exists with full employment, as long as growth is considered the dominant policy instrument to achieve it. Social inclusion appears to rank somewhat higher than environmental

⁴⁷ The economic policy discussion must redirect its focus from boosting labour productivity to boosting both resource productivity and total factor productivity.

⁴⁸ A good example is energy policy. The extreme rise of oil and gas prices in the last decades has had less effect on demand than on supply, exploiting new technologies.

sustainability amongst citizens' goals, but again a serious trade-off exists with the importance of relative-income position (and the acquisition of position goods) for their life satisfaction.

To change the path towards greater sustainable development, therefore, means carefully devising a consistent combination of a wide range of instruments. A considerable number of these have already been proposed and discussed, but they are in most cases isolated and there has been little consideration of trade-offs and consistency with other goals. The trickiest problem, however, has not even been afforded appropriate attention up to now, namely how to change citizens' goals and attitudes by primarily setting the appropriate incentives. If one can't find innovative solutions for this problem, it will prove impossible to design a promising transition path outside of an authoritarian regime.

4.4 Modelling the inter-linkages between macroeconomic, social and ecological aspects of a sustainability transition and long-term growth

Kurt Kratena (WIFO), Mark Sommer (WIFO)

4.4.1 Introduction

This section of the FBC report describes the role of a macroeconomic model developed at WIFO for the analysis of trade-offs and potential synergies between environmental, macroeconomic and labour market policies. The model is informed by policy insights developed in the different Areas of the WWWforEurope project. In section 4.4.2, we describe the main features of the model which are seen as relevant for the issues of long-term growth and environmental decoupling, as well as for labour market policies aiming at a reduction of the high unemployment rates in the aftermath of the Great Recession.

Section 4.4.3 presents some stylized facts about GDP growth, energy and GHG emissions before and after the crisis, with a focus on the Spanish economy. At the same time, it shows the development of the main indicators of labour market functioning during the same period. These stylized facts are linked to the relevant elements of the model described in the first section.

Finally, section 4.4.4 takes the inter-linkages between the Areas, as identified by them, as a starting point for the synthesis of the project. There are various inter-linkages between the issues studied in the five areas (for example: innovation (Area 3), the environment (Area 2) and the labour market (Area 4)). Taking the inter-linkages as a starting point, the derivation of a maximum potential menu of model simulations is possible. The basic idea behind that is that a macroeconomic model is a suitable method to analyze the trade-offs, synergies and cross-cutting issues in the project.

4.4.2 The DYNK modelling approach

The model approach used by WIFO in the WWWforEurope project can be characterized as a DYNK (DYnamic New Keynesian) model which reflects New-Classical macroeconomic theory models with rigidities and institutional frictions. In this sense, the model bears some similarities with WIFO's DSGE (Dynamic Stochastic General Equilibrium) model which recently was intensively used for the analysis of labour market policy in the WWWforEurope project (Busl and Seymen, 2013) as well as in other studies (Faia et al., 2012).

This approach builds upon an EU 27 model (FIDELIO 1⁴⁹) which was based upon inter-regional Supply-Use tables (Kratena et al., 2013). The model philosophy and the main features have been described in Kratena and Streicher (2014). Although the DYNK model shares some characteristics with the "General Equilibrium" approach, other aspects differentiate the "DYNK" approach from the CGE long-term equilibrium approach. The characterizing feature of an explicit dynamic adjustment path towards equilibrium is most developed in the consumption block and in the macroeconomic closure via a fixed short and long-term path for the public deficit. The term "New Keynesian" refers to the existence of a long-run full employment equilibrium, which will not be reached if you depart from a disequilibrium in the short run, due to institutional rigidities. These rigidities include liquidity constraints for consumers (deviation from the Permanent Income hypothesis), wage bargaining (deviation from the competitive labour market) and imperfect competition and are thought to describe the 'real world' economy better than the standard assumptions in most CGE models. Depending on the magnitude of the distance of the economy from long-run equilibrium, the reaction of macroeconomic aggregates to policy shocks can differ substantially.

The DYNK is first developed for a periphery country (Spain) that serves as a prototype model and depicts growth drivers, resource use and the labour market. The model has various unique features, such as a detailed description of production and consumption, long-term equilibrium and constraints, and explicit adjustment paths towards this equilibrium. The national model for the periphery country has been extended during the WWWforEurope project towards a model for the EU 27, treating the EU 27 as one economy.

Household behaviour:

The consumption decision of households in the DYNK model is modeled along the lines of the 'buffer stock model' of consumption, including the consumption of durables and nondurables. This theory has challenged the life cycle/permanent income hypothesis by providing theoretical underpinnings for the different empirical puzzles which are not compatible with consumption

⁴⁹ (<http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=6241>)

being totally dependent on permanent income (and not on current income). The motivation for dependence of consumption on current income can be found in the existence of liquidity constraints and 'buffer stock' savings behavior in order to build up reserves for unexpected events and expenditure (Carroll, 1997). A version of the buffer stock model, where households save for the purchase of durables, is described in Luengo-Prado (2006). Consumers maximize the present discounted value of expected utility from the consumption of nondurable commodities and from the service provided by the stocks of durable commodities, subject to the budget and collateralized constraints. The consideration of the collateralized constraint is operationalized in a down payment requirement parameter, which represents the fraction of durables purchases that a household is not allowed to finance.

We follow this basic concept of Luengo-Prado (2006) by deriving demand functions for durable and (total) nondurable demand which are consistent with the main properties of the conditions for an optimal dynamic consumer model. One of these properties is a long-run equilibrium between voluntary equity holding and permanent income. Voluntary equity is defined as the equity holding that exceeds the necessary equity for the down payment of durables and therefore comprises of assets as well as the part of the capital stock that can be financed (without holding liquidity). Permanent income is derived by decomposing disposable income into an autoregressive process and transitory shocks.

The demand for the durable stock is, following Luengo-Prado (2006), modeled with a non-constant marginal propensity of durable consumption to 'cash in hand', so that with higher levels of durable stock per household, the marginal propensity of durable consumption decreases. The durable demand is further influenced by the down payment, as well as the user costs of capital. The final equation in the DYNK model is a dynamic specification of a stock adjustment model with an implicit optimal (= long-run) stock equation. This is consistent with an error correction mechanism (ECM) for stock adjustment as described in Caballero (1993).

The demand function for total nondurable consumption is modeled with a positive marginal propensity of nondurable consumption to 'cash in hand' and a negative marginal propensity of total nondurable consumption to the product of the down payment (in percentage of durables) and durable demand. This is consistent with the solution in Luengo-Prado (2006), where the sum of nondurables and the downpayment (in level) are modeled as a function of 'cash in hand'.

The demand functions for durables and total nondurables represent the first stage of the consumption module in the DYNK model. Both functions have been estimated with panel data econometrics for 14 EU countries (1995-2011), based on Eurostat and other sources. Non-linear relationships of durable consumption and 'cash in hand' have been identified from these estimations and have been corroborated by cross section estimations based on the Household Financial and Consumption Survey (HFCS) of the ECB. The categories of durable consumption in our model comprise of investment in homes and the purchase of a vehicle. Due to the

specific treatment of housing in the consumption accounts of national accounting, investment in homes is pooled together with other dwelling investments to derive total dwelling investment. Given the demand and the accumulated stock of homes, imputed rents are calculated using a user cost formulation. These imputed rents enter the consumption accounts. The expenditure for imputed rents, vehicles and total nondurables adds up to total private consumption.

An important property of the model is that *ceteris paribus* a higher liquidity constraint yields lower levels of durable and nondurable consumption at the same level of 'cash in hand'. Therefore the marginal propensity of durable and nondurable consumption with respect to 'cash in hand' is higher when the liquidity constraint is higher. That, in turn, leads to higher income multipliers of fiscal policy when the liquidity constraint is higher.

The first consumption model is closed by adding the budget constraints derived from the definitions of the sectoral accounts in national accounts. These comprise of the derivation of primary income from value added components (wages and operating surplus) and disposable income from the financial flows between households and government. Disposable income yields together with total consumption, the building stock of households, the net lending of households and the accumulation of assets. The savings behaviour of households is guided by the properties of the buffer stock model and savings decisions have a long-run impact on the consumption potential via asset and debt accumulation and the property income as well as interest payment flows resulting from the stocks.

The second stage of the consumption module describes the energy demand of households, i.e. fuel demand for transport, as well as electricity and heating demand. These demands are part of total nondurable consumption and are modeled in single equations, which assume the ability to separate energy from non-energy nondurable consumption. This is in line with the literature on the rebound effect (e.g.: Khazzoom, 1989), where the energy demand is determined by the utilization of household's capital stock and therefore separable from other demand categories. According to this literature the energy demand is modeled as (nominal) service demand and the service aspect is taken into account by dealing with service prices. The durable stock of households (vehicles, houses, appliances) embodies the efficiency of converting an energy flow into a service level. For a given conversion efficiency, a service price (marginal cost of service), can be derived, which is a function of the energy price and the efficiency parameter. Any increase in efficiency leads to a decrease in the service price and thereby to an increase in service demand ('rebound effect').

The non-energy demand of nondurables is treated in a demand system that represents the third stage of the consumption module. We apply the Almost Ideal Demand System (AIDS) that gives us budget share equations for the i non-energy nondurable goods in each period.

Both the equations in stage 2 of the model as well as the demand system of stage 3 have been estimated with panel data for EU 27 countries (1995-2011), as well as in a cross section regression, based on the aggregate results of the Household Budget Surveys (HBS) for five household groups (income-quintiles).

The estimation results of the three stages of the consumption model are used to calibrate the model at the level of five income-quintiles. For this part of the model EU SILC data have been combined with data from the HFCS of ECB. The EU-SILC data have been adjusted to the national accounts totals and all interactions between the household and the government sector from sectoral accounts have been built in. Due to the specification of the non-linear demand functions the marginal propensity of consumption depends on (fixed) parameter values and the durable endowment per household for a given liquidity constraint. That leads, together with significantly different endowments of durables, to significant differences in marginal propensities of consumption across income quintiles.

Firm behaviour:

The production side in the DYNK model is analysed within the cost and factor demand function framework, i.e. the dual model, using a Translog specification. The representative producers in each industry all face a unit cost function with constant returns to scale that determines the output price (unit cost), for given input prices. The input quantities follow from the factor demand functions, once all prices are determined. The Translog specification chosen in the DYNK model comprises of different components of technological change. Autonomous technical change is assessed for all input factors (i.e. the factor biases) and also as the driver of TFP (total factor productivity), measured to include a linear and a quadratic component.

The Translog model is set up with inputs of capital (K), labor (L), energy (E), imported (M^m) and domestic non-energy materials (M^d), and their corresponding input prices p_K , p_L , p_E , p_{M^m} and p_{M^d} . Applying Shepard's Lemma yields the cost share equations in the Translog case, which in turn are used to derive the quantities of factor demand for (K), (L), (E), (M^m) and (M^d). For this production system the input prices can be viewed as exogenous. One part of the input prices is determined at national or global factor markets, which applies to the prices of (K), (L), and (E). The price of labour is determined at the labour market via wage functions by industry (see below). The price of capital is formulated as a simple static user cost price index with the following components: (i) the price of investment by industry, (ii) the smoothed interest rate, and (iii) the fixed depreciation rate. The financial market and monetary policy are not described in detail in the DYNK model, therefore the interest rate is assumed to be exogenous and is approximated by the smoothed benchmark interest rate. The depreciation rate by industry is fixed (see below for data sources) and the price of investment by industry is endogenously

derived from the price system in the DYNK model. The price of energy carriers is assumed to be determined at world markets for energy and is therefore treated as exogenous.

The price system in the DYNK model comprises of the two components of domestic commodity prices and import prices. Domestic commodity prices are derived from output prices, which in turn follow from the production system, and the make matrix of the input-output system. Import prices are assumed to be exogenous for the national models as well as for the 'EU 27 block' model. The domestic commodity prices and the import prices are multiplied by domestic and import shares of the investment, the consumption vector of the use table, with an investment and a consumption bridge matrix in order to arrive at the prices of investment by industry and of consumption by category. Therefore, in fact, an important part of the input price system is endogenous in the DYNK model.

All data for the production system are derived from the WIOD (World Input Output Database) dataset that contains World Input Output Tables (WIOT) in current and previous year's prices, Environmental Accounts (EA), and Socioeconomic Accounts (SEA). The latter are used to derive data for capital and labour, like the base year capital stock and depreciation rates as well as labour compensation by hour and by person. From the EA we use data of energy use by 25 energy carriers in physical units (TJ) and CO₂ emissions and combine the physical energy inputs with information on energy prices from the IEA to get a full system of energy quantities and prices. The WIOT in current and previous year's prices have been used to derive quantities and prices for (M^m) and (M^d).

The system of the unit cost function and the factor cost shares has been estimated with panel data econometrics for 23 EU countries with time series from 1995 to 2009. The estimation results yield parameter values for all price terms which together with the factor cost shares give the own and cross price elasticity according to the formulae for the Translog model. These elasticities have then in turn to be used to calibrate the production system for the DYNK model base year (2005) and for the corresponding country (Spain and the 'EU 27 block'). Additionally, the estimation results comprise parameters for the different components of technical change that are considered in this production model: (i) TFP growth that shifts the unit cost function, and (ii) the factor biases that shift factor input demand (per unit of output). Both components are identified by different parameters (one for TFP and one for each factor bias). As in the Translog case regularity is not guaranteed, i.e. the factor shares can lie outside the [0,1] interval for some values in the input price space, the parameters are not always kept constant over time.

This specification of production leads to endogenous aggregate parts of the full use matrix of the IO system: total energy inputs, total non-energy domestic inputs and total non-energy imported inputs are determined via the factor demand equations. The input-output model uses fixed 'use-structure' matrices to further disaggregate these aggregates in the input-output coefficients.

Important envisaged extensions of the current model version comprise of the specification of imperfect competition and directed or induced technological change. In the current version output is exhausted by the factors and therefore the share of K is defined by operating surplus, which actually is a residual in national accounts. The factor price of K that influences factor demand of K is on the other hand defined as a user cost price index. Therefore, two prices of K are present in the DYNK model: the user cost based price and the implicit price (or *ex post* price), determined by the capital stock and operating surplus. An equation that assumes a long-run convergence of the implicit price towards the user cost based price links both prices. An extension of this version consists of specifying the factor share of K by the user cost price and add an output price equation that disentangles TFP and a mark-up on costs in the line of Hall (1988) and Roeger (1995). This would then in turn determine operating surplus and the implicit price of capital.

Another extension concerns a more explicit treatment of technological change. In addition to TFP growth and the factor biases, bottom up changes in the input-output structure are included. These can be driven by innovation which in turn drives the unit costs of new technologies via 'learning curves' and therefore the diffusion of new technologies.

A Translog model for energy demand composition ('fuel mix') with five main energy categories and fixed sub-shares for the 26 energy carriers complements the model of the production side. The fuel mix-model allows for the endogenous derivation of CO₂ emissions.

Other model blocks:

The main factor market that is modeled endogenously in the DYNK model is the labour market. Boeters and Savard (2013) provide an overview of integrating the labour market in CGE models. The theoretical approaches presented are confronted with the results from empirical wage curve estimation, which can be seen as a robust empirical relationship (see also Card, 1995 and Blanchower and Oswald, 1994). The wage curves in the DYNK model are specified as the employees gross wage rate per hour by industry. By adding the employers' social security contribution to this, the labour price (index) is then obtained. Combining the *meta-analysis* of Folmer (2009) on the empirical wage curve literature with a basic wage bargaining model from Boeters and Savard (2013) gives a base specification for the sectoral hourly wages. These functions describe the responsiveness of hourly wages to labour productivity (industry, aggregate), consumer prices, hours worked per employee, and the rate of unemployment. Envisaged additions to that include the impact of the probability to fill a vacancy (which in turn depends on matching efficiency) on hourly wages. The inclusion of the variable 'hours worked per employee' corresponds to a bargaining model, where firms and workers (or unions) bargain over wages and hours worked simultaneously (Busl and Seymen, 2013). The basic idea is that the gains in labour productivity can be used for cutting hours worked and wage increases

simultaneously. We specify the wage function in a way that the hours can be determined in a first step and then the hourly wage rate is determined. Wage bargains over hours that lead to less hours worked per employee increase the hourly wage rate, so income per year does not fall in proportion to the reduction in working time. The parameter estimated for labour productivity is conditional on this impact of working time on hourly wages.

Folmer (2009) gathers and computes 1004 elasticities of pay in disaggregated (industry or labour market segment) macro equations. The results of this *meta-study* are compared to the estimation results we derive from a panel of 17 EU countries, based on the SEA of the WIOD dataset.

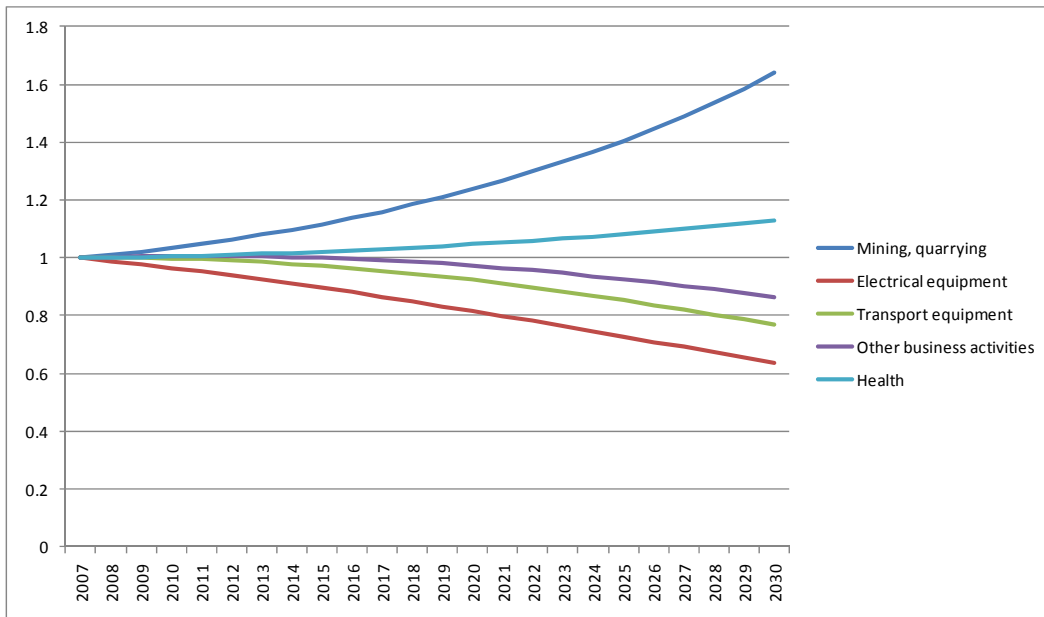
The public sector balances close the model and show the main interactions between households, firms and the general government. As we put special emphasis on labour market policies, unemployment benefits are separated from the other social expenditure categories. Taxes from households and firms are endogenized via tax rates. The path of the deficit per GDP share is included as a restriction according to the EU stability programs. This restriction leads to an endogenous proportional adjustment of other taxes, transfers, and public consumption, so that the public deficit target is met.

4.4.3 Stylized facts of long-term growth, the environment and the labour market

Short-term ('post crisis') policy issues, such as the convergence to a sustainable growth path with the restriction of debt deleveraging (austerity) and long-term environmental targets or the reduction of high unemployment can be analyzed with the help of the DYNK model described. Furthermore it can also be used to analyse the long-term issues of transition and growth. Examples would be globalisation and the welfare state, demographic change, energy and resource saving innovation or macroeconomic policies.

