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Oei, Pao-Yu; Brauers, Hanna; Herpich, Philipp

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Lessons from Germany's hard coal mining phase-out: policies and transition from 1950 to 2018

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Supplementary Material

1 History of hard coal in Germany

After the Second World War, Germany was divided into West and East Germany. The entire hard coal production was based in West Germany and in underground mines. From 1947, Saarland, the second largest mining region after the Ruhr area, was occupied by the French military regime, which also controlled the coal production. In 1957, Saarland returned to Germany politically and in 1959 economically. The remaining mining areas were Aachen and Ibbenbüren, respectively. Our analysis focuses both on the largest mining area Ruhr area and the Saarland. For West Germany, the domestic hard coal reserves were more than just an energy carrier since it helped to rebuild its industry and enabled it's so called "economic miracle" (Plumpe 2016, 261–62). Furthermore, coal helped to reintegrate (West) Germany into an international union: The European Coal and Steel Community (ECSC), the predecessor of the European Union, was founded in 1951 together with Italy, Belgium, France, Luxemburg and the Netherlands.

After the end of the war, the price for domestic coal was fixed to a comparatively low level in order to facilitate the reconstruction of Germany. In 1956, the ECSC forced Germany to free the price and implement a market based system for the German coal price (Nonn 2009, 97–98). This liberation of the energy sector combined with the end of the Suez crisis led to cheap import oil gaining significance and to a declining hard coal demand. This was the beginning of the 1958 coal crisis. Additional to the substitution by oil, domestic coal was increasingly under pressure by comparably cheap foreign hard coal. The coal and steel industry (in German 'Montanindustrie') formed a powerful network together with influential unions and politicians (especially the social democratic party), protecting domestic coal production. At this time, coal did not only have regional significance for workers and the economy but guaranteed security of supply of energy which made it a strategic good. Hence, and to prevent structural disruptions, the German hard coal sector received subsidies to balance the price gap between domestic and imported coal since 1968. Since 1964, the prices for domestic coal exceeded the ones of imported coal (Verein der Kohleimporteure e.V. 2017, 111).

Hard coal was responsible for more than 70% of West Germany´s primary energy consumption (PEC) in 1950 (2.9 TJ).[1] In the following, hard coal was increasingly substituted both in absolute and relative terms: Before the reunification mainly with imported mineral oil, natural gas, and nuclear power, and after the reunification also renewable energy. Coal's share decreased to 19% of PEC in 1990 and 11% in 2017. From 1950 onwards Germany's PEC increased, to almost 13.6 TJ in 2017 (AG Energiebilanzen 2018).

Hard coal consumption in the electricity sector of West Germany reached its highest share with over 60% at the end of the 1950s, was ~30% at the time of reunification and ~15% for Germany in 2017 (AGEB 2018). Gross electricity generation (GEG) in West Germany increased from 44 TWh in 1950 to

[1] AG Energiebilanzen e.V. 2017a. 'Zeitreihen bis 1989'. 2017. https://ag-energiebilanzen.de/12-0-Zeitreihen-bis-1989.html.

450 TWh by 1990.[2] Germany's GEG in 2017 was almost 655 TWh.[3] For a more detailed description see Herpich, Brauers, and Oei (2018).

Besides the increasing amount of imported energy carriers, the ongoing mechanization of the mining sector led to a lower employment which had an additional impact on the total number of employees in the two mining regions. At the peak, right before the coal crisis in 1958, over 600,000 people were employed. Until 1968, 320,000 people lost their job. The development of employment in hard coal mining as well as produced and imported hard coal is depicted in Figure 5.