Long-term growth is driven by the annual TFP growth rates. Figure 22 shows the isolated impact of TFP growth in different industries resulting from the econometric estimation of the Translog model for 23 EU countries. In the dual model (cost function) the impact of TFP growth consists of a decrease in output prices which in turn increase real income and thereby balance supply and demand. This is how the supply side factor of TFP growth materializes in an increase of output in the DYNK model.

Figure 22 **The impact of TFP growth by industry on output prices**



Source: own calculations

A forecast until 2030 shows considerable accumulated TFP increases for some selected industries and also for business services. Two out of 59 industries reveal a long term decrease of TFP, which can be explained by underlying 'cost disease' problems of these industries (mining and health services). The impact of this productivity decrease in mining and health services exerts a continuous upward pressure on output prices.

Long-term output growth is only compatible with absolute reductions of resource use if technological progress leads to high rates of decoupling. One source of technological progress in the DYNK model is the factor biased technological progress that is shown for energy (E) in Table 11. This biased technological progress can show a negative or positive sign, i.e. can be factor using or saving. For a number of industries the factor bias is energy using, so that this component does not directly contribute to energy saving.

Table 11 **The annual impact of the factor bias on factor share, E**

ρ	E
Agriculture,	0.0001
Mining, quarrying	0.0007
Food, beverages	0.0001
Textiles	-0.0002
Leather, footwear	0.0032
Wood and cork	0.0001
Pulp, paper	0.0002
Coke, refinery	0.0000
Chemicals	0.0002
Rubber and plastics	-0.0007
Non-metallic minerals	-0.0009
Basic metals	-0.0002
Machinery	-0.0008
Electrical equipment	-0.0004
Transport equipment	-0.0008
Other manufacturing	0.0002
Electricity, gas, water	0.0048

Source: own calculations

Table 12 **The annual impact of the factor bias on factor share, L**

ρ	L
Agriculture,	-0.0033
Mining, quarrying	-0.0096
Food, beverages	-0.0001
Textiles	-0.0010
Leather, footwear	0.0053
Wood and cork	-0.0019
Pulp, paper	-0.0019
Coke, refinery	0.0000
Chemicals	-0.0023
Rubber and plastics	-0.0043
Non-metallic minerals	-0.0041
Basic metals	-0.0036
Machinery	-0.0037
Electrical equipment	-0.0045
Transport equipment	-0.0067
Other manufacturing	-0.0062
Electricity, gas, water	-0.0055

Source: own calculations

The impact of the factor bias on factor demand represents only one potential impact factor and describes a *ceteris paribus* effect. It needs at the very least to be considered together with the impact of TFP (Table 13) that decreases unit costs and therefore also costs for all inputs. In this broader picture technological progress turns out to have a more significant negative impact on energy use. At the same time, TFP is a driver of output growth (this effect is not considered in Table 13) and thereby increases factor demand, both for energy and for labour. These macroeconomic feedback mechanisms limit the potential of technological progress to decouple

resource use from output growth. Policies that take these economic feedbacks into account therefore need to address also the question of influencing factor prices in order to counterbalance the rebound effects of technological progress.

Table 13 **The total annual impact of technological progress on factor demand (factor bias plus TFP by industry)**

	K	L	E	M ^m
Agriculture,	-0.104	-0.023	-0.011	0.008
Mining, quarrying	-0.007	-0.034	-0.036	-0.003
Food, beverages	-0.011	-0.028	-0.026	-0.006
Textiles	-0.007	-0.018	-0.006	0.023
Leather, footwear	0.002	-0.027	-0.067	-0.008
Wood and cork	-0.034	-0.043	-0.058	0.001
Pulp, paper	0.019	-0.050	-0.066	0.006
Coke, refinery	-0.045	-0.034	0.000	0.013
Chemicals	0.011	-0.025	0.040	-0.002
Rubber and plastics	0.022	0.000	0.008	0.021
Non-metallic minerals	-0.015	-0.017	0.013	0.009
Basic metals	0.069	-0.030	0.046	0.041
Machinery	-0.010	-0.022	-0.046	0.009
Electrical equipment	-0.011	-0.017	-0.068	-0.012
Transport equipment	0.010	0.007	-0.013	0.014
Other manufacturing	0.002	-0.016	0.028	0.046
Electricity, gas, water	0.000	0.000	0.000	0.000

Source: own calculations

One option of influencing factor prices in order to mitigate rebound effects consists of changing the tax structure of input factors, such as through an environmental tax reform: higher taxes on CO₂ generating energy and lower taxes on labour. In the Translog production model of the DYNK model this leads to direct substitution effects and in a second step to macroeconomic feedback effects, which in turn influence factor demand. An important issue in the literature of K,L,E,M factor demand functions was the question whether capital and energy were complements or substitutes. In the case of complementarity, no *win-win* situation of energy decoupling and growth is easily feasible, but energy mainly decreases with a reduction of investment and output. The factor demand elasticities with respect to the price of energy in Table 14 reveal positive cross price elasticities between energy and capital, i.e. substitution in the following energy intensive industries: chemicals, basic metals and electricity/gas/water. Therefore, in those industries higher effective energy prices due to CO₂ taxation or permit auctioning would lead to more investment (new equipment) accompanied by energy saving. This mechanism can be seen as embodied technical change, as already existing technologies with lower energy requirement would be installed. This would also have a *ceteris paribus* beneficial effect on output, as the new capital goods need to be produced. For another two energy intensive industries (pulp and paper, as well as non-metallic minerals) capital and energy turn out to be complements. The same holds true for other important branches of manufacturing. These industries will potentially decrease output and investment as a reaction to CO₂ taxation or permit auctioning and thereby enhance structural change towards less energy intensive industries. Table 14 also gives an indication that price measures (taxation or permit auctioning) work well, due to significant own price elasticities of energy.

In the case of labour (Table 15) capital and labour are substitutes in almost all industries and the own price elasticity of labour is larger in magnitude than the own price elasticity of energy. Therefore an environmental tax reform that lowers wage costs will induce some deceleration of the substitution of labour by capital and labour demand will increase also due to the own price elasticity.

Table 14 **Price elasticities wrt the price of E**

	E	K	L	E	M ^m
Agriculture,	0.052	0.616	-0.101	0.450	
Mining, quarrying	0.503	0.150	-0.911	0.224	
Food, beverages	-0.252	-0.642	-0.058	0.562	
Textiles	-0.194	0.725	-0.150	1.603	
Leather, footwear	1.241	-4.202	-2.646	3.376	
Wood and cork	0.258	0.501	-0.642	0.643	
Pulp,paper	-0.092	0.239	-0.391	0.857	
Coke, refinery	0.000	0.000	0.000	0.000	
Chemicals	0.329	0.173	-0.267	-0.058	
Rubber and plastics	-0.312	0.272	-0.169	0.348	
Non-metallic minerals	-0.091	0.170	-0.189	0.281	
Basic metals	0.550	0.240	-0.491	0.762	
Machinery	0.138	0.256	-0.116	-0.044	
Electrical equipment	-0.811	-0.267	-0.174	0.490	
Transport equipment	-0.620	-0.122	-0.101	-0.208	
Other manufacturing	0.424	-0.293	-0.431	0.169	
Electricity, gas, water	0.292	0.096	-0.527	0.219	

Source: own calculations

Table 15 **Price elasticities wrt the price of L**

	L	K	L	E	M ^m
Agriculture,	-0.037	-0.349	0.055	0.095	
Mining, quarrying	0.192	-0.373	0.050	0.034	
Food, beverages	0.063	-0.666	-0.085	0.125	
Textiles	0.264	-0.622	0.076	0.071	
Leather, footwear	0.234	-0.938	-0.277	0.188	
Wood and cork	0.125	-0.614	0.062	0.137	
Pulp,paper	-0.015	-0.526	0.031	0.136	
Coke, refinery	0.000	0.000	0.000	0.000	
Chemicals	0.063	-0.866	0.072	0.312	
Rubber and plastics	0.117	-0.571	0.046	0.253	
Non-metallic minerals	0.132	-0.543	0.051	0.123	
Basic metals	0.106	-0.622	0.046	0.430	
Machinery	0.084	-0.630	0.023	0.266	
Electrical equipment	0.218	-0.536	-0.012	0.208	
Transport equipment	-0.229	-0.518	-0.008	0.400	
Other manufacturing	-0.064	-0.579	-0.018	0.210	
Electricity, gas, water	0.283	-0.513	0.210	-0.095	

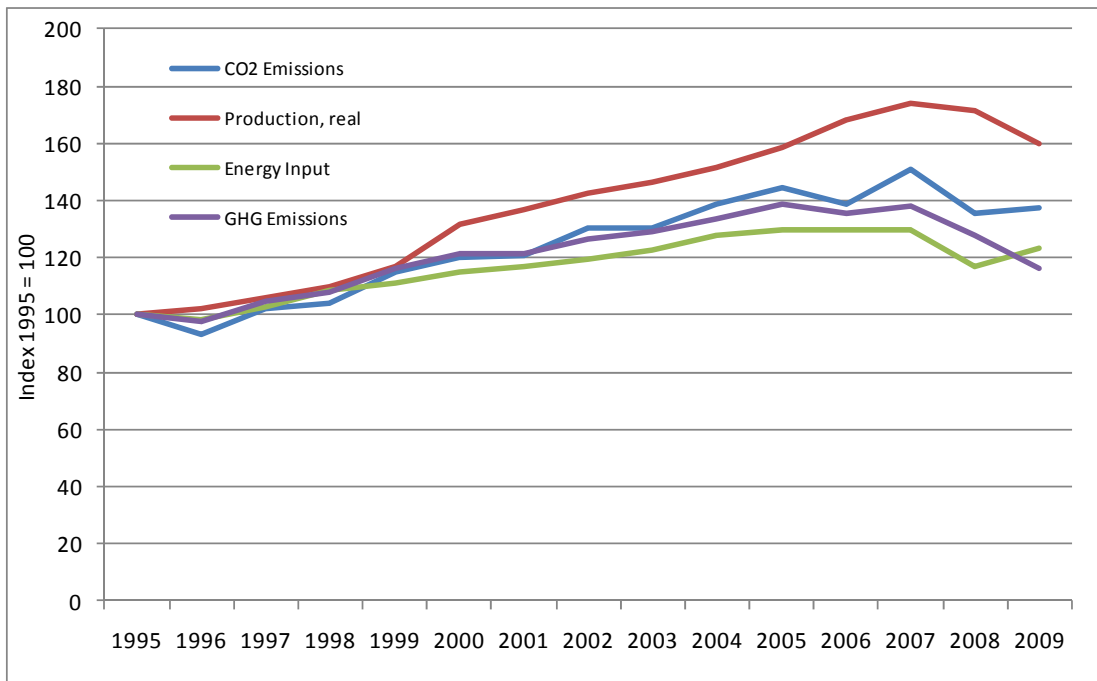
Source: own calculations

The historical data for gross output, energy demand and GHG emissions between 1995 and 2011 (Figure 23) might give a first indication of the importance of resource decoupling from output growth. Here it is important to note that the period from 2001 to 2007 has been one of exceptionally high economic growth. One observes relative decoupling of energy from output without an absolute decrease of energy consumption. At the same time the data for emissions reveal "negative decarbonisation" as GHG emissions decrease less than the total and emission relevant energy input. This has happened despite significant support for electricity generation from renewables by the Spanish government in this period and is driven by a strong increase in gas demand, which partly means a substitution of renewables (notably biomass) by fossil fuels, driven by an expansion of the gas network.

As has been noticed above, the period 2000 to 2007 is characterized by very high growth rates of GDP and income which came to a sudden stop with the financial crisis, revealing severe problems of debt leverage in Spanish households. This in turn leads to the question, if output growth 2000-2007 in Spain was sustainable in economic terms. If this has not been the case, then the trade-off between resource use reduction and economic growth is partially offset and enhancing economic sustainability in the high growth-period would also have reduced energy use and emissions. The way to answer this question can be directly linked to the potential output concept. As Borio et al. (2013) have recently put forward, the traditional and still widely used potential output concept using inflationary pressure and the NAWRU concept might not fit well in the current period of much more flexible labour supply reactions (immigration) and different elasticities of wage setting to price shocks than in the two decades between 1970 and 1990. The alternative suggested by Borio et al. (2013) is a potential output concept along the lines of a model of the financial cycle. This model integrates financial variables (credit growth, house prices) in the estimation of the potential output and thereby identifies an output gap. The results of this exercise for Spain show a very high negative output gap (i.e. actual output was above potential) in the period 2000 to 2007. If this concept could be integrated into the household model described in the first section above, the impact of 'unsustainable economic growth' on the environment could be assessed with the DYNK model.

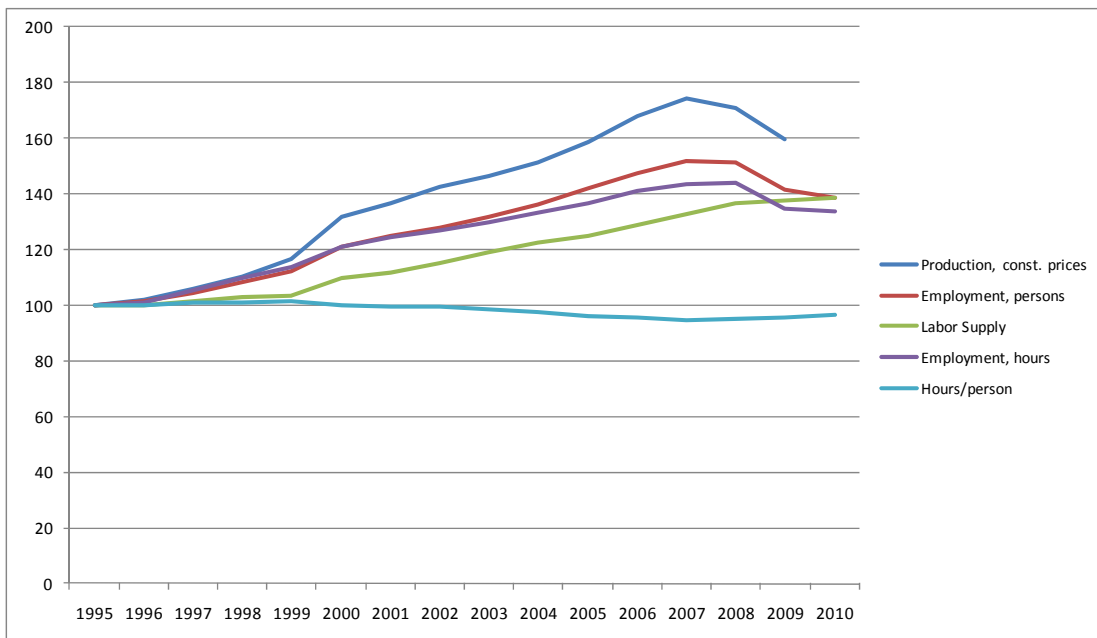
Figure 24 shows the development of employment, labour supply and hours worked in Spain between 1995 and 2011. It reveals that hours per person have decreased only slightly. Comparing the labour demand development relative to output growth with the energy demand relative to output one can see that labour productivity growth has been considerably below energy efficiency improvement. Labour supply (in persons) has increased considerably less than labour demand. This development led to a significant reduction in the unemployment rate in Spain until 2007 (Figure 25).

Figure 23 **Gross Output, Energy Demand and Greenhouse Gas (GHG) emissions: Spain 1995 - 2009**



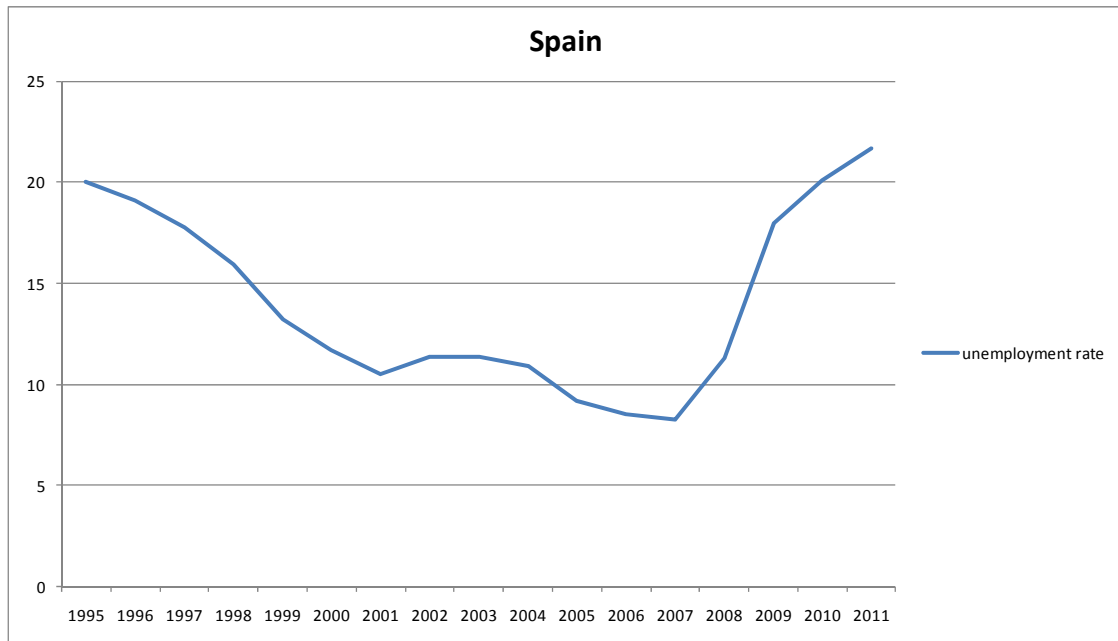
Source: Eurostat and own calculations

Figure 24 **Gross Output, Labor Demand, Labor Supply and Hours Worked: Spain 1995 - 2011**



Source: Eurostat and own calculations

Figure 25 **Rate of Unemployment: Spain 1995-2011**



Source: Eurostat and own calculations

The stylized facts show the relationship between the most important variables for policy simulations in the project in the recent past and the most important mechanisms in the DYNK model to influence these variables.

4.4.4 Inter-linkages and modelling work

This section takes the work done in the project on inter-linkages between Areas at the level of work packages (WP) as a starting point. From the full matrix of inter-linkages set up by the consortium partners, those that have been identified by both Areas and dealing with crucial issues from the perspective of the synthesis of the project following can be highlighted in the first place. For the further analysis here, from this list those inter-linkages have been picked that are relevant for model simulations in Area 6.

In Area 1, WP103 and WP104 are linked to Area 2 (WP203, WP205) and Area 5 (WP502, WP503). These work packages in Area 1 (WP103, WP104) deal with welfare state issues and socio-demographic change and welfare state reform. The linkages refer to transition aspects, the construction of a long-term scenario for Europe, labour market policy and the issues of integration policy and societal diversity.

In Area 2, WP203 and WP205 are linked to Area 1 (see above) and also to Area 3 (WP303). These two work packages in Area 2 are dealing with behavioural aspects of transition and the economic modelling of integrating biophysical constraints and policies to meet these constraints by additionally taking into account targets of employment and social inclusion. The linkages refer to transition aspects, the construction of a long-term scenario for Europe and the role of green innovation for employment and growth.