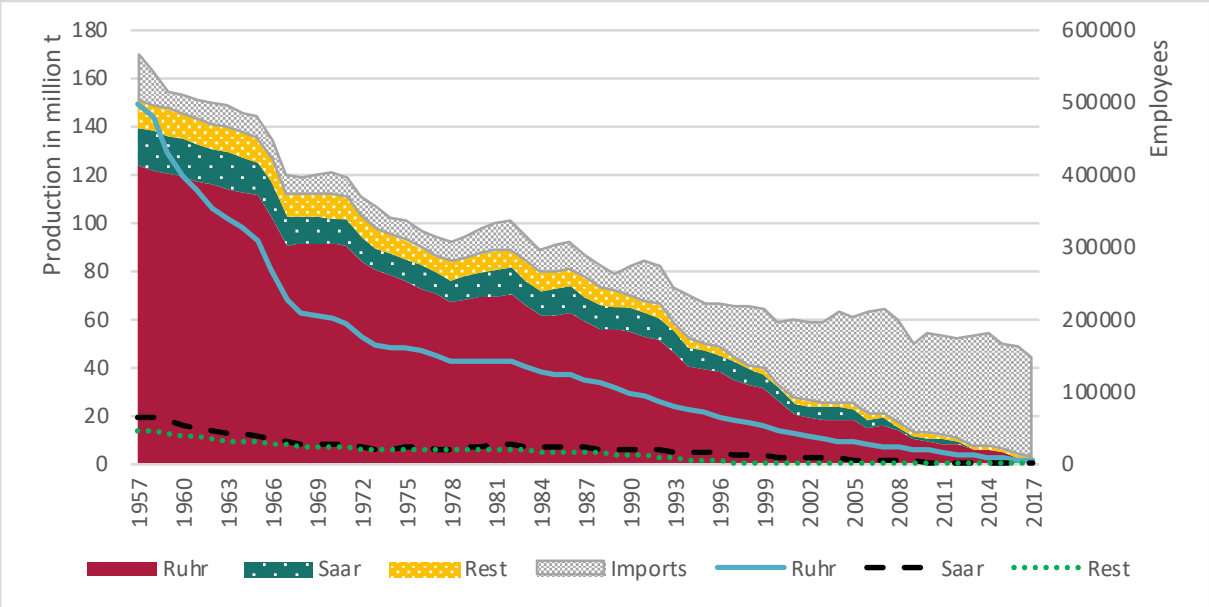

Figure 5: Domestic hard coal production, imports and employees (mining only) of West Germany

Note: Production is displayed as stacked areas, employment as independent lines

Source: Own calculations based on Statistik der Kohlenwirtschaft (2018a, 2018b) and Verein der Kohleimporteure (2018, 2017).[4]

Due to the coal and steel industry, the NRW became the country with the highest population. The industry concentrates on the Ruhr area. The Ruhr area is still the most densely populated area in Germany – until today. In the Saarland the industries gather in the south. Both mining regions depended strongly on the economic circumstances of this industry and suffered repeatedly of high unemployment rates over the years. Total unemployment in West Germany fell from around 1.9 million in 1950 to just

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[2] Statistik der Kohlenwirtschaft e.V. 2017. 'Bruttostromerzeugung'. Download. 2017. https://kohlenstatistik.de/17-0-Deutschland.html.

[3] AG Energiebilanzen. 2018a. „Bruttostromerzeugung in Deutschland ab 1990 nach Energieträgern". https://ag-energiebilanzen.de/index.php?article_id=29&fileName=20171221_brd_stromerzeugung1990-2017.pdf.

[4] Statistik der Kohlenwirtschaft e.V. 2018a. 'Steinkohle'. Statistik der Kohlenwirtschaft. 2018. http://www.kohlenstatistik.de/18-0-Steinkohle.html, Statistik der Kohlenwirtschaft e.V. 2018b. 'Steinkohle - Belegschaft im Steinkohlebergbau'. Steinkohle. 2018. https://kohlenstatistik.de/18-0-Steinkohle.html, Verein der Kohleimporteure e.V. 2017. 'Jahresbericht 2017 - Fakten und Trends 16/17'. Hamburg, Germany. http://www.kohlenimporteure.de/publikationen/jahresbericht-2017.html and Verein der Kohleimporteure e.V. 2017. 'Jahresbericht 2017 - Fakten und Trends 16/17'. Hamburg, Germany. http://www.kohlenimporteure.de/publikationen/jahresbericht-2018.html.