The linkage between the modelling work in Area 2 and the role of green innovation for employment and growth can also be identified as the central link of Area 3 (WP303).

Area 4 has the central linkage to the welfare state reform issues triggered by socio-demographic change and globalisation (see above) and the main issue which is relevant for modelling there is labour market policy. Besides that, Area 4 (WP402 and WP404) is also linked to Area 5 (WP502, WP504). These inter-linkages refer to policy implementation at the regional level.

The "baseline" scenario

The DYNK model for the EU 27 will be used in Area 2 in order to integrate biophysical constraints into the model and implement policies in order to respect these boundaries. This can be seen as the starting point of the use of the model in the project.

As a prerequisite for all model simulations, first a long-term "baseline" scenario has to be simulated with the model. Though the general "baseline" philosophy is to extrapolate trends, for several exogenous variables studies from different institutions can be used which incorporate changes and deviations from trends. This holds true especially for socio-demographic change. These changes, driven by national demography as well as by migration and the consequences of globalization for Europe can be seen as one set of challenges for a new European growth path. These challenges also represent the need for adaptation of the European welfare state model and the derivation of corresponding policy measures. These consequences are described in the research work in Area 1 and can be directly used for the "baseline" scenario until 2050. Demographic change has two channels of economic effects in the DYNK model: (i) labour supply by educational group and (ii) private consumption by category (Kim et al., 2013). Additionally, alternative demographic scenarios can be developed in order to assess the long-run economic impacts of alternative demographic assumptions (from the results of WP103).

The "resource use" scenarios

Based on research in Area 2, where global UNEP resource use scenarios have been scaled down and transcribed to the European level (Fischer-Kowalski et al., 2013), resource use scenarios shall be simulated in the DYNK model. The implementation of these scenarios, with fixed targets for resource use in 2050, into the DYNK model has two aspects: (i) implementing the constraints in the $K, L, E, M(m), M(d)$ structure of input substitution and choosing the adequate price instruments, and (ii) integrating a detailed modelling approach of resource saving technological progress via a model for the diffusion of new technologies. With regard to (i) the inputs $E, M(m)$, and $M(d)$ need to be linked to the physical material flows from the Environmental Accounts of the WIOD (World Input Output Database) dataset. Part of the physical material flows comprises of energy flows and another part comprises of other materials (like ores, non-metallic minerals and biomass).

The expected outcome of this exercise is a scenario with high resource prices, where physical constraints are binding and GDP growth might be below the "baseline" scenario. In the event that such a 'low growth scenario' is the result in the first place, additional policy scenarios shall

be developed for supporting the environmental targets and easing the costs of adjustment (tax reform, labour market policy, targeted R&D subsidies).

Tax reform

The starting point of tax reform concepts for Europe is the observation of relatively high tax wedges (although there is some heterogeneity in that aspect across EU member countries) between the take home pay of employees and employer's wage costs. Therefore lowering social security contributions of employers and employees, potentially with distributional aspects, should be the starting point of the analysed tax reform concepts in the project. In an *ex ante* revenue of a neutral tax reform concept, 'green taxes' shall be introduced or raised for compensation. Given the issues of energy costs and competitiveness ('carbon leakage') and the heterogeneity of the economic situation across European countries after the crisis, two different models of environmental tax reform shall be evaluated: (i) Traditional green tax reform, and (ii) Environmental fiscal devaluation.

The model of classical green tax reform consists of balancing lower social security revenues by taxing/auctioning permits per unit of resource use (e.g. 200 €/t CO₂ like in most scenarios in the EU Roadmap 2050) in consumption and production. The expected results are that it will be almost neutral for GDP and decrease energy consumption and CO₂ emissions both in consumption and in production, given the incentives. The industry will be partly relieved via the lower social security contributions and the additional burden will come from higher energy costs, which on the other hand represent an incentive to increase energy efficiency. This 'greening' of the industry will partly also be reached via carbon leakage to regions without climate policies.

The model of fiscal environmental devaluation consists of balancing lower social security revenues by an 'environmental VAT'. This is a consumption tax on embodied resource use corresponding to the same per unit taxation of resource use (e.g. 200 €/t CO₂) in production. This tax reform model is inspired by the discussion on fiscal devaluation (Farhi et al., 2011, de Mooij and Keen, 2012, as well as CPB/CAPP, 2013) and includes an environmental element in it. In this model GDP will be increased and the price competitiveness of the industry is enhanced by lower output prices, but no incentive for 'greening' production is at work. Consumption is taxed and therefore the same shift in the burden from exporters towards consumers occurs as in the case of currency devaluation or fiscal devaluation with VAT. Levying a tax on the consumption of energy intensive goods independently of the origin will also reduce energy use and CO₂ emissions outside Europe, as final demand for these products decreases.

The DYNK model shall be used to carefully evaluate the different impacts of these two tax reform concepts.

Labour market policy

Given the general high unemployment rates in Europe in the aftermath of the crisis and the heterogeneity across EU member states with unemployment rates above 20% in some peripheral countries like Spain, labour market policy is a short and long-term priority of

European economic policy. The starting point is the expectation that a significant reduction of unemployment rates of above 20% without specific measures aiming at the important labour market issues might take a long time. A concept of socially inclusive growth should integrate active labour market policy as a key element. Research in the project (Area 4) has shown that improving the functioning of the labour market (hiring and firing rates, matching efficiency) has a productivity effect and therefore a positive impact on GDP (Busl and Seymen, 2013). Faia et al. (2012) additionally find out that the output multiplier of labour market policies after a crisis is higher than the output multiplier of 'traditional' fiscal policy.

The DYNK model will be used to evaluate the macroeconomic impact of two different aspects of labour market policy: (i) increases in the matching efficiency via new models of job service institutions, and (ii) short-time work, oriented along the lines of the German "Kurzarbeit". Busl and Seymen (2013) have already shown within a calibrated DSGE model how increased matching efficiency lowers equilibrium unemployment. We will incorporate a similar simulation in the DYNK model, where improved matching efficiency leads to wage depression and therefore higher employment demand and hires. As outlined in the first section, wages and hours of work are simultaneously bargained in the DYNK model and shortening of hours per worker will have wage repercussions. This mechanism in the model can be complemented by elements of the German "Kurzarbeit" model where the income loss of work time reduction is partly compensated for by subsidies. In the case of Germany this is financed out of an employers' fund, in the case of a country that introduces this model it had to be public financing and in the long term be financed out of employers' contributions, i.e. higher wage costs.

Industrial policy and innovation

These are long-term issues of transition and growth and shall be incorporated into policy simulations via a new direction of research funding towards environmentally friendly innovation (results of WP303). Main drivers for the new growth path are innovation fostering directed technical change, given the social and ecological objectives defining this new path. That includes the analysis of policy design as well as the analysis of the economic and social impact of new policies, by applying the DYNK model.

In a first step, different types of innovation (product, process, organizational and social innovation) shall be incorporated into the DYNK model (in parallel to the incorporation into the CGE model PACE in WP303). Then, the enriched model shall be used for simulations of the economic impact of environmentally friendly innovation.

References

1. The mission of WWWforEurope - First signals for transition and recent rebounds:

- Aiginger, K. (2010 A), "Post crisis policy: Some reflections of a Keynesian economist", in: Dullien, S., Hein, E., Truger, A., Treeck, T. (eds.), *The World Economy in Crisis - The Return of Keynesianism?* Series of the Research Network Macroeconomics and Macroeconomic Policies (FMM), Vol. 13, Metropolis, 2010.
- Aiginger, K. (2010 B), "The Great Recession vs. the Great Depression: Stylized Facts on Siblings That Were Given Different Foster Parents", *Economics*, Vol. 4, 2010-18.
- Aiginger, K., Bärenthaler-Sieber, S., Vogel, J., *Competitiveness under New Perspectives*, WWWforEurope Working Paper no 44, October 2013.
- Aiginger, K., Guger, A., Stylized facts on the interaction between income distribution and the great recession, *Economics Discussion Papers*, No 2013-25, Kiel Institute for the World Economy, 2013.
- Aiginger, K., Firgo, M., Huber, P., Policy options for the development of peripheral regions and countries of Europe, WWWforEurope Policy Brief Issue 2, December 2012.
- Aiginger, K., Cramme, O., Ederer, S., Liddle, R., Thillaye, R., Reconciling the short and the long run: governance reforms to solve the crisis and beyond, WWWforEurope Policy Brief Issue 1, September 2012.
- Aiginger, K., Horvath, Th., Mahringer, H., Why Labor Market Response Differed in the Great Recession: The Impact of Institutions and Policy, *DANUBE: Law and Economics Review* 3/2012.
- European Commission: Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth, Com (2014), 130 final.
- EEA Report, Towards a green economy in Europe, 8/2013.
- Eichengreen, B., O'Rourke, K. (2009). *A Tale of Two Depressions*, Eichengreen, O'Rourke, 2009.
- European Commission, An Integrated Industrial Policy for the Globalisation Era Putting Competitiveness and Sustainability at Centre Stage, Brussels, COM(2010), 614. European Commission, Energy Economic Developments in Europe, *European Economy* 1, 2014.
- Fischer-Kowalski, M., Wiedenhofer, D., Haas, W., Pallua, I., Hausknost, D., Developing Resource use Scenarios for Europe, WWWforEurope Working Papers, Issue 25, July 2013.
- Munoz P., Steininger K.W. Austria's CO2 responsibility and the carbon content of its international trade, *Ecological Economics* 69 (2010), pp 2003-19.
- Tichy, G., Bestimmungsgründe der Wettbewerbsfähigkeit, *WIFO-Monatsberichte* 12/2013, 12/2013, p. 993-998.
- Tichy, G., Die Staatsschuldenkrise als Krise des europäischen Finanzsystems, *WIFO-Monatsberichte* 6/2013, p. 473-492.
- Zachmann, G., Cipollone, V., "Energy competitiveness", in: Veugelers, R., (editor), *Manufacturing Europe's future*, Bruegel Blueprint Series, XXI, 2013.

2.1 Summary of Area 1:

- Crespo Cuaresma, Jesus, Mathias Moser and Anna Raggl (2013): On the Determinants of Global Bilateral Migration Flows. WWWforEurope Working Paper No. 5.
- Crespo Cuaresma, Jesus, Samir K.C. and Petra Sauer (2013): Age-Specific Education Inequality, Education Mobility and Income Growth. WWWforEurope Working Paper No. 6.
- Hammer, Bernhard, Alexia Prskawetz and Inga Freund (2013): Reallocation of Resources Across Age in a Comparative European Setting. WWWforEurope Working Paper No. 13.

- Heinemann, Friedrich and Theocharis Grigoriadis (2013): Origins of Reform Resistance and the Southern European Regime. WWWforEurope Working Paper No. 20.
- Huber, Peter and Doris A. Oberdabernig (2013): Does migration threaten the sustainability of European welfare states? WWWforEurope Working Paper No. 21.
- Kopasker, Daniel, Holger Görg, Hassan Molana and Catia Montagna (2013): Negative Shocks, Job Creation, and Selection. WWWforEurope Working Paper No. 11.
- Lechthaler, Wolfgang and Mariya Mileva (2013): Two-Country Dynamic Model of Trade with Heterogeneous Firms and Comparative Advantage. WWWforEurope Working Paper No. 12.
- Leoni, Thomas and Rainer Eppel (2013): Women's Work and Family Profiles over the Lifecourse and their Subsequent Health Outcomes. Evidence for Europe. WWWforEurope Working Paper No. 28.
- Orosz, Ágnes (2013): Large-Scale Transformation of Socio-Economic Institutions - Comparative Case Studies on CEECs. Background Paper 2: Comparative Country Study – Hungary. WWWforEurope Working Paper No. 18.
- Pitlik, Hans and Ludek Kouba (2013): The interrelation of informal institutions and governance quality in shaping Welfare State attitudes, WWWforEurope Working Paper No. 38.
- Schweickert, Rainer, Markus Ahlborn, Karol Frank, Ágnes Orosz, Ivana Sikulová and Miklós Szanyi (2013): Large-Scale Transformation of Socio-Economic Institutions - Comparative Case Studies on CEECs. Interim Report. WWWforEurope Working Paper No. 16.
- Sikulová, Ivana and Karol Frank (2013): Large-Scale Transformation of Socio-Economic Institutions - Comparative Case Studies on CEECs. Background Paper 1: Comparative Country Study – Slovakia. WWWforEurope Working Paper No. 17.
- Szanyi, Miklós (2013): Large-Scale Transformation of Socio-Economic Institutions - Comparative Case Studies on CEECs. Background Paper 3: Varieties of Capitalism and CEECs. WWWforEurope Working Paper No. 19.

2.2 Summary of Area 2:

- Kettner, C., A. Köppl and S. Stagl (2012). List of well-being indicators suitable for inclusion in socio-ecologically extended macroeconomic models, MS30, WWWforEurope, Vienna.
- Gazheli, A., M. Antal and J.C.J.M. van den Bergh (2012). Behavioral foundations of sustainability transitions, MS31, WWWforEurope, Vienna.
- Gazheli, A., M. Antal and J.C.J.M. van den Bergh (2013). Policy responses by different agents/stakeholders in a transition: Integrating the Multi-level Perspective and behavioral economics, MS33, WWWforEurope, Vienna.
- Fischer-Kowalski, M., D. Wiedenhofer, W. Haas, I. Pallua and D. Hausknost (2013). Developing resource use scenarios for Europe, Working Paper no 025, MS35, WWWforEurope, Vienna.
- van den Bergh, J.C.J.M. (2013). Policies to enhance economic feasibility of a sustainable energy transition. PNAS 110(7): 2436-2437.

2.3 Contribution of Area 3:

- Karl Aiginger, Susanne Sieber and Johanna Vogel, Competitiveness under New Perspectives, WWWforEurope Working Paper Series, Issue 44, October 2013.
- Christian Ketels and Sergiy Protsiv, [Clusters and the New Growth Path for Europe](#), WWWforEurope Working Paper Series, Issue 14, July 2013
- Georg Licht and Bettina Peters, The Impact of Green Innovation on Employment Growth in Europe, WWWforEurope Working Paper Series, Issue 50, December 2013.
- Georg Licht and Bettina Peters, Specific analysis of the eco-innovation-employment growth-link for Germany, WWWforEurope Working Paper Series, forthcoming.

- Birgit Aschhoff, Georg Licht and Paula Schliessler, Who drives smart growth? The contribution of small and young firms to inventions in sustainable technologies, WWWforEurope Working Paper Series, Issue 47, November 2013.
- Martin Falk, [New empirical findings for international investment in intangible assets](#), WWWforEurope Working Paper Series, Issue 30, July 2013.
- Christian Grabas and Alexander Nützenadel, [Industrial Policies in Europe in Historical Perspective](#), WWWforEurope Working Paper Series, Issue 15, July 2013.
- Klaus Friesenbichler, [Innovation in the energy sector](#), WWWforEurope Working Paper Series, Issue 31, July 2013.
- David Bailey and Philip Amison, Industrial diversity and innovation spillovers: dynamic innovation and adoption, WWWforEurope Working Paper Series, Issue 45, November 2013.
- Andreas Reinstaller, An evolutionary view on social innovation and the process of economic change, WWWforEurope Working Paper Series, Issue 43, October 2013.
- Jürgen Janger and Klaus Nowotny, [Career choices in academia](#), WWWforEurope Working Paper Series, Issue 36, August 2013.
- Jürgen Janger, Anna Strauss and David Campbell, [Academic careers: a cross-country perspective](#), WWWforEurope Working Paper Series, Issue 37, August 2013.
- Lisa De Propriis and Carlo Corradini, [Technology Platforms in Europe: an empirical investigation](#), WWWforEurope Working Paper Series, Issue 34, July 2013.

2.4 Contribution of Area 4:

- Aiginger, K., Cramme, O., Ederer, S., Liddle, R. and Thillaye, R. (2012): Reconciling the short and the long run: governance reforms to solve the crisis and beyond, WWW Policy brief Issue 1.
- Aiginger, K., S. Bärentaler-Sieber, J. Vogel (2013): Competitiveness under new perspectives, WWW Working Paper Issue 44.
- Busl, C. and Kappler, M. (2013): Does Foreign Direct Investment Synchronise Business Cycles? Results from a Panel Approach, WWW Working Paper Issue 23.
- Busl, C. and Seymen, A. (2013): (Spillover) Effects of Labour Market Reforms in Germany and France, WWW Working Paper Issue 8.
- Rozmahel, R., Kouba, L., Grochová, L. and Najman, N. (2013): Integration of Central and Eastern European Countries: Increasing EU Heterogeneity? WWW Working Paper Issue 9.
- Sachs, A. and Schleer, F. (2013): Labour market performance in OECD countries: A comprehensive empirical modelling approach of institutional interdependencies, WWW Working Paper Issue 7.
- Thillaye, R. (2013a): The challenges of EU governance and the quest for long-term growth, WWW Working Paper Issue 4.
- Thillaye, R. (2013b): Coordination in place of integration? Economic governance in a non-federal EU, WWW Working Paper Issue 32.
- Van Aarle, Bas (2013): Surveillance and Control of Fiscal Consolidation on a Supranational Level, mimeo.

2.5 Summary of Area 5:

- Aiginger K. (2012) A new strategy for the European periphery, WWWforEurope Policy Paper No 1, http://www.foreurope.eu/fileadmin/documents/pdf/PolicyPapers/WWWforEurope_Policy_Paper_001.pdf.
- Aiginger K., Firgo M., Huber P. (2012) Policy options for the development of peripheral regions and countries of Europe, WWWforEurope Policy brief No 2, http://www.foreurope.eu/fileadmin/documents/pdf/Policybriefs/WWWforEurope_PB_no02_D504.1.pdf.