150,000 in 1962.[5] The rising development of the metal industry was able to cover most of the job losses in the mining sector in NRW (Nonn 2001, 179f). The Saarland profited from an emerging automotive industry. Yet, in the following years, the "economic miracle" ended and the mining regions as well as Germany as a whole suffered from global macroeconomic changes like the oil crises in 1973 and 1979. The induced economic recessions led to a doubling of the unemployment rates in the Ruhr area (see also Figure 2) within only a few years (1973: 1.6% → 1974: 3.3% and 1979: 5% → 1982: 10.3%). A first peak in unemployment was reached with 15.1% in 1987, which dropped to around 10% in the early 90s. In 2005, a new maximum was reached with 16.4%. In the past 10 years, the region's average unemployment rate equates to approximately 11%. The development of the unemployment figures corresponded with the trends of NRW and the rest of Germany; however, unemployment rates of the Ruhr area were always higher. The gap widened especially in the 1980s, where they were between 5 and 7% higher than the West German average. The gap was reduced to only about 2% in 2002 and remains at a level between 4 and 5% since 2010.[6] The Saarland's variation of the unemployment rate was similar to the Ruhr area's during the oil crises but was constantly above it (1973: 1.9% → 1976: 6.7% and 1979: 6.5% → 1983: 11.8). In the late 1990´s, the unemployment of the Saarland started to develop better than the rest of Germany, and is currently at around 8% (which is close to the federal level, see Figure 2).

2 Political instruments since the 1950s until today

Looking at both regions' unemployment rates, especially in recent years, shows that the transition in the Saarland seemed to have a more positive effect on development. The following section analyses the pathways of the two case study regions including the implemented measures and policies, in order to derive possible explanations for the different developments. Both regions strongly relied on coal as well as steel production. Hence, the (socio-)economic crises in the affected regions as well as the implemented measures cannot simply be attributed to the coal sector alone.

2.1 Coal crises and first structural policy programs in the 1950s and 60s

The whole reduction and transition process in Germany was highly influenced by the "coal and steel co-determination law" ("Montanmitbestimmungsgesetz") from 1951, giving the employee-side equal number of votes in executive boards. All measures that were implemented within the companies along the decline in production were agreed on by the workers. This law did not account for the Saarland from the beginning, since it was independent from Germany and occupied by the French military regime. When the Saarland was returned to West Germany in 1957, the Saarbergwerke AG was founded (state company owned to 74% by West Germany and 26% by Saarland) (Roos 2007, 101). As a first response to the coal crisis in 1958, shifts were shortened and employees entered early retirement, financially

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[5] Bundesagentur für Arbeit. 2018. 'Arbeitslose und Unterbeschäftigung - Deutschland und West/Ost (Zeitreihe Monats- und Jahreszahlen ab 1950)'. Bundesagentur für Arbeit - Statistik. 19 February 2018. https://statistik.arbeitsagentur.de/nn_31892/SiteGlobals/Forms/Rubrikensuche/Rubrikensuche_Form.html?view=processForm&resourceId=210368&input_=&pageLocale=de&topicId=17722&year_month=aktuell&year_month.GROUP=1&search=Suchen.

[6] Regionalverband Ruhr. 2017c. 'Arbeitsmarkt'. 2 October 2017. http://www.metropoleruhr.de/fileadmin/user_upload/metropoleruhr.de/01_PDFs/Regionalverband/Regionalstatistik/Arbeit_und_Soziales/Arbeitsmarkt/2015_Zeitreihe_Arbeitsmarkt.pdf.

supported by the state (Farrenkopf 2009, 81, 94). In the short-term, these measures were able to alleviate negative consequences for affected workers, however, between 1957 and 1967, over 300,000 out of 600,000 workers lost their job in hard coal production (~267,000 in the Ruhr area and ~23,400 in the Saarland). The first years of the reduction in coal production due to the oil crisis overlapped with the last years of the "economic miracle" in Germany. The majority of the workers were therefore able to transfer into other jobs, mainly in the metal industry (Nonn 2001, 179f). Thus, unemployment payments were only necessary for workers close to their retirement.