- Aiginger K., Firgo M., Huber P. (2013) Policy lessons from regional growth experiences for the restructuring of peripheral countries in EMU, manuscript.
- Aiginger K., Firgo M., Huber P. (2013a), Erfolgsstrategien für die europäische Peripherie. Erkenntnisse für Südeuropa aus der Regionalökonomie, WIFO-Monatsberichte 6/2013, pp. 509-521.
- Alesina, Alberto, and LaFerrara, Eliana (2005), Ethnic Diversity and Economic Performance, *Journal of Economic Literature*, 43(3), 762-800.
- Audretsch, D., Dohse, D., and Niebuhr, A. (2010), Cultural Diversity and Entrepreneurship. A Regional Analysis for Germany, *Annals of Regional Science*, 45, 55-85.
- Camaioni B., Esposti R. Lobianco A., Pagliacci F., Sotte F. (2013) Looking for Peripherality, WWWforEurope Working Paper No 35 http://www.foreurope.eu/fileadmin/documents/pdf/Workingpapers/WWWforEurope_WPS_no035_MS104.pdf.
- Dohse D., Gold R (2013) Measuring Cultural Diversity at a Regional Level WWWforEurope Working Paper No 10, http://www.foreurope.eu/fileadmin/documents/pdf/Workingpapers/WWWforEurope_WPS_no022_MS99.pdf.
- Easterly, W., Levine, R. (1997), Africa's Growth Tragedy. Policies and Ethnic Divisions, *Quarterly Journal of Economics*, 112(4), 1203-1250.
- Fearon, J. D. (2003), Ethnic and Cultural Diversity by Country, *Journal of Economic Growth*, 8, 195-222.
- Franz, Hans-Werner, Hochgerner, Josef, Howaldt, Jürgen (2012), Challenge Social Innovation: an introduction. In Franz, Hans-Werner, Hochgerner, Josef, Howaldt, Jürgen, eds., *Challenge Social Innovation: Potentials for Business, Social Entrepreneurship, Welfare and Civil Society*, Springer London.
- Firgo M., Huber P. (2013) Unconditional Convergence in Currency Unions: An analysis of European regions from 1991 to 2009, WWWforEurope Policy Paper No 4, http://www.foreurope.eu/fileadmin/documents/pdf/PolicyPapers/WWWforEurope_Policy_Paper_004.pdf.
- Huber P. (2013) Labour Market Institutions and Regional Unemployment Disparities WWWforEurope Working Paper No 29, http://www.foreurope.eu/fileadmin/documents/pdf/Workingpapers/WWWforEurope_WPS_no029_MS95.pdf.
- Horvath T., Huber P. (2013) The impact of networks, segregation and diversity on migrants' labour market integration, WWWforEurope Working Paper No 22, http://www.foreurope.eu/fileadmin/documents/pdf/Workingpapers/WWWforEurope_WPS_no022_MS100.pdf.
- Labaye A., Sauer T. (2013) City networks and the socio-ecological transition. A European inventory, WWWforEurope Working Paper No 29, http://www.foreurope.eu/fileadmin/documents/pdf/Workingpapers/WWWforEurope_WPS_no027_MS89.pdf.
- OECD (2006), *The New Rural Paradigm. Policies and Governance*, Paris: OECD.
- OECD (2009) *How Regions Grow: Trends and Analysis*, Paris: OECD.
- Ottaviano, Gianmarco I.P. and Peri, Giovanni (2006), The Economic Value of Cultural Diversity. Evidence from US Cities, *Journal of Economic Geography*, 6, 9-44.
- Rotmans, Jan; Loorbach, Derk (2008): Transition management. Reflexive governance of societal complexity through searching, learning and experimenting. In Jeroen C. J. M. den van Bergh, Frank R. Bruinsma (Eds.): *Managing the transition to renewable energy. Theory and practice from local, regional and macro perspectives*. Cheltenham: Elgar.
- World Bank (2009), *World Development Report 2009*, Washington D.C., The International Bank for Reconstruction and Development / The World Bank.

4.1 Understanding socio-technical sustainability transitions and policy implications:

- Aanesen, K., Heck, S. and Pinner, D., 2012. *Solar power: darkest before dawn*. McKinsey on Sustainability and Resource Productivity report.
- Barrett, J., Peters, G., Wiedmann, T., Scott, K., Lenzen, M., Roelich, K. and le Queré, C., 2013, Consumption-based GHG emission accounting: A UK case study, *Climate Policy*, 13(4), 451-470
- Berners-Lee, M. and Clark, D., 2013, *The Burning Question. We can't burn half the world's oil, coal and gas. So how do we quit?* Profile Books, London
- Bijker, W.E., Hughes T.P. and Pinch, T. (eds.), 1987, *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, Cambridge, Massachusetts: The MIT Press
- Bonardi, J. and Keim, G., 2005, 'Corporate political strategy for widely salient issues', *Academy of Management Review*, 30(3), 555-576
- Bowen, A. and Fankhauser, S., 2011, 'The green growth narrative: Paradigm shift or just spin?', *Global Environmental Change*, 21, 1157-1159
- Burnstein, P., 2003, 'The impact of public opinion on public policy: A review and an agenda', *Political Research Quarterly*, 56, 29-40
- Clark, J., Freeman, C. and Soete, L., 1981, 'Long waves, inventions and innovations', *Futures*, 13, 308-322
- De Bruijn, J.A., W.J.M. Kickert & J.F.M. Koppenjan (1993), 'Hoofdstuk 1: Inleiding: Beleidsnetwerken en overheidssturing' ('chapter 1: introduction: policy networks and governance'), in: J.F.M. Koppenjan, J.A. de Bruijn & W.J.M. Kickert (red.), *Netwerkmanagement in het openbaar bestuur* ('Network governance in public policy'), Den Haag: Vuga, 11-30
- DiMaggio, P.J., and Powell, W.W., 1983, 'The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields', *American Sociological Review*, 48(2), 147-160
- Dosi, G. (1982), 'Technological paradigms and technological trajectories: A suggested interpretation of the determinants and directions of technical change', *Research Policy*, 6(3), 147-162.
- Fankhauser, A., Bowen, A., Calel, R., Dechezleprêtre, A., Grover, D., Rydge, J., Sato, M., 2013, [Who will win the green race? In search of environmental competitiveness and innovation](#), *Global Environmental Change*, 23(5), 902-913
- Frankfurt School of Finance and Management gGmbH, 2013, *Global Trends in Renewable Energy Investment 2013: Key findings* (in collaboration with Bloomberg New Energy Finance)
- Freeman, C. and C. Perez (1988), 'Structural crisis of adjustment, business cycles and investment behaviour', in: G. Dosi, C. Freeman, R. Nelson, G. Silverberg & L. Soete (eds.), *Technical Change and Economic Theory*, London: Pinter, 38-66
- Geels, F.W. (2002), 'Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study', *Research Policy*, 31(8-9), 1257-1274
- Geels, F.W., 2004, 'From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory', *Research Policy*, 33(6-7), 897-920
- Geels, F.W., 2005, 'The dynamics of transitions in socio-technical systems: A multi-level analysis of the transition pathway from horse-drawn carriages to automobiles (1860-1930),' *Technology Analysis & Strategic Management*, 17(4), 445-476
- Geels, F.W. and R.P.J.M. Raven, 2006, 'Non-linearity and expectations in niche-development trajectories: Ups and downs in Dutch biogas development (1973-2003)', *Technology Analysis & Strategic Management*, 18(3/4), 375-392
- Geels, F.W., 2014, 'Regime resistance against low-carbon energy transitions: Introducing politics and power in the multi-level perspective', *Theory, Culture & Society*; accepted and forthcoming
- Giddens, A. (1984), *The Constitution of Society: Outline of the Theory of Structuration*, Berkeley [etc.]: University of California press

- Giddens, A., 2009, *The Politics of Climate Change*, Polity Press, Cambridge, UK
- Helm, D., 2011. The sustainable borders of the state. *Oxford Review of Economic Policy* 26(2), 182-196.
- Hoogma, R., R. Kemp, J. Schot, and B. Truffer (2002), *Experimenting for Sustainable Transport: The Approach of Strategic Niche Management*, London and New York: Spon Press
- Hughes, T.P., 2004, *The Human-Built World: How to Think about Technology and Culture*, Chicago and London: The University of Chicago Press
- International Energy Agency, 2011, *World Energy Outlook*, Paris, France
- International Energy Agency (2013) *Redrawing the Energy Climate Map, World Energy Outlook Special Report*. Paris, France.
- Kemp, R, J. Schot and R. Hoogma (1998), 'Regime shifts to sustainability through processes of niche formation: The approach of strategic niche management', *Technology Analysis and Strategic Management*, 10(2), 175-196
- Levinthal, D.A. (1998), 'The slow pace of rapid technological change: Gradualism and punctation in technological change', *Industrial and Corporate Change*, 7(2), 217-247
- Levy, D.L. and Egan, D., (2003), 'A neo-Gramscian approach to corporate political strategy: Conflict and accommodation in the climate change negotiations', *Journal of Management Studies*, 40(4), 803-30
- Mackenzie, D. and J. Wajcman (eds.) (1985), *The Social Shaping of Technology. How the Refrigerator Got its Hum*, Milton Keynes: Open University Press
- Mokyr, J. (1990), *The Lever of Riches: Technological Creativity and Economic Progress*, New York: Oxford University Press
- Nelson, R.R. and S.G. Winter (1982), *An Evolutionary Theory of Economic Change*, Cambridge (Mass.): Belknap Press
- Nykvist, B. and Whitmarsh, L., 2008, 'A multi-level analysis of sustainable mobility transitions: Niche developments in the UK and Sweden', *Technological Forecasting and Social Change*, 75(9), 1373-1387
- Pearson, P.J.G. and Foxon, T.,J. 2012, 'A low carbon industrial revolution? Insights and challenges from past technological and economic transformations', *Energy Policy*, 50, 117-127
- Penna, C.C.R. and Geels, F.W., 2013, 'Climate change and the slow reorientation of the American car industry (1979-2018): An application and extension of the Dialectic Issue LifeCycle (DILC) model', *Research Policy*, under review
- REN-21, 2013, *Renewables 2013: Global Status Report*, Paris, Renewable Energy Policy Network for the 21st Century
- Rip, A. and R. Kemp (1998), 'Technological change', in: S. Rayner and E.L. Malone (eds), *Human Choice and Climate Change*, Columbus, Ohio: Battelle Press. Volume 2, pp. 327-399
- Schot, J.W., 2003, 'The contested rise of a modernist technology politics', in: Misa, T.J., Brey, P. and Feenberg, A. (eds.), *Modernity and Technology*, The MIT Press, Cambridge, Massachusetts, and London, England, pp. 257-278
- Scott, W.R. (2001), *Institutions and Organizations*, second edition, Thousand Oaks, CA: Sage publications
- Smith, A. and Stirling, A., 2007, 'Moving outside or inside? Objectification and reflexivity in the governance of socio-technical systems', *Journal of Environment and Planning*, 9(3-4), 351-373
- Turnheim, B., 2012, *The destabilisation of existing regimes in socio-technical transitions: Theoretical explorations and in-depth case studies of the British coal industry (1913-2010)*, PhD thesis, SPRU, University of Sussex
- Urry, J., 2010, 'Sociology facing climate change' *Sociological Research Online*, 15(3): 1
- Van Driel, H. and Schot, J., 2005, 'Radical innovation as a multi-level process: Introducing floating grain elevators in the port of Rotterdam', *Technology and Culture*, 46(1), 51-76

- Veugelers, R., 2012, [Which policy instruments to induce clean innovating?](#), *Research Policy*, 41(10), 1770-1778
- Walker, W., 2000, 'Entrapment in large technology systems: Institutional commitments and power relations', *Research Policy*, 29(7-8), 833-846
- Walker, G.P. and Devine-Wright, P., 2008, 'Community renewable energy: What should it mean?', *Energy Policy*, 36, 497-500
- Weterings, R., J. Kuijper, E. Smeets, G.J. Annokkée & B. Minne (1997), *81 mogelijkheden Technologie voor duurzame ontwikkeling. Eindrapport van de milieugerichte technologieverkenning* ('81 possibilities: technology for sustainable development; final report of the environmental technology foresight exercise'), TNO-STB, TNO-MEP, CPB in opdracht van VROM.
- Zenghelis, D., 2012, *A Strategy for Restoring Confidence and Economic Growth through Green Investment and Innovation*, Policy Brief, Grantham Institute, London School of Economics

4.2 Gender regimes and gender policies in Europe - Searching for welfare, work and gender equality:

- Akgündüz, Y.E. and Plantenga, J. (2011). Labour market effects of parental leave, a European perspective, *Cambridge Journal of Economics*, 37, 845–862.
- Barr, N. (2002). *The welfare state as Piggy Bank. Information, Risk, Uncertainty and the role of the state*. Oxford: Oxford University Press.
- Bennett, J. and Tayler, C. P. (2006). *Starting strong II: Early childhood education and care*. Paris: OECD.
- Bettio, F. and Plantenga, J. (2004). Comparing care regimes in Europe, *Feminist Economics*, 10(1): 85–113.
- Bettio, F., Simonazzi, A. and Villa, P. (2006). Change in care regimes and female migration: the 'care drain' in the Mediterranean, *Journal of European Social Policy*, 16(3): 271-85.
- Bettio, F. and Verashchagina, A. (2013). Current tax-benefit systems in Europe are they fair to working women. In: F. Bettio, J. Plantenga and M. Smith (eds.). *Gender and the European Labour Market*. Abingdon/Oxon: Routledge.
- Bielinski, H., Bosch, G. and Wagner, A. (2002). *Working time preferences in sixteen European countries*. Luxembourg: Office for Official Publications of the European Communities.
- Blau, D. M. (2001). *The child care problem: An economic analysis*. New York: Russell Sage Foundation.
- Blau, D.M. and Currie, J. (2006). Pre-school, day care, and after-school care: who's minding the kids? In: Hanushek, E.A., Welch, F. (Eds.), *Handbook of the Economics of Education*, Vol.2. Elsevier, pp. 1163–1278.
- Bonoli, G. (2005). [The politics of the new social policies: providing coverage against new social risks in mature welfare states](#), *Policy & Politics*, 33(3): 431-449.
- Bosch, G. (1999). Working time: tendencies and emerging issues. *International Labour Review* 138(2): 131–149.
- Bosch, G., Dawkins, P. and Michon, F. (1994). *Times are changing. Working time in 14 industrialised countries*. Geneva: International Institute for Labour Studies - International Labour Organization (ILO).
- Bruning, G. and Plantenga, J. (1999). Parental leave and equal opportunities. Experiences in eight European countries, *Journal of European Social Policy*, 9(3): 195-209.
- Carone, G., Immervoll, H., Paturot, D., and Salomäki, A. (2004). Indicators of Unemployment and Low-Wage Traps: Marginal Effective Tax Rates on Employment Incomes. OECD Social, Employment and Migration Working Papers N°18, OECD Publishing.
- CEU (Council of the European Union) (1992). Council recommendation of 31 March 1992 on childcare (92/241/EEC), *Official Journal of the European Union*, 08–05–1992: L 123, 0016–0018.

- CEU (Council of the European Union) (1998). Council Directive 97/81/EC of 15 December 1997 concerning the Framework agreement on part-time work concluded by UNICE, CEEP and the ETUC, *Official Journal of European Union*, 20-01-1998: L 14/9-L 14/14.
- CEU (Council of the European Union) (2010). Council Directive 2010/18/EU of 8 March 2010 implementing the revised Framework Agreement on parental leave concluded by Business Europe, UEAPME, CEEP and ETUC and repealing Directive 96/34/EC, *Official Journal of the European Union*, 18-03-2010: L68/13-L68/20.
- Costa, D. L. (2000). The Wage and the Length of the Work Day: From the 1890s to 1991, *Journal of Labor Economics*, 18 (1): 156-181.
- Daly, M. (2011). What Adult Worker Model? A critical look at recent social policy reform in Europe from a gender and family perspective. *Social Politics*, 18 (1): 1-23.
- Del Boca, D. Pasquay, S. and Pronzatoz, C. (2009). Motherhood and market work decisions in institutional context: a European perspective. *Oxford Economic Papers*, 61, i147-i171.
- Ellingsaeter, A. L. (2012). Cash for Childcare. Experiences from Finland, Norway and Sweden. *Friedrich Ebert Stiftung, International Policy Analysis*. Retrieved from <http://library.fes.de/pdf-files/id/09079.pdf>
- European Commission (EC) (2010). *Strategy for equality between women and men 2010-2015*, Brussels: European Commission.
- European Commission (2013). Tax and Benefit Indicators. Retrieved from http://ec.europa.eu/economy_finance/db_indicators/tab/
- European Communities (EC) (1985). The EC Commission on Income Taxation and Equal Treatment for Men and Women, 'Memorandum of 14 December 1984 presented to the EC Council. *Bulletin of the International Bureau of Fiscal Documentation*, 39 (June): 262-66.
- Evertsson, M. and Duvander, A.Z. (2011). Parental leave – possibility or trap? Does family leave length effect Swedish women's labour market opportunities?, *European Sociological Review*, 27(4): 435-50.
- Fagan, C. and Hebson, G. (2006). 'Making work pay' debates from a gender perspective: a comparative review of some recent policy reforms in thirty European countries, Luxembourg: Office for Official Publications of the European Communities.
- Gauthier, A. H. (2002). Family policies in industrialized countries: is there convergence. *Population*, 57(2): 447-474.
- Gauthier, A. H. (2007). The impact of family policies on fertility in industrialized countries: a review of the literature. *Population Research and Policy Review*, 26(3): 323-346.
- Gauthier, A. (2014). Database. In *Comparative Family Policy Database*. Retrieved on 11-02-2014, from http://www.demogr.mpg.de/cgi-bin/databases/FamPoIDB/index_data.plx.
- Goldin, C. (2006). The quiet revolution that transformed women employment, education and family (Richard T. Ely Lecture). *American Economic Association, Papers and Proceedings*.
- Gornick, J. and Meyers, M.K. (2003). *Families that Work: Policies for Reconciling Parenthood and Employment*, New York: Russell Sage Foundation Publications.
- Hegewisch, A. and Gornick, J. (2011). The impact of work-family policies on women's employment: a review of research from OECD countries, *Community, Work and Family*, 14(2): 119-38.
- Heineman, E. (2013). The debate over Betreuungsgeld. *The American Institute for Contemporary German Studies*. Retrieved on 13-09-2013 from: <http://www.aicgs.org/publication/the-debate-over-betreuungsgeld/4/>.
- ILO (2014). NATLEX . Retrieved on 11-02-2014 from http://www.ilo.org/dyn/natlex/natlex_browse.home
- Janssens, A.(ed.) (1998). *The Rise and Decline of the Male Breadwinner Family?* Cambridge: Cambridge University Press.
- Jaumotte, F. (2003). *Female labour force participation: past trends and main determinants in OECD countries*, Paris: OECD.

- Kammerman, S. B. (2006). A global history of early childhood education and care. Background paper for the Education for all global monitoring report 2007: strong foundations: early childhood care and education. <http://unesdoc.unesco.org/images/0014/001474/147470e.pdf>
- Kammerman, S.B and Moss, P. (eds) (2009), *The Politics of Parental Leave Policies. Children, Parenting, Gender and the Labour Market*. Bristol: Policy Press
- Klerman J, Leibowitz (1997). Labor supply effects of state maternity leave legislation. In: Blau F, Ehrenberg R. (eds). *Gender and Family Issues in the Workplace*. New York: Russell Sage. pp. 65–85.
- Korpi, W., Ferrarini, T., & Englund, S. (2013). Women's Opportunities under Different Family Policy Constellations: Gender, Class, and Inequality Tradeoffs in Western Countries Re-examined, *Social Politics: International Studies in Gender, State & Society*, 20(1): 1-40.
- Lalive, R., and Zweimüller, J. (2009). How does parental leave affect fertility and return to work? Evidence from two natural experiments, *The Quarterly Journal of Economics*, 124(3): 1363-1402.
- Land, H. (1980). The Family Wage. *Feminist Review* 6: 55-77.
- Leitner, S. (2003). Varieties of familialism. The caring function of the family in comparative perspective, *European Societies*, 5(4): 353-375.
- Letablier, M.- T. (2003). Fertility and family policies in France, *Journal of Population and Social Security*, 1(1), 242-258.
- Letablier, M.-T. (2005). Challenges and opportunities faced by European welfare states: the changing context for child welfare. Paper presented at the Wellchi Network Conference, January 7-8, University of Oxford.
- Lewis, J. (1992). Gender and the Development of Welfare Regimes. *Journal of European Social Policy* 2, no. 3: 159-73.
- Lewis, J. (2001). The decline of the male breadwinner model. Implications for work and care, *Social Politics*, 8(2): 152-170.
- Lewis, J., and Giullari, S. (2005). The adult worker model family, gender equality and care: The search for new policy principles and the possibilities and problems of a capabilities approach, *Economy and Society*, 34(1): 76-104.
- Mandel, H. and Semyonov, M. (2006). A Welfare State Paradox: State Interventions and Women Employment Opportunities in 22 Countries. *American Journal of Sociology*, 111(6): 1910-49.
- Mandel, H. and Shalev, M. (2009). How welfare state shape the gender pay gap. A theoretical and comparative analysis, *Social Forces*, 87: 1873-1912.
- McCaffery, E.J. (2008). Where's the Sex in Fiscal Sociology? Taxation and Gender in Comparative Perspective. University of Southern California Law School, *Law and Economics Working Paper Series*, no. 70.
- Merens, A. (2008). Vijftig jaar deeltijdwerk in Nederland: ontstaan en ontwikkeling van deeltijdbanen'. In: W. Portegijs et al. (ed.). *De Verdeelde tijd. Waarom vrouwen in deeltijd werken*. Den Haag: Sociaal en Cultureel Planbureau.
- Messenger, J. C. (2010). Working time trends and developments in Europe. *Cambridge Journal of Economics*, 35 (2) : 295–316.
- Meulders, D and O'Dorchai, S. (2007). The position of mothers in a comparative welfare state perspective. In : D. Del Boca and C. Wetzels (eds.). *Social politics, labour markets and motherhood*. Cambridge: Cambridge University Press.
- Moss, P. (2012). International review of leave policies and related research 2012.
- Moss, P. (2013). Archive (2005-2012). In *Leave Network*. Retrieved on 11-02-2014, from http://www.leavenetwork.org/archive_2005_2012/?S=kontrast%3F%3F.
- Nasar. S. (2011). *Grand Pursuit: the Story of Economic Genius: New York City : Simon and Schuster*

- Nelson, J. (1996). Feminist theory and the income tax, in *Feminism, Objectivity, and Economics*. New York: Routledge.
- Neyer, G. (2003). Family policies and low fertility in Western Europe, *Journal of Population and Social Security (Population)*, 1, 46-93.
- Pauls, K. (March 29, 2013). German childcare allowance raises questions about working moms. *CBC News*. Retrieved on 13-09-2013 from: <http://www.cbc.ca/news/world/story/2013/03/26/pauls-berlin-childcare.html>
- OECD (Organization for Economic Cooperation and Development (2007). *Babies and Bosses*, Paris: OECD.
- OECD (2014). *Family Database*. Retrieved on 11-02-2014 from <http://www.oecd.org/els/soc/oecdfamilydatabase.htm>
- Pascall, G., & Lewis, J. (2004). Emerging gender regimes and policies for gender equality in a wider Europe, *Journal of Social Policy*, 33(3): 373-394.
- Plantenga, J. (1993). Een afwijkend patroon. Honderd jaar vrouwenarbeid in Nederland en (West-)Duitsland. SUA: Amsterdam
- Plantenga, J. (2004). Changing work and life patterns. Examples of new working time arrangements in the European member states. In: J. Giele and E. Holst (ed.), *Changing Life Patterns in Western Industrial Societies (Advances in life course research, Volume 8)*. London: Elsevier Ltd, pp.119-135.
- Plantenga, J. and Remery C. (2005). *Reconciliation of Work and Private Life: A Comparative Review of Thirty European Countries*, Luxembourg: Office for Official Publications of the European Communities.
- Plantenga, J. and Remery C. (2009). *The Provision of Childcare Services: A Comparative Review of Thirty European Countries*, Luxembourg: Office for Official Publications of the European Communities.
- Plantenga, J. and Remery C. (2010). *Flexible Working Time Arrangements and Gender Equality: A Comparative Review of Thirty Countries*, Luxembourg: Office of Official Publications of the European Union.
- Ray, R., Gornick, J. and Schmitt, J. (2010). Who cares? Assessing generosity and gender equality in parental leave policy designs in 21 countries, *Journal of European Social Policy*, 20(3): 196–216.
- Ruhm, Christopher (1998). The economic consequences of parental leave mandates: lessons from Europe, *Quarterly Journal of Economics*, 113(1): 285–317.
- Ruhm, C. (2000). Parental leave and child health, *Journal of Health Economics*, 19(6): 931-960
- Rubery, J. Smith, M and Fagan, C (1998). National working time regimes and equal opportunities, *Feminist Economics*, 4(1): 71-101
- Stiglitz, Joseph, Amartya Sen and Jean-Paul Fitoussi (2009). Report by the Commission on the Measurement of Economic Performance and Social Progress, available at: www.stiglitz-sen-fitoussi.fr
- Stotsky, J.G. (1997). How Tax Systems Treat Men and Women Differently, *Finance & Development* March, 30-3.
- Thévenon, O. (2011). Family Policies in OECD Countries: A comparative Analysis, *Population and Development Review*, 37(11): 57-87.
- Thévenon, O. (2013). Drivers of female labour force participation in the OECD (No. 145). OECD Publishing.
- Tresch, R.W. (2008). *Public Sector Economics*. Hampshire: Palgrave Macmillan
- Women, Business and the Law (2014). *Data*. Retrieved on 11-02-2014 from <http://wbl.worldbank.org/data>

4.3 Subjective well-being and socio-ecological transition:

- Ahuvia, A. and E. Izberk-Bilgin, 2013, "Well-being in consumer societies", in S. David, I. Boniwell and A. Conley-Ayers (eds.), *Oxford Handbook of Happiness*, 482-497.

- Alesina, A. et al., 2001a, *Inequality and happiness: Are Europeans and Americans different?*, *NBER Working Paper*, (8198).
- Alesina, A. et al., 2001b, "Why doesn't the United States have a European style welfare state?", *Brookings Papers on Economic Activity*, Fall, 187-277.
- Alesina, A. and G.-M. Angeletos, 2003, Fairness and redistribution, *mimeo*.
- Alesina, A. et al., 2005, "Work and leisure in the United States and Europe: Why so different?", *NBER Macroeconomics Annual 2005*, 1-99.
- Argyle, M., 1987, *The psychology of happiness*, London: Methuen.
- Ballas, D. and M. Tranmer, 2012, "Happy People or Happy Places?: A Multilevel Modeling Approach to the Analysis of Happiness and Well-Being.", *International Regional Science Review*, 35(1), (In-press), eScholarID:150785 | DOI:10.1177/0160017611403737.
- Baumeister, R.F., 1991, *Meanings in life*, New York: Guilford Press.
- Becchetti, L., A. Pelloni, F. Rossetti, 2008, "Relational Goods, Sociability, and Happiness", *Kyklos*, 61(3), 343-63.
- Bjørnskov, Ch., 2003, "The happy few: Cross-country evidence on social capital and life satisfaction", *Kyklos*, 56, 3-16.
- Bjørnskov, Ch., 2010, "How comparable are Gallup World Poll life satisfaction data?", *Journal of Happiness Studies*, 11, 41-60.
- Blanchflower, D.G. and A.J. Oswald, 2004, "Well-being over time in Britain and the USA", *Journal of Public Economics*, 88(7-8), 1359-86, (NBER Working Paper 7487).
- Blanchflower, D.G. and A.J. Oswald, 2008, "Hypertension and happiness across nations", *Journal of Health Economics*, 27, 218-33.
- Blanchflower, D.G. and A.J. Oswald, 2011, International happiness, *NBER Working Paper*, (16668).
- Blinder, A.S. (ed.), 1990, *Paying for productivity: A look at the evidence*, Washington, DC: The Brookings Institution.
- Boarini, R. et al., 2012, What Makes for a Better Life?: The Determinants of Subjective Well-Being in OECD Countries – Evidence from the Gallup World Poll, *OECD Statistics Working Papers*, 2012/03, OECD Publishing, <http://dx.doi.org/10.1787/5k9b9ltjm937-en>.
- Börsch-Supan, A., 2013, "Ageing, labour markets and well-being", *Empirica*, 40(3), 397-407.
- Clark, A.E., 2001, "Unemployment as a social norm: Psychological evidence from panel data", *Journal of Labour Economics*, 21(2), 323-51.
- Clark, A.E. and A.J. Oswald, 1994, "Unhappiness and unemployment", *Economic Journal*, 104(424), 648-59.
- Clark, A.E. and A.J. Oswald, 2002, Well-Being in Panels, *mimeo*, University of Warwick.
- Clark, A. Et al., 2008a, Boon or Bane? Others' unemployment, well-being and job insecurity, *CESifo Working Paper*, (2501).
- Clark, A. et al., 2008b, "Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles", *Journal of Economic Literature*, 46(1), 95-144.
- Clark, A.E. and C. Senik, 2011, Is happiness different from flourishing? Cross-country evidence from the ESS, *Working Paper 2011-04*, Paris: School of Economics.
- Corneo, G. and H.P. Grüner, 2000, "Social limits to redistribution", *American Economic Review*, 90(5), 1491-1507.
- David, S. et al., 2013, "Conclusion: The Future of Happiness", in S. David, I. Boniwell and A. Conley-Ayers (eds.), *Oxford Handbook of Happiness*, 1067-70.
- Deaton, A., 2008, "Income, health, and well-being around the world: Evidence from the Gallup poll", *Journal of Economic Perspectives*, 22(2), 53-72.

- Demir, M., 2013, "Introduction to relationships and happiness", in S. David, I. Boniwell and A. Conley-Ayers (eds.), *Oxford Handbook of Happiness*, 817-18.
- Di Tella, R. et al., 2001, "Preferences over inflation and unemployment", *American Economic Review*, 91(1), 335-41.
- Di Tella, R. et al., 2003, "The macroeconomics of happiness", *Review of Economics and Statistics*, 85(4), 809-27.
- Di Tella, R. and R. MacCulloch, 2004, Partisan social happiness, *mimeo*.
- Di Tella, R., J. Haisken-De New and R. MacCulloch, 2007, "Happiness Adaptation to Income and to Status in an Individual Panel", NBER Working Paper, (13159), <http://www.nber.org/papers/w13159>.
- Diener, E. Et al., 1999, "Subjective well being; Three decades of progress", *Psychological Bulletin*, 125(2), 276-303.
- Diener, E. and M. Chan, 2011, Happy People Live Longer: Subjective Well-being Contributes to Health and Longevity, *Applied Psychology: Health and Well-being*, March 2011.
- Dixon, H.D., 1997, "Controversy: Economics and happiness", *Economic Journal*, 107, 1812-14.
- Donovan, N. and D. Halpern, 2002, Life satisfaction: the state of knowledge and implications for government, *Strategy Unit*.
- Easterlin, R.A., 1974, "Does Economic Growth Improve the Human Lot?", in P.A. David and M.W. Reder (eds.), *Nations and Households in Economic Growth: Essays in Honour of Moses Abramovitz*, New York: Academic Press.
- Easterlin, R.A., 2010, "Happiness, Growth, and the Life Cycle", in H. Hinte and K. Zimmermann (eds.), Oxford University Press.
- Eurobarometer 78, 2012, *Public opinion in the European Union, first results*, Brussels: European Commission.
- Eurobarometer 79, 2013, *Public opinion in the European Union, first results*, Brussels: European Commission.
- Fehr E. and S. Gächter, 2000, "Fairness and Retaliation: The Economics of Reciprocity", *Journal of Economic Perspectives*, 14(3), 159-181.
- Fernández-Dols, J.M. and M.-A. Ruiz-Belda, 1990, Spontaneous facial behaviour during intense emotional episodes: Artistic truth and optical truth, <http://smg.media.mit.edu/classes/identity2004/FernandezDolsAndRuizBelda.pdf>.
- Flash Eurobarometer 367, 2013, Attitudes of Europeans towards building the Single market for green products, Brussels: European Commission.
- Flora, C., 2009, The pursuit of happiness, <http://www.psychologytoday.com/articles/200812/the-pursuit-happiness>.
- Freeman, R.B., 1998, "War of models; Which labour market institutions for the 21st century?", *Labour Economics*, 5, 1-24.
- Freiberger Stiftung, 2010, Zufrieden trotz sinkenden materiellen Wohlstands, Amerang.
- Frey, B.S. and A. Stutzer, 2000, "Happiness, economy and institutions", *Economic Journal*, 110, 918-38.
- Frey, B.S. and A. Stutzer, 2002, "What can economists learn from happiness research", *Journal of Economic Literature*, 40(2), 402-35, <http://people.ucsc.edu/~jhgonzal/100a/files/0-150.pdf>.
- Gardner J. and A.J. Oswald, 2005, [Do divorcing couples become happier by breaking up?](#), *IZA Discussion Papers*, (1788).
- Gerlach, K. and G. Stephan, 1996, "A paper on unhappiness and unemployment in Germany", *Economic Letters*, 52(3), 325-30.
- Glaeser, E. et al., 2000, "Measuring trust", *Quarterly Journal of Economics*, CXV(3), 811-846.
- Helliwell, J.F., 2002, How's life? Combining individual and national variables to explain subjective well-being, *NBER Working Paper*, (9065).

- Helliwell, J.F., 2008, Life Satisfaction and the Quality of Development, *NBER Working Paper*, (14507).
- Helliwell, J.F. and S. Wang, n.d., "The state of world happiness", in J. Helliwell et al. (eds.), *World happiness report*, 10-57.
- Helliwell, J.F. and S. Wang, 2011, Weekends and Subjective Well-Being, *NBER Working Paper*, (17180).
- Helliwell, J.F. et al., n.d., "Some policy implications", in J. Helliwell et al. (eds.), *World happiness report*, 90-107.
- Helliwell, J.F. et al., 2013, Social Capital and Well-Being in Times of Crisis, [Journal of Happiness Studies](#), May 2013.
- Hirsch, F., 1977, *Social limits to growth*, London/Henley: Routledge & Kegan Paul.
- Hobsbawm, E., [1994] 1997, *Das Zeitalter der Extreme. Weltgeschichte des 20. Jahrhunderts*, München. Hanser.
- Inglehart, R. and J.-J. Rabier, 1986, "Aspirations adapt to situations – but why are the Belgians so much happier than the French? A cross-cultural analysis of the subjective quality of life", in F.M. Andrews ed, *Research in the quality of life*, University of Michigan: Ann Arbor, 1-49.
- Inglehart, R. and H.-D. Klingemann, 2000, "Genes, culture, democracy, and happiness", in E. Diener and E.M. Suh (eds.), *Culture and subjective well-being*, Cambridge MA: MIT Press, 165-83.
- Kahneman, D., 1999, "Objective happiness", in D. Kahneman, E. Diener and N. Schwarz (eds.), *Well-being: The foundations of Hedonic Psychology*, New York: Russell Sage, 3-25.
- Kahneman, D. and J. Riis, 2005, "Living, and thinking about: Two perspectives on life", in F. Huppert et al. (eds.), *The science of well-being*, 185-304, Oxford, UK: Oxford UP.
- Kahneman, D. and A. Deaton, 2010, High income improves evaluation of life but not emotional well-being, <http://www.pnas.org/content/107/38/16489.long>.
- Kahneman, D. et al., 2010, "The structure of well-being in two cities: Life satisfaction and experienced happiness in Columbus, Ohio and Rennes, France", in E. Diener, J.F. Helliwell and D. Kahneman (eds.), *International differences in well-being*, Oxford: Oxford UP, 16-33.
- Kasser, T. and R.M. Ryan, 2001, "Be careful what you wish for: Optimal functioning and the relative attainment of intrinsic and extrinsic goals", in P. Schmuck and K.M. Sheldon (eds.), *Life goals and well-being. Towards a positive psychology of human striving*, Kirkland WA: Hogrefe and Huber.
- Kasser, T., 2006, "Materialism and its alternatives", in M. and I.S. Csikszentmihalyi (eds.), *A life worth living: Contributions to positive psychology*, Oxford, UK: Oxford UP.
- Koivumaa, H.H. et al., 2001, "Life satisfaction and suicide: A 20-year follow-up study", *American Journal of Psychiatry*, 158(3), 433-39.
- Krueger, A. and D. Schkade, 2007, "The reliability of subjective well-being measures", *Journal of public Economics*, 92, 1833-45.
- Kruse, D. and J. Blasi, 1995, Employee ownership, employee attitudes, and firm performance, NBER Working Paper, (5277).
- Layard, R., 2003, *Happiness: Has social science a clue?* Lionel Robbins Memorial Lecture 2002, <http://cep.lse.ac.uk/events/lectures/layard/RL050303.pdf>
- Layard, R., 2005, *Happiness: Lessons from a New Science*, Penguin UK, 2005.
- Layard, R. et al., 2008, "The marginal utility of income", *Journal of Public Economics*, 92(8-9), 1846-1857.
- Layard, R. et al., n.d., "The causes of happiness and misery", in J. Helliwell et al. (eds.), *World happiness report*, n.d., 58-89.
- Lucas, R.E. et al., 2004, "Unemployment alters the set-point for life satisfaction", *Psychological Science*, 15, 8-13.
- Luechinger, S., 2009, "Valuing air quality using the life satisfaction approach", *Economic Journal*, 119 (March), 482-515.

- Luechinger, S. et al., 2010, "Why does unemployment hurt the employed? Evidence from the life-satisfaction gap between private and public sector", *Journal of Human Resources*, 45(4), 998-1045.
- Mulgan, G., 2013, "Well-being and public policy", in S. David, I. Boniwell and A. Conley-Ayers (eds.), *Oxford Handbook of Happiness*, 517-32.
- Noll, H. and S. Weick, 2010, "Subjective well-being in Germany: evolutions, determinants and policy implications", in B. Greve (ed.), *Happiness and social policy in Europe*, Cheltenham: Elgar, 70-88.
- Norton, M.I. and D. Ariely, 2011, "Building a better America – One wealth quintile at a time", *Perspectives on Psychological Science*, 6, 9-12.
- OECD, 1995, *Employment Outlook*, Paris: OECD.
- Oswald, A.J., 1997, "Happiness and economic performance", *Economic Journal*, 107, 1815-31.
- Oswald, A.J. and N. Powdthavee, 2005, Does happiness adapt? A longitudinal study of disability with implications for economists and judges, Department of Economics, University of Warwick.
- Prescott, E.C., 2004, "Why do Americans work so much more than Europeans?", *Federal Reserve Bank of Minneapolis Quarterly Review*, 28(1), 2-13.
- Prisching M., 2009, "Fetisch Wachstum. Die politische Ausweglosigkeit der Steigerungsprogrammatik", *Wissenschaft und Umwelt interdisziplinär*, 13, 136-49.
- Putnam, R.D., 2001, *Bowling alone: The collapse and revival of American community*, New York: Simon & Schuster.
- Rabin, M., 1998, Psychology and economics, *Journal of Economic Literature* 36(1), 11-46.
- Rehdanz, K. and D. Maddison, 2005, "Climate and Happiness", *Ecological Economics*, 52(1), 111-125.
- Runciman, W.G., 1966, *Relative deprivation and social justice*, Henley, UK: Routledge.
- Sacks, D.W. et al., 2010, Subjective well-being, income, economic development and growth, NBER Working Paper, (16441).
- Safer, M., 2008, And the happiest place on earth, *CBS News*, cited in Tov and Au, 2013, 453.
- Sandvik, E. et al., 1993, "Subjective well-being: The convergence and stability of self and non self report measures", *Journal of Personality*, 61(3), 317-42.
- Shedler, J. et al., 1993, "The illusion of mental health", *American Psychologist*, 48(11), 117-31.
- Stevenson, D. and J. Wolfers, 2008, "Economic growth and subjective well-being: Reassessing the Easterlin Paradox", *Brookings Papers on Economic Activity Spring 2008*, 1-87.
- Stutzer, A. and B.S. Frey, 2007, "What happiness research can tell us about self-control problems and utility misprediction", in B.S. Frey and A. Stutzer, *Economics and psychology. A new promising cross-disciplinary field*, Cambridge, MA: MIT Press, 169-95.
- Suh, E.M., 2000, "Self, the hyphen between culture and subjective well-being", in E. Diener and E.M. Suh (eds.), *Culture and subjective well-being*, Cambridge, MA: MIT Press, 63-86.
- Thompson, S. et al., 2013, "Well-being and Sustainable Development", in S. David, I. Boniwell and A. Conley-Ayers (eds.), *Oxford Handbook of Happiness*, 498-516.
- Tichy, G., 2013, Finanzkrise und Lebenszufriedenheit, *Wirtschaft und Gesellschaft* 39(3), 323-42.
- Tkach, C. and S. Lyubomirsky, 2006, "How do people pursue happiness? Relating personality, happiness increasing strategies and well-being", *Journal of Happiness Studies*, 7, 183-225.
- Tov, W. and E.W.M. Au, 2013, "Comparing well-being across nations: Conceptual and empirical issues", in S. David, I. Boniwell and A. Conley-Ayers (eds.), *Oxford Handbook of Happiness*, (ed.), 448-64.
- Uhde, N. 2010, "Soziale Sicherheit und Lebenszufriedenheit: Empirische Ergebnisse", *Perspektiven der Wirtschaftspolitik*, 11(4), 407-39.
- Veenhofen, R., 2000, "Freedom and happiness in forty-four nations", in E. Diener and E.M. Suh (eds.), *Culture and subjective well-being*, Cambridge MA: Cambridge University Press, 257-88.
- Vittersø, J., 2013, "Introduction to psychological approaches to happiness", in S. David, I. Boniwell and A. Conley-Ayers (eds.), *Oxford Handbook of Happiness*, 11-16.