In order to be able to control the decline of coal production, mining companies in the Ruhr area were forced to combine their production in a newly founded company called RAG AG (Goch 2009, 128). In the Saarland, hard coal was already produced almost entirely by the Saarbergwerke AG, but the production sites were connected in order to increase their productivity. Additionally, in 1968, the German coal sector concluded sale contracts with the energy and steel sector. These contracts included state subsidies, paying the price difference between domestic and imported hard coal, to enable a structured and slowed down decline in coal production and related employment.

In the same year, the structural policy program "Development Program Ruhr" was launched with a volume of Deutsche Mark (DM) 17 billion (€8.7 billion)[7] (Goch 2009, 146). The government of NRW acknowledged the need for an economic reorientation as domestic coal production kept declining and unemployment rose. Hence, it bundled hitherto individual and isolated measures in this structural program which intended to attract new enterprises from other sectors. The influential mining and steel companies opposed these plans by not providing the land they owned to new coming companies as they feared losing qualified workers and increasing wage levels in the region (called "ground lock", "Bodensperre").

Another objective of this program was to improve education and traffic infrastructure to enable the economic reorientation (Goch 2009, 146). Previously, there existed no university in the area. Furthermore, historically cities grew around the mining and steel industry, so that homes of workers were in close distance to their workplaces. Connections between neighboring cities needed to be improved in order to enable the citizens to accept alternative jobs in a wider area (Bogumil et al. 2012, 15).

After the reintegration into Germany, the Saarland faced additional challenges: Due to the special status as occupied state, the Saarland was not considered by the payments granted by the Marshal plan and needed state aid between 1956 and 1961 of DM2.8 billion (€1.4 billion) of which DM500 million (€ 256 million) were spent on economic and industrial policies (Anderson 2007, 148). At this time, the Saarland highly depended on coal and steel production, with 36% of total workforce in mining and 43% in the metal industry in 1957 (Anderson 2007, 145). Thus, when the coal crisis started, the federal efforts went into supporting especially the coal industry to alleviate social problems but with the effect of conserving

[7] If not stated otherwise the values in this paper are in nominal terms in the respective currency.

structural weaknesses in the economy (Dörrenbächer, Bierbrauer, and Brücher 1988, 209). Regardless of political measures, between 1960 and 1970 jobs in mining declined from 53,000 to below 27,000.[8]

Similar to the Ruhr area, the highway system in the Saarland was extended in the early 1960's (Fläschner and Hunsicker 2007, 86). The Saarland followed a strategy to structure the decline in hard coal production and simultaneously diversify the economic activity of the Saarbergwerke AG in the mid-1960s (including oil and refining, chemical industry and construction of coal-fired power plants) (Marx 2014, 260–62). The efforts lacked a broader strategy, which is why the projects were not sustainable and failed (Roos 2007, 104). During the recession between 1966 and 1968, the Saarland was hit exceptionally hard compared to the rest of Germany – every 10th job in manufacturing was lost (in the rest of West Germany every 14th) (Anderson 2007, 150). On the one hand, this was a result from the neglection by the Marshall plan, on the other hand from overcapacities that developed under the French occupation when the production focused on the French market (Dörrenbächer, Bierbrauer, and Brücher 1988, 209). Therefore, in 1969, the "Structural Program Saar" was implemented with the goal to achieve full employment by creating 50,000 jobs and overcome the differences between the regional and federal economic development. The strategy contained elements to strengthen the coal and steel sector as well as to increase the employment in other growth sectors. One element was to extend the riverbed of the river Saar, in order to enable the transportation of bulk goods for the coal and steel industry (Anderson 2007, 150).