- Weir, B., 2008, "Has Singapore found the secret to satisfaction?", *ABC News*, cited in Tov and Au, 2013, 456.
- Welsch, H., 2002, "Preferences over prosperity and pollution: environmental valuation based on happiness surveys", *Kyklos*, 55(4), 473-94.
- Wulfgramm, M., 2011, "Can activating labour market policy offset the detrimental life satisfaction effect of unemployment?", *Socio-Economic Review*, 9, 477-501, doi:10.1093/ser/mwr006.

4.4 Modelling the inter-linkages between macroeconomic, social and ecological aspects of a sustainability transition and long-term growth:

- Blanchard, O., F. Jaumotte, and P. Loungani, 2013, Labor market policies and IMF advice in advanced economies during the Great Recession, IMF Staff Discussion Note, SDN/13/02, March.
- Blanchower D.G. and A.J. Oswald, 1994, *The Wage Curve*, Cambridge, Massachusetts and London: MIT Press.
- Boeters, S. and L. Savard, 2013, The labor market in computable general equilibrium models, in: Dixon, W. and D. Jorgenson, *Handbook of CGE Modeling*, North Holland, Elsevier.
- Borio, C., P. Disyatat, and M. Juselius, 2013, Rethinking potential output: Embedding information about the financial cycle, BIS Working Papers, No 404. Bank for International Settlements, Monetary and Economic Department, February.
- Busl, C. And A. Seymen, 2013, (Spillover) effects of labour market reforms in Germany and France, *wwwforEurope Working Paper no 8*, June (http://www.foreurope.eu/fileadmin/documents/pdf/Workingpapers/WWWforEurope_WPS_no008_MS75.pdf).
- Caballero, R.J., 1993, Durable goods: an explanation of their slow adjustment, *Journal of Political Economy*, 101, 351-384.
- Card, D., 1995, The wage curve: a review, *Journal of Economic Literature*, 33, pp. 785-799.
- Carroll, C.D., 1997, Buffer-stock saving and the life cycle/permanent income hypothesis, *Quarterly Journal of Economics* 112, 1-55.
- Chen, Q., E. Dietzenbacher, E., B. Los and C. Yang, 2010, Partially endogenized consumption: A new method to incorporate the household sector into input-output models, *paper presented at the 18th international input-output conference*, Sidney, July.
- CPB Netherlands Bureau for Economic Policy Analysis (Project leader), CAPP (Co-leader), 2013, Study on the impacts of fiscal devaluation, *Taxation Papers, Working Paper N.36-2013*, European Commission.
- Faia, E., W. Lechthaler, and C. Merkl, 2012, Fiscal stimulus and labour market policies in Europe, *LASER Discussion Papers – Paper No. 68*, University of Erlangen_Nuernberg, October.
- Farhi, E., G. Gopinath, and O. Itskhoki, 2011, Fiscal devaluations, *NBER Working Paper Series, Working Paper 17662* (<http://www.nber.org/papers/w17662>), December.
- Fischer-Kowalski, M., Wiedenhofer, D., Haas, W., Pallua, I., Hausknost, D., 2013, Developing Resource use Scenarios for Europe, *WWWforEurope Working Paper*, (25), (http://www.foreurope.eu/fileadmin/documents/pdf/Workingpapers/WWWforEurope_WPS_no025_MS35.pdf)
- Folmer, K., 2009, Why do macro wage elasticities diverge? *CBP Discussion Paper No. 122*, CBP, The Hague.
- Goettle, R.J., Ho, M.S., Jorgenson, D.W., Slesnick, D.T. and P.J. Wilcoxon, 2007, *IGEM, an inter-temporal general equilibrium model of the U.S. economy with emphasis on growth, energy and the environment*, Prepared for the U.S. Environmental Protection Agency (EPA), Office of Atmospheric Programs, Climate Change Division, EPA Contract EP-W-05-035.

- Hall, R.E., 1988, The relations between price and marginal cost in US industry, *Journal of Political Economy*, 96, 921-947.
- Khazzoom, J.D., 1989, Energy savings from more efficient appliances: a rejoinder, *The Energy Journal*, 10, 157-166.
- Kim, K., Kratena, K. and G. J. D. Hewings, 2013, The Extended Econometric Input-output Model With Heterogeneous Household Demand System, REAL 13-T-5, Regional Economics Applications Laboratory (REAL), University of Illinois.
- Kratena, K., G. Streicher, 2014, FIDELIO's ADAGIO – A family of regional econometric input-output models, in: Schmid, E. and S. Vogel (eds.), *The Common Agricultural Policy in the 21st century*, Festschrift für Markus F. Hofreither, facultas, Wien.
- Kratena, K., G. Streicher, U. Temurshoev, A. F. Amores, I. Arto, I. Mongelli, F. Neuwahl, J. M. Rueda-Cantuche, V. Andreoni, 2013, FIDELIO 1 – Fully Interregional Dynamic Econometric Long-term Input-Output Model for the EU27, JRC Scientific and Policy Reports, JRC81864, Joint Research Center/Institute for Prospective Technology Studies, European Commission.
- Krebs, T., and M. Scheffel, 2013, Macroeconomic evaluation of labor market reform in Germany, IMF Working Paper, WP/13/42, February.
- Luengo-Prado, M.J., 2006, Durables, nondurables, down payments and consumption excesses, *Journal of Monetary Economics*, 53, pp. 1509-1539.
- de Mooij, R. and M. Keen, 2012, "Fiscal Devaluation" and fiscal consolidation: The VAT in troubled times, IMF Working Paper, WP/12/85, March.
- Roeger, W., 1995, Can imperfect competition explain the difference between primal and dual productivity measures? Estimates for US manufacturing, *Journal of Political Economy*, 103(2), 316-330.
- in't Veld, J., 2013, Fiscal consolidations and spillovers in the Euro area periphery and core, in: *European Economy, Economic Papers* 506, October.

Annex

Annex 1 – Area Summaries

Area 2: Abstracts of relevant milestones and deliverables

202.2 MS30 List of well-being indicators suitable for inclusion in socio-ecologically extended macroeconomic models

Lead: *Sigrid Stagl (WU)*

The list presents areas of well-being and a corresponding pool of available indicators and indicator systems which go beyond the narrow concepts of national economic accounts. The specific indicators listed here have in common that data are available for one or more EU countries. The indicator list makes a contribution to a wider review within the project on suitable dimensions of well-being and sustainability with the aim of expanding the macroeconomic analysis by important dimensions and being useful for policy advice.

As much as possible the list includes indicators compatible with contemporary social science thinking (e.g. stock-flow, capabilities). The service / functionings-based approach is illustrated by the energy system. Here the focus lies on energy service indicators instead of energy flows as it is not the quantity of energy used by households and companies that is relevant to welfare, but rather the energy services delivered. In buildings, for example, the energy required to deliver a “well-tempered living space” depends on the thermal quality of the building (thermal transmittance of walls, windows, rooftops, etc.) and the heating system. In this framework indicators reflect services, stocks and flows. Where appropriate, indicators differentiated by men and women will be developed.

The pool presented in this deliverable includes:

- Indicator Systems
- Composite Indices
- NAMEA and Material flow accounts

This deliverable forms the basis for an assessment carried out in task 202.2 by WU, WIFO and UAB. A subset of indicators will be selected based on different theoretical frameworks, e.g. services / functionings, needs. Some of the indicators will be included in the macro-economic models in order to account for key dimensions of sustainability.

Within the project, this deliverable contributes primarily to the central question 1. It forms a basis for more a comprehensive representations of the social and ecological dimension in macro-economic models. This may lead to a better understanding of synergies as well as conflicts between sustainability and economic growth.

203.1 MS31 Literature review on behavioural perspectives on transitions

(note that this also summarizes 203.4 MS34, List of suggestions for behavioural elements in the macroeconomic model (input to WP 205))

Lead: *Jeroen van den Bergh (UAB)*

In this paper we investigate opportunities to integrate various theories and disciplinary views on behaviour into the thinking about sustainable transitions, to arrive at recommendations for effective policies (the topic of the related MS33). Transition policy needs though to account for the bounded rationality and social interaction of agents so as to arrive at a realistic view of the limits and opportunities for realizing a transition. We consider as relevant theoretical perspectives for transitions and behavioral analysis: rational choice theory, structuralism, functionalism, behavioral economics, evolutionary economics, social network theory, public choice theory, institutional theory and theories of conflict and power struggle. We have considered as stakeholders: consumers, producers, investors and the financial sector, innovators and governments.

This milestone mainly addressed the central questions 3 and 5. Especially the section on innovation and learning discussed how environmental innovations can be supported (question 3). We conclude, among others, that the role of prices and price corrections in guiding innovation is grossly neglected, that is, correct prices not only stimulate right choices by consumers and producers with given technology but also stimulate better choice in complex innovation processes as all the prices information about resources, labor, capital for different opportunities reflects better the real social costs including environmental externalities.

With regard to question 5, we select a few insights. First is the finding that altruism and reputational concerns stemming from intrinsic motivations can be discouraged by extrinsic motivations like rewards or punishments. The dilemma here is, however, that without extrinsic motivation we cannot expect any significant change in the pollutive behavior of consumers and producers alike. Next, it is important to account in policy for the behavioral feature that consumers are often much more concerned about status and image than about environmental performance of purchased goods and services. This suggests that status feelings have to be redirected to environmentally well performing alternatives. Next, creating opportunities for environmentally beneficial behaviors to spread through social groups is important to facilitate transitions. In the case of energy saving, for example, norms can sometimes be more powerful than information provision. The difference between descriptive norms (dominant behaviors) and injunctive norms (approved or disapproved behaviors in a particular society) is relevant. If the aim is to change behavior, focusing on injunctive norms is the appropriate strategy. If, on the other hand, the goal is to prevent negative behavior, both injunctive and descriptive norms can be used in persuasive messages. In addition, more on the bounded rationality than social interaction side, to develop more sustainable habits, the emotional appraisal of consumer activities has to change. Last but not least, the role of framing in communication of information (e.g., about climate change), but also in the provision of product information (and the generally more problematic role of commercial marketing) deserve more attention. There is a lot known now from experiments with differently framed messages. The milestone also discusses the

relevance of gender, such as difference in risk perception between men and women which is relevant for environmental decision-making (consumers and producers), and the need for mixed composition of research teams on environmental innovation.

203.3 MS33 Paper on policy responses by different agents/stakeholders in a transition

Lead: *Jeroen van den Bergh (UAB)*

This short companion paper to milestone 31 considers all there identified and discussed stakeholders in different stages of a sustainability transition and matches their behavioral features and diversity to policies. This leads to an assessment of potential or expected responses of policy to a range of policies and policy instruments, and ultimately provides information about which behavioral elements should be taken into account for sustainability transition policies in order to increase policy effectiveness. The analysis resulted in the proposal of a policy mix (or package) to guide a sustainability transition, involving innovation, regulatory, information provision and other policies. The connection of different policies with the various stakeholders, stages and levels in a transition is clarified. Because of the many detailed tables involved it is very difficult to summarize the findings. The study involves an assessment of potential or expected responses of stakeholders to a range of policy instruments. Following the Multi-Level Perspective framework to conceptualize sustainability transitions, we classify the various transition policies at niche, regime and landscape levels. Next, we offer a complementary classification of policies based on a distinction between social preferences and bounded rationality. Any policy has an innovation impact and therefore should be rightly set or defined. The three levels derive from transitions theory and concrete policies at each level are mentioned in between brackets: niche (creation of network interactions, local experiments, subsidies or price guarantees for expansion), regime (regulating of dirty activities, escaping of lock-in, limiting the political and economic power of regimes, enhancing technical and resource diversity), and landscape (promotion of civic debate, information provision, policy integration).

The central questions addresses were 3, 4 and 5. We propose transition policy as involving incentives to include previously external costs into one's private decision-making (consumers, producers, investors and innovators alike). It further includes the stimulation and management of learning processes, and creating awareness to keep opportunities and options open to increase the flexibility and adaptation capacity of social and technological systems. It requires a multi-actor and multi-domain approach with explicitly formulated long term policy goals. Finally, it means one should pay attention to the potential friction between various goals supported by different stakeholders. There is no generally agreed upon transition end goal, and neither is there a common social welfare function. Linked to this, also problematic is that political groups have very different implicit social welfare functions – in terms of performance on economic, environmental and equity issues. And if policy makers and politicians agree on policies to be implemented, still many different types of policy failures are possible. These can be related to the process of policy design and implementation of policies (including the unpredictability of behavioral responses of stakeholders to new policies). Finally, we note that the concepts of 'strategic niche management', transition management and niche networks, central to writings on

transition policy, are probably not detailed and realistic enough about the behavior of the various actors involved in transitions and their interactions. As a result, one may be easily overly optimistic about the effectiveness of transition policies.

204.1 MS35 Research paper on resource use scenarios for Europe

Lead: *Marina Fischer-Kowalski (UNI-KLU)*

We review existing resource use scenarios for materials, energy and land on global and European levels, for a time horizon of 2020 and 2050. We assume that global resources available for European production and consumption strongly depend upon the resource demand of the rest of the world and therefore build on scenarios of global resource use for countries classified by their stage of development and their population density as developed within the framework of the UNEP panel on sustainable resource management for the time period 2000-2050. In this context, we develop a limited number of resource use scenarios for Europe in the global context, including the impact of trade. Scenarios are formulated in biophysical terms, building upon demographic projections, under varying assumptions about global convergence of rates of resource use, about regional origin of resources (trade) and about global constraints to resource availability.

With regard to the first three central questions formulated, we conclude as follows:

- 1.) According to our findings, the past four decades saw the EU's energy and material input stagnating while economic growth continued. An absolute reduction, though, was an exception. The "freeze scenario" of European resource use is almost identical with the trend scenario. With regard to the transformation scenario that would require a halving of resource use, there is no precedence for concluding on economic growth. According to the projections and scenarios reviewed, it seems that Europe would fare best by adjusting to low economic growth anyway. The linkage between the population's wellbeing and resource use is weak – but the preservation (or even improvement) of wellbeing would be a matter of resolving distributional challenges.
- 2.) With reducing resource use, regional cohesion is not under threat as it is a matter of rising world market resource prices acting as an incentive to improving resource productivity. There will rather be convergence. Concerning policies such as reducing fossil fuel use, or influencing the human diet towards a lower share of animal based food, reducing urban sprawl or moving in a direction of work sharing, there are winners and losers.
- 3.) If Europe takes its climate policies seriously and coherently shifts away from fossil fuels, this alone will reduce material resource use drastically as solar, wind and water power energy generation, once installed, requires only very few resources (and now, fossil fuels amount to one quarter to one third of all material resources, plus substantial resource use for transportation and supply infrastructures). The second most powerful strategy would be densification of urban settlements and reduction of urban sprawl. This would save resources in infrastructure investments, in energy use for heating and transportation and in construction. Finally, a reduction of animal based food would be a win-win-strategy both for health and for reasons of saving resources (and climate protection).

Area 3: Abstracts of relevant milestones and deliverables

Competitiveness under New Perspectives, WWWforEurope Working Paper Series, Issue 44, October 2013.

Karl Aiginger, Susanne Sieber and Johanna Vogel

This paper aims to redefine the term competitiveness to enhance its usefulness for performance evaluation of countries and regions as well as for policy conclusions. We attempt to establish a definition that is adequate if economic policy strives for a new growth path that is more dynamic, socially inclusive and ecologically sustainable, and if this transition has to be enacted under the challenges of globalisation, new technologies, climate change and fiscal constraints. We tentatively apply the proposed definition to evaluate the "competitiveness" of EU member states as well as to compare Europe's "competitiveness" with that of the US (and, where possible, with Switzerland, Japan and China).

In the first part of the paper, we examine the evolution of the concept from a focus on "inputs" at the firm level (price competitiveness) to economic structure and capabilities at the country level and finally to "outcome" competitiveness, where outcomes are defined in a broad sense and in the context of the WWWforEurope project. We propose to define competitiveness as the "ability of a country (region, location) to deliver the beyond-GDP goals for its citizens".

In the second part of the paper, the performance of the EU-27 countries is assessed along the dimensions described above. We begin with price competitiveness and then proceed to economic structure and countries' capabilities regarding innovation, education, the social system, institutions and environmental preferences. We conclude with outcome competitiveness in terms of economic, social and ecological outcomes. Overall, we compile a database of 68 indicators that describe these different aspects of competitiveness.

In the third part of the paper, we investigate empirically the relationship between "input" and "outcome" competitiveness for the EU-27 using panel data analysis for the period from 2000 to 2010. We construct a composite indicator for outcome competitiveness consisting of income, social and ecological pillars, following the beyond-GDP literature. This measure is then econometrically related to composite indicators of the three groups of input indicators: price competitiveness, economic structure, and capabilities. The results of panel OLS regressions suggest that both economic structure and capabilities on aggregate are positively related to our measure of outcome competitiveness, while a negative relationship is found for the wage component of price competitiveness. Among the different dimensions of capabilities, ecological preferences and – less robustly – institutions appear to be positively associated with outcome competitiveness.