At the same time, the individual mass motorization took place in Germany and car manufacturers and suppliers were eager to enter and expand into the European market (Fläschner and Hunsicker 2007, 89). The Saarland had the right circumstances for car manufacturers as it was able to provide qualified workers from the mining and steel industry and sufficient space for new companies was made available (Giersch 2007, 134). In the Saarland, the mining companies only received set-aside premiums for producing less coal if they offered their real estates for new commercial usage. The resistance against new companies might additionally have been lower compared to the Ruhr area, since the mining company that produced almost the total amount of coal in the Saarland, was in public ownership.

The "Structural Program Saar" (later transferred into the "Action Program Saarland-Westpfalz") was designed for 5 years with a volume of DM40 million (€20.5 million) (Anderson 2007, 153). The Saarland granted companies tax cuts, low interest rates and premiums (Evenhuis 2016, 164). Due to these benefits and the close distance to the car manufacturers in South Germany, suppliers and manufacturers (e.g. FORD) settled in the Saarland. Between 1960 and 1972 around 140 companies settled in the Saarland, most of them in the last 5 years (Giersch 2007, 133). In total, around 40,000 new jobs were created, 25,000 of those in newly settled companies (Anderson 2007, 153). As a consequence, gross GDP rose up to a quarter between 1970 and 1975 and the wage level of Saarland assimilated to the average West German level. Due to this boom, in the end of the 1960s and early 1970s, the „Structural Program Saar" proved to be very successful (Dörrenbächer, Bierbrauer, and Brücher 1988, 209; IHK Saarland 1976, 15f).

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[8] Statistik der Kohlenwirtschaft e.V. 2017. 'Steinkohle - Belegschaft im Steinkohlebergbau'. Steinkohle. 2017. https://kohlenstatistik.de/18-0-Steinkohle.html.

2.2 The oil & steel crises and resulting industrialization policies in the 1970s

The strategy of economic reorientation failed in the Ruhr area and unemployment increased significantly from 12,000 in 1970 to almost 100,000 in 1976.[9] The economic miracle ended and the "ground lock" prevented new companies from settling. In the following, the new approach was to strengthen the local potential by modernizing the *existing* industries (coal, steel and energy) with investments of DM2 billion (€1 billion) in total (Goch 2009, 150). The investments into the coal and energy sector were partly driven by the hope of a renaissance of coal after the first oil crisis in 1973. The situation in the Ruhr area further aggravated with also led to the steel industry crisis of 1974. One of the largest consumers of domestic hard coal had reached its peak and was not able to recover. Politicians realized the structural nature of this crisis and demanded adjustments on the production level.

After the second oil crisis in 1979, unemployment further increased and problems associated with the high sectoral specialization of the coal and steel regions became obvious. Between 1980 and 1984 the structural policy program "Action Program Ruhr" was implemented in order to initiate the economic reorientation of the Ruhr area and the establishment of new industries. The program created incentives for technology transfers between universities and companies. Additionally, the program intended to develop the tertiary sector in the Ruhr area. It connected individual measures in different fields such as technology, innovation support, ecology, culture and the labor market and was supposed to coordinate the numerous measures by the federal government, the state and the municipalities. The program with a volume of DM6.9 billion (€3.5 billion) followed a new principle that emphasized the participation of regional stakeholders in order to lower their resistance in the transformation process (Goch 2009, 152).

As part of the program, the "state development society" ("Landesentwicklungsgesellschaft") and the property fund Ruhr were implemented to buy and restore former industrial sites. This measure ended the "ground lock" and, hence, was able to overcome a major barrier against economic reorientation. [10] Thanks to the "Action Program Ruhr" several new technology centers were created and the soft location factors (e.g. improving the regional image, more cultural activities, etc.) improved. Nevertheless, similar to previous programs it did not succeed in diversifying the economy. One reason for that was the large investment into the modernization programs of the *existing* industries.