Clusters and the New Growth Parth for Europe, WWWforEurope Working Paper Series, Issue 14, July 2013

Christian Ketels and Sergiy Protsiv

This paper outlines elements of a conceptual framework that clarifies the role that clusters play relative to government policies and actions of individual companies in supporting the

emergence of 'High Road'-strategies that lead to better New Growth Path-related outcomes. It then focuses on creating a new set of data that can start shedding light on the empirical relevance of this framework. The first main section of the paper draws on a new set of employment and wage data across European clusters. The data is used to analyze whether cluster presence is significantly correlated with higher wages, which as an indicator of higher productivity, are likely to signal the presence of 'High Road'-strategies. We then take a closer look at the scale of the relationship relative to location-specific and other effects. We find cluster presence to be significantly related to higher wages, with the effect being moderate but meaningful. This suggests that cluster presence enhances the ability of economic activities to deliver high performance, but is unlikely to be able to substitute weak business environment conditions. The second section then deploys a wide range of regional performance data collected for the European Competitiveness Index and the European Cluster Observatory. We create indicators for New Growth Path performance and its main dimensions, and classify European regions by their performance patterns. This provides critical insights into the compatibility of the different economic, social, and ecological objectives pursued. We then relate these outcomes to the presence of strong cluster portfolios and strong business environment conditions. Both are most strongly associated with stronger economic outcomes, with lower impact on other dimensions of the New Growth Path. The third section creates a new dataset of cluster initiative intensity at the regional and cluster category-level. It also classifies close to 1000 cluster initiatives in Europe by their engagement in New Growth Path-related activities. We then deploy this data to test the impact of cluster initiatives on regional New Growth Path-performance. Overall, we find evidence consistent with clusters playing a role in making 'High Road'-strategies more likely to emerge. We also find evidence that European regions differ in their strategies towards these goals, with some being able to pursue all three dimensions in parallel. Cluster initiatives widely engage in New Growth Path-related activities, indicating their potential as a tool in mobilizing joint action in these areas.

The Impact of Green Innovation on Employment Growth in Europe, WWWforEurope Working Paper Series, Issue 50, December 2013

Georg Licht and Bettina Peters

This paper defines the scope of ecological innovations and their employment effects by exploiting data from the Community Innovation Surveys for different EU member states. In particular, we compare the employment impact of product and process innovation with and without specific environmental characteristics. Hence, the paper contributes to the discussion of impacts of green innovation on employment growth in Europe.

The question how innovation affects employment is non-trivial since various channels exist through which different kinds of innovation may destroy existing jobs (displacement effects) or may create new jobs (compensation effects). In general, the majority of empirical studies finds an employment-stimulating effect of product innovation whereas the effect of process innovation is ambiguous ranging from significantly negative to positive. However, up to now empirical

evidence on the employment effect of environmental innovation is scarce. Most of these studies demonstrate a positive impact of eco innovation on employment.

The paper employs the latest CIS data available from EUROSTAT microdata safe center for Bulgaria, Cyprus, Czech Republic, Germany, Estonia, France, Hungary, Italy, Lithuania, Luxemburg, Latvia, Malta, Netherlands, Portugal, Romania, and Slovakia. Hence, the data covers a broad range of member states from Western Europe, Southern Europe, as well as the New Member states. We estimate country-specific as well as pooled regression for the sample of member states.

Using the results of derived labor demand functions we decompose employment growth 2008 to 2010 into the contribution of several sources of employment growth. The decomposition distinguish the employment impact of

- country-specific general productivity trends in the production of old products,
- environmental process innovation,
- process-innovation without any environmental-friendly process innovation
- the output growth of old products of non-innovating companies, companies with non-environmental process innovations and only environment-process innovations,
- the substitution of old product by new products
- the output growth due to new products with environmental friendly characteristics and,
- the output growth due to new products without environmental-friendly characteristics.

Overall, the results show that the general productivity trend had a strong negative impact on employment growth. More surprisingly, specific process innovations both with and without environmental-friendly characteristics only have a minor impact beyond the general productivity trend. The general growth in output (e.g. linked to business cycle) had the biggest impact on employment growth. This refers to both companies with and without product innovation. Product innovations contribute significantly to employment growth even if take into account that a significant share of new products just substitute old products. Overall, the contribution of product innovation is due to product innovation with environmental-friendly and without any environmental-friendly characteristics. These patterns hold both for manufacturing and service industries. However, product innovation and especially environmental-friendly product innovation are far less important determinants of employment growth for services than for manufacturing.

This global picture holds for all countries albeit the paper uncovers country-specific characteristics. This country-specific pattern might be related to country-specific environmental policies, the distance of a country to the productivity frontier, or/and the industry structure (e.g.. the relative importance of car or mechanical industry within manufacturing).

From a policy point of view one should note that environmental process innovations, e.g. caused by country-specific environmental regulation policies, in all countries have either none or only a minor impact on employment beyond the general country-specific productivity trend. Hence, our result did not point towards the often feared negative employment consequences of environmental policies affecting production processes. So, there seems to be no significant

trade-off between stricter regulation of production processes and employment in period 2008-2010 which are covered by our data. In addition, product innovations were a significant driver of employment growth in all countries and this also related to environmental-friendly product innovations. In manufacturing in some countries (e.g. Germany, Slovakia, Czech Republic) the employment impact of new products with environmental-friendly characteristics even outperforms the employment impact of new products without environmental-friendly characteristics. Only for some countries (e.g. Bulgaria, Malta, Cyprus) the paper found significantly larger impact of ordinary product innovation compared to environmental-friendly new products.

The analyses provide some interesting policy insights: Overall, we did not find a trade-off between employment growth and the introduction of environmentally-friendly processes (e.g. in terms of reductions of material or energy inputs, safer work environments, or negative environmental consequences of production). Hence, there seems to be some room for industrial and regulation policies to induce the increased use of environmentally-friendly production processes in manufacturing as well as in services. Even more, a stronger focus of environmental-friendly product innovation compared the non-environmental-friendly product innovation will most likely not have different employment impacts. An obvious implication then is that an industrial or environmental policy which generated more favorable conditions for environmental product innovation will not induce a reduction of a country's ability to profit from product innovation in general with regard to employment growth. This is especially important if we take into account limits in the ability of firms and countries to generate innovation. Hence, the tradeoff between environmental regulation and employment growth seems to be small as long as the environmental policy provides a medium or long-term orientation so that firm can translate these incentives into process and product innovation with more favorable environmental characteristics. The results also show that in some countries such policies might even increase the employment impact from innovation.

Specific analysis of the eco-innovation-employment growth-link for Germany, WWWforEurope Working Paper Series, forthcoming

Georg Licht and Bettina Peters

This paper basically looks in more detail at Germany and finds similar results as presented above, only more strongly so for Germany, i.e. eco-product innovation can play a beneficial role for employment growth.

Who drives smart growth? The contribution of small and young firms to inventions in sustainable technologies, WWWforEurope Working Paper Series, Issue 47, November 2013

Birgit Aschhoff, Georg Licht and Paula Schliessler

Europe's innovation potential is currently dominated by well-established large companies. In most member countries the bulk of R&D expenditures are spent by large companies. Following OECD data, SME's share in R&D amounts to 8% in Germany or Japan, around 15% in US,

France; Korea or Italy, about 20% in Sweden, Finland, or Switzerland, about 10% in Netherlands, Austria, Poland, and about 50% in Poland, Ireland, Slovakia, or Greece. First of all, these figures point to a considerable heterogeneity with regard to the importance of SMEs in national R&D activities.

However, young companies are said to be the driving force behind radical innovation which will be a source of employment and growth in future. In addition, the weakness of Europe is not only the small number of high-tech startups but more specifically the number of high-tech startups which accomplish to continuing, rapid growth. However, there might be significant technology specific heterogeneity with regard to the contribution of SMEs and young firms to innovation.

The central question of the paper is whether SME and young firms might be agents with a special contribution to a new growth path in Europe. We took new renewable energy technologies as an example to test whether the contribution of SME and young firms is larger in this technology area compared to invention as measured by patenting. In order to focus on the most valuable patents we use patent applications at the European Patent Office which were also filed with the USPTO and the Japanese Patent Office ("triadic patent applications").

The analysis proceed in two steps: The paper looks first at trends in international patenting and compares triadic patent application in the field of energy with all triadic patent applications by country of inventors. The idea is to highlight the role of the EU and its member states in inventive activity in a technology-field which is of special relevance for a new, sustainable growth path. In the second step we look at the contribution of SME and young firms to such a new growth path by a detailed analysis of triadic patent applications by German companies as the SME's share to R&D is the smallest compared with all other EU member states as well as compared with OECD member states (except Japan). The focus on Germany is motivated by two reasons - to facilitate the analysis and to focus on the most extreme case of the firm-size R&D distribution which is observed in EU and OECD member states.

The study employs the WIPO "Green Inventory" classification to identify energy-related patents via the international patent classification used by all patent offices to assign patents by technology and potential fields of application. This classification comprises as main technology classes alternative energy production, transportation, energy storage, waste management, agriculture/forestry, regulatory and design aspects, and nuclear power generation. The number of green inventory patents increased from 1991 to 2007 by a factor of 2.5 to 12.500 patent applications. The majority of this increase is observable in renewable energy products, storage of energy, design and management of energy systems, and waste management. Patents related to nuclear power account for 4% of green inventory patents and this share declined even more to 1% in 2007. Surprisingly, the increase of green inventory patent applications at the EPO more or less equals the increase in overall patent application at the EPO. Hence, the share of green inventory patents in total patent application at EPO was constant and fluctuating always between 8-10% with no visible trend. Similarly, albeit the increase in the number of triadic patents is less impressive (only by a factor of 1.4) the structural features are the same.

Overall, the importance of green patent activities does not greatly vary between countries or regions. In 2007, the share of green patent applications in all patent applications at the EPO lies

between 7% and 12%. Interestingly, the new member states and southern Europe are at the upper end of the range (12 % and 10%, respectively) - besides Japan (11%) and the US (10%). Green patents are slightly less important for Northern Europe and China (both 7%). Focusing on more valuable patent application (“triadic patent application”), green technologies become more important in Germany, Korea and China and lose importance in Southern Europe.

The second step linked sustainable growth to the “entrepreneurial” economy by examining to which degree small and young firms are driving sustainable patenting. We find SMEs to be responsible for about 15% of all patent applications. This is the same for the WIPO Green Inventory classified “green” patents. Around half of patent applications of SMEs are made by young firms. About one half of all patent applications by SMEs are filed by micro firms. When narrowing down the analysis to triadic patents, we find the contribution of SMEs to decrease to about 9% of all patent applications which is probably caused by the larger costs of applying and maintaining triadic patents than EPO patents. The contribution to green patenting is even lower for triadic patents with only 6 percent of all green patents coming from SMEs.

In the third step of the analysis, based on the link of German firm data to patent applications at the European Patent Office, we analyzed at the firm level whether small and young firms are more or less likely to file sustainable patents than other firms. The results show that large firms are significantly more likely to file both patents in general and green patents. We do find that, for micro, small and medium size firms, the negative effect on patenting compared to the reference category of a large firm is less strong for the younger firms. This effect exists both for the generation of patents in general and the generation of green patents. Therefore there does not seem to be a particular advantage for small or young firms in producing sustainable, green patents. Even more, SME and young firm seem to face larger obstacles to start inventing in green energy technologies than in other technology fields. In any case SME and young firms will probably not be an important driver of new technologies like in some other fields of technology.

Of course we have to admit that our sample only covers international patent applications for the priority year 2007 or earlier. Hence, things might have changed in the meantime due to e.g. extended government support for innovation in green energy fields. However, this question can only be examined with future editions of the PATSTAT data which fully covers more recent years. In addition, we cannot rule out that SME and/or young firms are especially important for patents which are radical driver of technological change. To address this question several measurement issues needs to be solved and/or existing measurement approaches need verification. However, this is beyond the scope of our study.

Industrial Policies in Europe in Historical Perspective, WWWforEurope Working Paper Series, Issue 15, July 2013

Christian Grabas and Alexander Nützenadel

This research paper provides a solid historical overview of European industrial policy during the post-WWII era, extending the time horizon up to the 1990s. Our research focus is the EU 15. Unlike previous publications, this paper outlines the most important characteristics and drivers

of European industrial policy in a comparative and transnational perspective in order to provide some conclusions about policy impacts, historical policy continuities and national policy convergence, looking at changing institutional settings especially in transition periods and asking finally how these historical lessons could be fruitful for further research on future effective political action. This paper provides unequivocal evidence that state industrial policy in Europe after 1945 had been always one of the most controversial policy fields and that its scopes and instruments differed greatly between countries and changed over time. Industrial policy was not a novel phenomenon of the postwar era. Beyond the immediate goals, it was part of what can be considered the economic culture of every country. National traditions, historical legacies and path-dependencies did play an important role and may explain the enormous differences between nations and regions in Europe, even when they had to face similar challenges. The paradigm shift towards an interventionist industrial policy approach implemented in most European countries after 1945, which persistently prevailed until the 1990s, fostered economic structural change and was partially very effective in supporting high economic growth during the prosperity years, but had often led to an inefficient allocation of national economic resources in many countries in the longer run. The more important and effective factors that enhanced industrial productivity in the long run, were, firstly, industrial policies establishing national and/or regional promising effective incentive structures for the private sector, and secondly industrial policies encouraging openness to trade and investment, by creating an international environment favourable to competition, innovation and technology transfer. For Western Europe, it was increasing trade and investment openness, largely, but not exclusively, under the heading of European integration.

Innovation in the energy sector, WWWforEurope Working Paper Series, Issue 31, July 2013

Klaus Friesenbichler

This study analyses the diffusion of renewable energy (RE) technologies. It analyses the transition dynamics as the sector broadens its energy mix and changes its capital stock. This shift is found to be desirable from an environmental, geopolitical and economic perspective. Yet, it greatly increases the technical and industrial complexity, and is not Pareto-efficient. We focus on wind and solar power, and discuss their promoted deployment against the energy policy principles of the EU. Put drastically, the promotion of 'sustainability' undermined 'competitive' mechanisms. This has potentially adverse effects on the 'security of supply' due to the market design that seeks to keep prices low. RE outperforms conventional facilities. Emergency capacities, however, are also exiting, especially in Germany. If markets are seen as one, there seems to be a threshold of wind and solar power that the current back-up system can incorporate without risking the security of supply. The policy relevant crux lies in conflicting mechanisms: the top-down promotion and planning policies undermine the bottom-up market selection. Then again, without interventions the market does not provide the socially desired outcomes. If tensions aggravate further, the implementation of the new technology base is likely to stall. In addition, the generous promotion resulted in the fast deployment of RE, which may have shortened the 'formative phase' of the diffusion process. A longer formative phase would

have created more learning effects and fostered more incremental innovations. In addition, costs of subsidies are allocated differently across countries. Mechanisms that allocate costs to the public budget have greater acceptance rates than budget neutral ones that assign costs to consumers. The latter affect households asymmetrically across income classes. Also ownership structures changed; a large number of actors now constitute the energy sector. Citizens increasingly appeared as producers and investors, which stimulated the social acceptance of RE, and in some cases unlocked initially unfavourable vested interests.

Industrial diversity and innovation spillovers: dynamic innovation and adoption, WWWforEurope Working Paper Series, Issue 45, November 2013

David Bailey and Philip Amison

The paper provides a review of the literature covering industrial diversity and innovation spillovers. In particular, it includes discussion of the literature on specialisation and diversification as well as on smart specialisation. In the context of European industrial policy, this is described as a strategy through which - rather than spreading their investment in R&D and innovation thinly across several frontier technology research fields - countries or regions instead concentrate their investment in programmes that complement their other productive assets. The review also considers the move to increasingly 'open' approaches to innovation, shifting from taking place within a single firm to taking place across firm boundaries. Such open innovation approaches have been found to raise profits, increase speed to market, enable firms to expand their markets and is desirable at times of technological change. In the automotive industry (relevant to the case study work that has been undertaken), the innovation process has traditionally been shaped by the large automotive firms (OEMs) and has mostly been undertaken in-house. As the range of technologies that are important to success in the industry has expanded - spanning electronics, to digital, to new fuel and power technologies - in-house R&D has become decreasingly relevant. The role of specialist suppliers of knowledge, R&D and components has become crucial for innovations of a more systemic nature. The review will also consider the notion of 'phoenix industries'. The latter have been described as clusters of small and medium-sized businesses working with broadly similar technologies that have sprung up in former industrial areas.

The paper goes on to describe a case study that has been undertaken of the 'low carbon vehicles' sector in the UK midlands. The West Midlands, in particular, has suffered significant deindustrialisation since the 1970s, particularly in the automotive sector. More recently, however, it has developed an important presence in automotive design and advanced engineering, particularly among small and niche firms. The paper explores the links between open innovation and the emergence of a phoenix industry in the UK's traditional automotive heartland. It describes and analyses the results of a series of structured interviews undertaken with firms and other stakeholders in the low carbon vehicles sector in the UK midlands.

An evolutionary view on social innovation and the process of economic change, WWWforEurope Working Paper Series, Issue 43, October 2013

Andreas Reinstaller

Social innovation and social entrepreneurship are concepts that are widely used in the policy discourse. Despite this they are analytically not well defined and very diffuse. The aim of the report is therefore to attempt to clarify these concepts and to work out how social innovation is likely to contribute to social and economic progress in general, and to industrial change more specifically.

The paper provides a brief review of the use of the concept of social innovation in recent years both in the academic and the policy oriented literature. It shows that while the different notions seem to lack a common epistemological basis at first, most definitions relate to some form of autonomous or induced institutional change. These changes then either affect (and possibly improve) the welfare of some specific social groups or of society at large, or lead to the rearrangement of existing or the establishment of entirely new social relationships.

The principal findings of the paper show that there is scope for public intervention to support different types of change agents as considerable social pressure to conform to existing social norms and formal rules will deter potential change agents from becoming active. This problem is likely to be more accentuated in more conservative, conformist societies.

The findings also show that social innovation and social entrepreneurship may not generally be thought of as being a “positive” force for change. On the one hand, social innovation may lead to the diffusion of norms and behaviours that are inferior from a social or economic point of view. On the other hand, social innovation may also increase transaction costs in an economy.

The public sector faces generally a trade-off in supporting social innovation: on the one hand it has to act as a structurally conservative force to ensure social and economic stability. On the other hand, it should allow for enough social variety in order to ensure social and economic progress.

With regard to a potential role social innovation can play in the context of a new industrial policy the paper shows that while social innovation may play an important role to foster the competitiveness of companies there is a limited role for public intervention.

Career choices in academia, WWWforEurope Working Paper Series, Issue 36, August 2013

Jürgen Janger and Klaus Nowotny

Based on a unique survey, we conduct a stated choice experiment to examine the determinants of career choice in academia. Both early and later stage researchers value a balance between teaching and research, appropriate salaries, working with high-quality peers and good availability of external grants. Attractive academic jobs for early stage researchers feature in addition a combination of early independence and career (tenure) perspectives; later stage researchers favour jobs which make it easy to take up new lines of research, which pay according to a public scheme including a performance element and where research funding is

provided by the university. Our findings have important implications for the structure of academic careers and for the organisational design of research universities. Furthermore, they shed light on the institutional determinants of the asymmetric mobility of highly talented scientists between the EU and the U. S.

Academic careers: a cross-country perspective, WWWforEurope Working Paper Series, Issue 37, August 2013

Jürgen Janger, Anna Strauss and David Campbell

Asymmetric international mobility of highly talented scientists is well documented. We try contributing to the explanation of this phenomenon, looking at the “competitiveness” of higher education systems in terms of being able to attract talented scientists in their field. We characterise countries’ capability to offer attractive entry positions into academic careers using the results of a large scale experiment on the determinants of job choice in academia. Examined areas refer to the level of salaries, quality of life, PhD-studies, career perspectives, research organisation, balance between teaching and research, funding and probability of working with high quality peers. Our results indicate that overall, the US research universities offer the most attractive jobs for early stage researchers, consistent with the asymmetric flow of talented scientists to the US. Behind the US is a group of well performing European countries, the Netherlands, Sweden, Switzerland and the UK. Austria and Germany are next, closely followed by France, which in turn is followed by Italy. Spain and Poland are, according to our results, least able to offer attractive entry positions to an academic career.