The steel crisis hit the Saarland as well in 1973/74, resulting in an increase of the unemployment rate and 60% of the 54,000 workers in the steel industry lost their jobs within 20 years (Lerch and Simon 2011, 30). At this time, the Saarland had difficulties to attract further industries and companies due to currency disparities and a shift of production to countries with lower wage levels (Dörrenbächer, Bierbrauer, and Brücher 1988, 209). Thus, the idea was to strengthen or at least stabilize the employment by creating high quality jobs (Dörrenbächer, Bierbrauer, and Brücher 1988, 209). Like in the Ruhr area, the first oil crisis lighted up the hope of a revitalization of the coal industry and the

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[9] Regionalverband Ruhr. 2017c. 'Arbeitsmarkt'. 2 October 2017. http://www.metropoleruhr.de/fileadmin/user_upload/metropoleruhr.de/01_PDFs/Regionalverband/Regionalstatistik/Arbeit_und_Soziales/Arbeitsmarkt/2015_Zeitreihe_Arbeitsmarkt.pdf.

[10] metropoleruhr. 2010. 'Bodensperre'. Regionalkunde Ruhr. 2010. http://www.ruhrgebiet-regionalkunde.de/html/aufstieg_und_rueckzug_der_montanindustrie/huerden_des_strukturellen_wandels/bodensperre.php%3Fp=4,1.html.

production rose. After the second oil crisis, the hard coal production rose even further and reached the highest productivity in Europe (Dörrenbächer, Bierbrauer, and Brücher 1988, 213). The Saarland, despite being considerably smaller, spend twice as much as in the Ruhr area on research of alternative coal usages.

Between 1978 and 1981, the Saarland received around DM180 million (€92 million) via the special steel program of the GRW[11] (Nägele 1996, 101). With high state aids, the diversification of the Saarbergwerke was supposed to help creating high quality jobs (Dörrenbächer, Bierbrauer, and Brücher 1988, 213). Similar to the Ruhr area, the Saarland tried during this time to conserve the old structures. One the one hand, this can be interpreted as some kind of social instrument as it slowed down the decrease in employment but on the other hand this measures can be seen as intervention which delayed necessary structural change (Otto and Schanne 2006). An important factor throughout the crises were the close ties of the up- and down-stream industries of the automotive industry (Georgi and Giersch 1977). Due to these ties, many companies stayed within the region regardless of the crisis. Additionally, the ongoing incentives for investments proved to be helpful for the expansion of existing industries (Giersch 2007).

2.3 Regionalization of the structural policy since the mid-1980s

Policymakers had realized that there was no single industry likely to replace the steel and coal sector in a way so that it could stabilize the Ruhr area's economy alone. Previous programs did not take the individual strengths and weaknesses of cities into account. The new more regionalized approach to structural policy included regionally planned development strategies, conducting individual strengths and weaknesses analyses of cities and regions (Goch 2009, 156). After the second oil crisis in 1979, the unemployment rate almost tripled within 6 years to 14.2% – compared to a rate of 8.7% in the rest of the country.[12] The NRW state government implemented the so-called "Commission for Coal and Steel Regions" (Komission Montanregionen) which included regional stakeholders in the process of developing strategies. In 1987, the program "Future Initiative Coal and Steel Regions" (Zukunftsinitiative Montanregionen) with a volume of DM2 billion (€1.0 billion) was launched. Innovation and technology funding, education of workers, infrastructure and improvement of the environment as well as energy matters were announced as important fields of development. In order to receive funding, the regions now had to submit projects themselves, which were developed together with regional stakeholders such as the chamber of crafts, unions or environmental organizations.

The "International Building Exhibition Emscher Park" project from 1989 to 1999 is another example for consent-based regionalized policy. 120 small projects were combined, mostly targeting the improvement of soft location factors in order to create a new identity of the Ruhr area. These projects with a total budget of DM5 billion (€2.6 billion) included measures to implement an underground sewage system, cultural and touristic projects, 17 technology centers and the remediation of mining damages (Goch

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[11] The GRW („common task for improving the regional economy") is the cohesion and exchange scheme between the states in Germany. It was founded in 1969 and concentrates on structurally weak regions.