New empirical findings for international investment in intangible assets, WWWforEurope Working Paper Series, Issue 30, July 2013

Martin Falk

This study empirically analyses the determinants of greenfield investment in intangible assets in emerging and industrialized countries. Data consists of host parent country pairs of greenfield FDI projects in (i) software (except video games), (ii) advertising, public relations and related activities, (iii) headquarters, (iv) research & development and (v) design, development & testing. With a world market share of 33 per cent in 2011 in terms of the number of projects, descriptive statistics show that the EU 27 is one of the most important locations for international greenfield investment in intangible assets. However, there was a decline in the EU 27s share of such projects after the recent financial and economic crisis, which is mainly due to the decrease in intra-EU greenfield FDI activities. In contrast, FDI inflows in intangible assets increased in the United States, in other non EU OECD countries and in emerging countries. Among the EU countries of Ireland, Luxembourg, the United Kingdom, Denmark, Belgium, Netherlands and Sweden are the most attractive locations for Non-EU investors, whereas the southern and East EU countries are least successful in attracting FDI projects in intangible assets. The results using fixed and random effects negative binomial regression models for 40 host and 26 parent countries during the period 2003–2010 show that FDI in intangible assets depends significantly positively on quantity of human capital, quality of human capital measured as the PISA score in

maths and reading, costs of starting a business, broadband penetration, strength of investor protection, R&D endowment and direct R&D subsidies. Wage costs (or unit labour costs) have a significant negative impact on FDI inflows in intangible assets. Other policy factors, such as labour market regulations, product, or FDI regulations, do not have a significant impact. Separate estimates for the EU-27 countries show that corporate taxes matter for the international location decision for intangible assets. The empirical results presented may help to develop a proactive action plan to attract international investments in intangible assets in Europe.

Technology Platforms in Europe: an empirical investigation, WWForEurope Working Paper Series, Issue 34, July 2013

Lisa De Propris and Carlo Corradini

In the last decades, innovation activity has been defined by an increasing complexity and a faster pace of the underlying technological change. Accordingly, several studies have shown that competitive systems of innovation benefit from being able to build upon a wide but integrated spectrum of technological capabilities characterised by a sustained dynamism in the level of inter-sectoral technology flows. In this context, technological platforms – defined as knowledge and scientific launching pads that spin out of key enabling technologies - may create the opportunity for technological externalities to take place across a set of related sectors through a swarm of increasingly applied and incremental innovations. In this report, we look at the presence and determinants of these technological platforms across EU Countries and explore the mechanisms through which these influence inter sectoral technology spillovers, thus fostering technological shifts and technological synthesis within the broader economy. Using data on patents and patent citations obtained from the PATSTAT-CRIOS database, covering all patent applications made to the European Patent Office (EPO), we try to model the systemic nature of technology platforms. In particular, our aim is to provide empirical evidence that the presence of key enabling technologies at the base of the platform may lead to a more sustained interaction across second tier innovations characterised by a “distant” knowledge base. Then, we endeavour to investigate the relationship that may take place between this process and the role played by the national dimension.

Annex 2 – Gender regimes and gender policies in Europe

(Janneke Plantenga)

Table 16 **Employment rate and the employment impact of parenthood, 2012**

Year	2012					
	Employment rate (age 20-64)				Employment Impact of Parenthood (age 20-49)	
	Total	Males	Females	Females -Males	Males	Females
AT	75,6	80,9	70,3	-10,6	-6,9	5,8
BE	67,2	72,7	61,7	-11	-11,3	1
BG	63	65,8	60,2	-5,6	-15,3	14,1
CY	70,2	76,1	64,8	-11,3	-12,1	9,8
CZ	71,5	80,2	62,5	-17,7	-9,2	46,6
DE	76,7	81,8	71,5	-10,3	-7,9	17,8
DK	75,4	78,6	72,2	-6,4	-9,9	2,7
EE	72,1	75,2	69,3	-5,9	-15,3	28,1
EL	55,3	65,3	45,2	-20,1	-17,7	0,8
ES	59,3	64,5	54	-10,5	-13,1	4
EU 28	68,4	74,5	62,3	-12,2	-11,3	10
FI	74	75,5	72,5	-3	-13,7	16,7
FR	69,3	73,8	65	-8,8	-12,4	2,3
HR	55,4	60,6	50,2	-10,4	-20,5	2,4
HU	62,1	68,1	56,4	-11,7	-9,6	37
IE	63,7	68,1	59,4	-8,7	-12,1	11,4
IT	61	71,6	50,5	-21,1	-14,3	4,6
LT	68,5	69,1	67,9	-1,2	-15,9	1,6
LU	71,4	78,5	64,1	-14,4	-5,7	3,9
LV	68,1	70	66,4	-3,6	-10,6	9,9
MT	63,1	79	46,8	-32,2	-10,6	15,1
NL	77,2	82,5	71,9	-10,6	-10,9	2,2
PL	64,7	72	57,5	-14,5	-16	10
PT	66,5	69,9	63,1	-6,8	-14,3	-4,1
RO	63,8	71,4	56,3	-15,1	-8,8	3,3
SE	79,4	81,9	76,8	-5,1	-14,8	-0,1
SK	65,1	72,8	57,3	-15,5	-14,6	38
SL	68,3	71,8	64,6	-7,2	-11,4	2,9
UK	74,2	80	68,4	-11,6	-10,7	13,4

Source: Eurostat (2014)

Table 17 **Fiscal incentive for secondary workers, 2011 – (sorted by AETR)**

Country	Secondary earner (AETR) Primary earner at 100% of AW and 2 children	Single (Net Personal Average Tax)	Ratio (Secondary earner/Single
BE	49,5	35,6	1,4
DK	48,5	36,8	1,3
IS	48,0	23,1	2,1
DE	46,2	34,9	1,3
SI	42,5	28,8	1,5
LV	35,1	29,9	1,2
IT	35,0	26,7	1,3
PL	33,4	23,6	1,4
PT	32,5	17,3	1,9
CZ	31,7	18,9	1,7
NL	30,4	26,8	1,1
LU	30,3	20,5	1,5
AT	30,0	27,3	1,1
SK	29,9	19,4	1,5
HU	29,6	29,5	1,0
NO	29,4	25,6	1,1
FR	29,3	26,1	1,1
IE	29,2	12,8	2,3
LT	27,7	20,0	1,4
RO	27,3	27,6	1,0
UK	24,2	21,7	1,1
EE	24,0	17,7	1,4
ES	23,4	17,7	1,3
FI	22,4	23,1	1,0
SE	22,1	22,1	1,0
MT	21,9	12,6	1,7
BG	21,6	21,6	1,0
EL	21,5	17,2	1,2
Unweighted Average	31,3	23,7	1,4
Unweighted Average without joint taxation countries	30,0	23,1	1,3
Unweighted Average for joint taxation countries (FR, DE, IE, LU, PT)	37,3	26,9	1,4

Source: European Commission (2013); OECD (2013) and OECD (2011)

Table 18 **The generosity of leave within EU member states, 2012**

	Maternity leave in weeks (Within brackets division between pre- and post-natal leave)	Paid Maternity leave (at least 2/3 of salary)	Paternity leave in weeks	Paid paternity Leave (at least 2/3 of salary), in weeks	Parental Leave in weeks	Paid Parental Leave (at least 2/3 of salary), in weeks	Total leave	Total paid leave
AT	16 (8+8)	16	0	0	Until child reaches 2 yrs	51,5 / 60.2	112	76.2
BE	15 (6+9)	15	2	2	34,4	0	51,4	17
BG	58,6 (6+52,8)	58,6	2,1	2,1	Until child reaches 2 yrs	0	112,1	60,7
CZ	28 (6+8+20/22)	28	0	0	Until child reaches 3 yrs	0	162	28
HR	29,7 (4+14)	29,7	0	0	52	34,4	81,7	64,1
CY	18 (4+14)	18	0	0	13	0	31	18
DK	18 (4+14)	18	2	2	Until child reaches 48 weeks of age	32	54	52
EE	20 (4/10+10/16)	20	2	0	Until child reaches 3 yrs	62	164	82
FI	17,5	17,5	3	3	26 (excl. home care allowance)	26	46,5	46,5
FR	16 (>2+14)	16	2	2	Until child reaches 3 yrs	0	164	18
DE	14 (6+8)	14	0	0	Until child reaches 3 yrs	52	162	66
GR	42,8 (8+9)	17	0,4	0,4	34,4	0	77,6	17,4
HU	24 (4+20)	24	1	1	Until child reaches 3 yrs	84	161	109
IE	42 (>2+40)	26	0	0	28	0	70	26
IT	20 (>4+16)	20	0	0	47,3	0	67,3	20
LV	18 (6+12)	18	1,4	1,4	Until child reaches 3 yrs	Until child reaches 1 yrs	163,4	59,4
LT	18 (10+8)	18	4	4	Until child reaches 3 yrs	Until child reaches 1 yrs	170	66
LU	16	16	0	0	52	0	68	16
MT	18 (4+14)	14	0,4	0,4	52	0	70,4	14,4
NL	16 (6+10)	16	0,4	0,4	52	0	68,4	16,4
PL	24	24	2	2	156	0	182	26
PT	6,4	6,4	4	4	45,1	25,8	55,5	36,2
RO	18	18	1	1	Until child reaches 2 yrs	92	111	111
SK	34 (6+28)	34	0	0	Until child reaches 3 yrs	0	162	34
SL	15 (4+11)	15	13	2	37	37	65	54
ES	16 (6+10)	16	2	2	Up to 1 yr is protected, but can be taken until the child reaches 3 yrs	0	164	18
SE	2	2	2	2	Until child reaches 3 yrs	111 (390 days at 80% per parent)	160	115
UK	52 (11+41)	6	2	0	26	0	80	6

	Maternity leave in weeks (Within brackets division between pre- and post-natal leave)	Paid Maternity leave (at least 2/3 of salary)	Paternity leave in weeks	Paid paternity Leave (at least 2/3 of salary), in weeks	Parental Leave in weeks	Paid Parental Leave (at least 2/3 of salary), in weeks	Total leave	Total paid leave
AT	16 (8+8)	16	0	0	Until child reaches 2 yrs	51,5 / 60.2	112	76.2
BE	15 (6+9)	15	2	2	34,4	0	51,4	17
BG	58,6 (6+52,8)	58,6	2,1	2,1	Until child reaches 2 yrs	0	112,1	60,7
CZ	28 (6/8+20/22)	28	0	0	Until child reaches 3 yrs	0	162	28
HR	29,7 (4+14)	29,7	0	0	52	34,4	81,7	64,1
CY	18 (4+14)	18	0	0	13	0	31	18
DK	18 (4+14)	18	2	2	Until child reaches 48 weeks of age	32	54	52
EE	20 (4/10+10/16)	20	2	0	Until child reaches 3 yrs	62	164	82
FI	17,5	17,5	3	3	26 (excl. home care allowance)	26	46,5	46,5
FR	16 (>2+14)	16	2	2	Until child reaches 3 yrs	0	164	18
DE	14 (6+8)	14	0	0	Until child reaches 3 yrs	52	162	66
GR	42,8 (8+9)	17	0,4	0,4	34,4	0	77,6	17,4
HU	24 (4+20)	24	1	1	Until child reaches 3 yrs	84	161	109
IE	42 (>2+40)	26	0	0	28	0	70	26
IT	20 (>4+16)	20	0	0	47,3	0	67,3	20
LV	18 (6+12)	18	1,4	1,4	Until child reaches 3 yrs	Until child reaches 1 yrs	163,4	59,4
LT	18 (10+8)	18	4	4	Until child reaches 3 yrs	Until child reaches 1 yrs	170	66
LU	16	16	0	0	52	0	68	16
MT	18 (4+14)	14	0,4	0,4	52	0	70,4	14,4
NL	16 (6+10)	16	0,4	0,4	52	0	68,4	16,4
PL	24	24	2	2	156	0	182	26
PT	6,4	6,4	4	4	45,1	25,8	55,5	36,2
RO	18	18	1	1	Until child reaches 2 yrs	92	111	111
SK	34 (6+28)	34	0	0	Until child reaches 3 yrs	0	162	34
SL	15 (4+11)	15	13	2	37	37	65	54
ES	16 (6+10)	16	2	2	Up to 1 yr is protected, but can be taken until the child reaches 3 yrs	0	164	18
SE	2	2	2	2	Until child reaches 3 yrs	111 (390 days at 80% per parent)	160	115
UK	52 (11+41)	6	2	0	26	0	80	6

Total (paid) leave is calculated as the sum of the (paid) maternity, paternity and parental leave per household. In order to avoid double counting, post natal (paid) maternity leave is subtracted from (paid) parental leave entitlements if parental leave entitlements are specified until the child x birthday. In case the pre-natal leave entitlement is not given, it is set at 6 weeks.

Source: Own calculation on the basis of Moss (2013); Gauthier (2014) and OECD (family data base), and the Worldbank (Women Business and the Law), ILO pages as well as national websites of several countries.

Table 19 **Percentage of children in formal child care, 2012**

	Below age 3			Between age 3 and compulsory schooling age		
	1-29 hours p/w	30 hours of more p/w	Total	1-29 hours p/w	30 hours of more p/w	Total
EU28	15	15	30	37	46	83
BE	19	20	39	32	66	98
BG	0	7	7	2	58	60
CZ	4	1	5	29	45	74
DK	5	69	74	11	87	98
DE	9	15	24	46	44	90
EE	4	15	19	9	83	92
IE	10	11	21	68	14	82
EL	4	15	19	43	32	75
ES	20	19	39	45	41	86
FR	18	26	44	43	52	95
HR	1	14	15	10	41	51
IT	9	17	26	20	75	95
CY	7	16	23	35	38	73
LV	1	14	15	7	66	73
LT	1	6	7	9	56	65
LU	16	28	44	46	27	73
HU	1	7	8	16	59	75
MT	8	3	11	29	44	73
NL	46	6	52	76	13	89
AT	11	3	14	57	28	85
PL	0	3	3	9	34	43
PT	1	34	35	7	74	81
RO	1	1	2	30	11	41
SI	3	34	37	11	81	92
SK	1	3	4	13	62	75
FI	6	20	26	20	57	77
SE	19	32	51	31	64	95
UK	30	5	35	66	27	93

Source: Eurostat, EU-SILC

Table 20 **Working hours flexibility, 2012**

	Part-time rate (women. 25-54)	Part-time rate (men and women. 20-64)	Share voluntary part-time (% of part-time employment)	Share voluntary part-time (% of total employment)
EU27	31.5	18.6	71.7	13.4
BE	43.3	24.5	90.5	22.2
BG	2.5	2.2	33.6	0.7
CZ	8.5	4.9	80.0	3.9
DK	31.9	20.9	78.9	16.5
DE	45.4	25.7	83.1	21.4
EE	13.0	9.0	79.3	7.1
IE	34.0	22.6	57.6	13.0
EL	11.7	7.5	34.3	2.6
ES	24.3	14.5	38.5	5.6
FR	29.9	17.6	68.6	12.0
HR	7.5	6.2	79.7	4.9
IT	30.9	16.7	41.3	6.9
CY	12.8	9.4	46.5	4.4
LV	10.9	8.8	55.9	4.9
LT	10.6	8.8	66.8	5.9
LU	35.9	18.3	86.0	15.7
HU	9.3	6.6	58.9	3.9
MT	24.8	12.2	84.2	10.2
NL	75.4	46.2	89.9	41.5
AT	45.4	25.4	89.9	22.8
PL	10.3	6.9	71.7	4.9
PT	13.9	10.8	51.7	5.6
RO	9.3	8.8	44.7	3.9
SI	11.8	8.5	90.9	7.7
SK	5.4	3.9	68.2	2.7
FI	17.6	12.7	72.5	9.2
SE	37.2	23.8	71.1	16.9
UK	41.0	24.4	80.4	19.6

Source: Eurostat, EU-SILC

Project Information

Welfare, Wealth and Work for Europe

A European research consortium is working on the analytical foundations for a socio-ecological transition

Abstract

Europe needs change. The financial crisis has exposed long-neglected deficiencies in the present growth path, most visibly in the areas of unemployment and public debt. At the same time, Europe has to cope with new challenges, ranging from globalisation and demographic shifts to new technologies and ecological challenges. Under the title of Welfare, Wealth and Work for Europe – WWWforEurope – a European research consortium is laying the analytical foundation for a new development strategy that will enable a socio-ecological transition to high levels of employment, social inclusion, gender equity and environmental sustainability. The four-year research project within the 7th Framework Programme funded by the European Commission was launched in April 2012. The consortium brings together researchers from 34 scientific institutions in 12 European countries and is coordinated by the Austrian Institute of Economic Research (WIFO). The project coordinator is Karl Aiginger, director of WIFO.

For details on WWWforEurope see: www.foreurope.eu

Contact for information

Kristin Smeral

WWWforEurope – Project Management Office
WIFO – Austrian Institute of Economic Research
Arsenal, Objekt 20
1030 Vienna

wwwforeurope-office@wifo.ac.at

T: +43 1 7982601 332

Domenico Rossetti di Valdalbero

DG Research and Innovation
European Commission

Domenico.Rossetti-di-Valdalbero@ec.europa.eu

Partners

	Austrian Institute of Economic Research	WIFO	Austria
	Budapest Institute	Budapest Institute	Hungary
	Nice Sophia Antipolis University	UNS	France
	Ecologic Institute	Ecologic	Germany
	University of Applied Sciences Jena	FH Jena	Germany
	Free University of Bozen/Bolzano	FUB	Italy
	Institute for Financial and Regional Analyses	GEFRA	Germany
	Goethe University Frankfurt	GUF	Germany
	ICLEI - Local Governments for Sustainability	ICLEI	Germany
	Institute of Economic Research Slovak Academy of Sciences	IER SAVBA	Slovakia
	Kiel Institute for the World Economy	IfW	Germany
	Institute for World Economics, RCERS, HAS	KRTK MTA	Hungary
	KU Leuven	KUL	Belgium
	Mendel University in Brno	MUAF	Czech Republic
	Austrian Institute for Regional Studies and Spatial Planning	OIRG	Austria
	Policy Network	policy network	United Kingdom
	Ratio	Ratio	Sweden
	University of Surrey	SURREY	United Kingdom
	Vienna University of Technology	TU WIEN	Austria
	Universitat Autònoma de Barcelona	UAB	Spain
	Humboldt-Universität zu Berlin	UBER	Germany
	University of Economics in Bratislava	UEB	Slovakia
	Hasselt University	UHASSELT	Belgium
	Alpen-Adria-Universität Klagenfurt	UNI-KLU	Austria
	University of Dundee	UNIVDUN	United Kingdom
	Università Politecnica delle Marche	UNIVPM	Italy
	University of Birmingham	UOB	United Kingdom
	University of Pannonia	UP	Hungary
	Utrecht University	UU	Netherlands
	Vienna University of Economics and Business	WU	Austria
	Centre for European Economic Research	ZEW	Germany
	Coventry University	COVUNI	United Kingdom
	Ivory Tower	IVO	Sweden
	Aston University	ASTON	United Kingdom