[12] Regionalverband Ruhr. 2017c. 'Arbeitsmarkt'. October 2, 2017. http://www.metropoleruhr.de/fileadmin/user_upload/metropoleruhr.de/01_PDFs/Regionalverband/Regionalstatistik/Arbeit_und_Soziales/Arbeitsmarkt/2015_Zeitreihe_Arbeitsmarkt.pdf.

2009, 162). It opened up new spaced both for people and nature and improved quality of living in the region.

Several universities and research institutions as well as an image beyond mining and steel was created by these structural policy programs. Although that improved the attractiveness of the region, only a limited number of new companies, and hence employment opportunities, was attracted into the Ruhr area. Most financial support by the state was still focused on protecting the coal and streel industry as a powerful network of the related companies, unions and politicians resisted more rapid changes.

In the Saarland, decision makers realized that despite the oil crises hard coal as well as steel production would not recover. One major problem of these industries were the high dependence on global economic events and that resulting crises were detrimental for the economy. Hence, the original plans to further expand the coal sector was given up in 1982 (Roos 2007, 106). The demand for coal in the energy sector decreased due to further deployment of nuclear power and also the demand in the steel sector shrunk due to the shift of production to other countries and replacement of steel by aluminum and plastics (Dörrenbächer, Bierbrauer, and Brücher 1988, 214f). The support for the steel sector impacted the public household of the Saarland - between 1980 and 1985, DM1.5 billion (€0.8 billion) were spent on steel sector support. The state and federal spending on regional policy equaled to DM770 million (€ 394 million) during this time (Anderson 2007, 155). Unemployment was the highest of all states in Saarland at this time. Nevertheless, support via the GRW for the Saarland was cut. Therefore, in 1983, the Saarland launched its own program with a volume of almost DM39 million (€20 million) which mimicked the measures of the GRW by aiming at business attraction and investment support (Anderson 2007, 157).

In addition, the Saarland government addressed the predecessor of the EU for financial support and consequently received funding via the RESIDER and RECHAR programs for coal and steel regions. Funds were granted for redevelopment of the environment, restauration of former industrial sites as well as reeducation programs for worker in the affected regions (Evenhuis 2016, 168)[13].

At the end of the 1990s, the Saarland followed a new path and founded research facilities connected to IT, bio- & nano-technology as well as medicine in order to develop an innovation intense and growth orientated economy (Lerch 2007, 128). The IT research facilities were the only ones affecting the labour market. The main reason for failure in the other sectors were limited independency or responsibility of the subsidiary companies of globally acting corporations that were settled in the Saarland. The possibility to create a cooperation between research and production leading to the development of new products was therefore limited (Otto and Schanne 2006, 135; Lerch 2007, 128).

2.4 EU´s growing influence and end of subsidies for domestic hard coal production in the 2000s

In 1997, the Saar government sold the Saarbergwerke AG to the RAG AG as part of the coal compromise between the federal government and the mining states. Therefore, the Saarland received

[13] European Commission. 1997. 'Kommission gewährt 6,2 Mio. ECU für RECHAR-II-Programm im Saarland'. Cordis: Forschungs- & Entwicklungsinformationsdienst Der Gemeinschaft. 24 July 1997. https://cordis.europa.eu/news/rcn/5387_de.html.

additional financial resources to deal with the expected reduction of another 12,000 jobs. At this time, the economic development in the Ruhr area and Saarland increasingly focused on the technological development and innovation, and support for entrepreneurship and start-ups (Evenhuis 2016, 169). Research centers were founded and extended; start-ups were granted financial support and received consulting from institutions that intended to ease the technology transfer between businesses and research facilities. Around the turn of the millennium, the growing influence of the EU and its shifted objective from erasing regional disparities towards economic growth emphasized the support of so called clusters, meaning networks of institutions, companies and research facilities operation in promising economic sectors (Lageman and Schmidt 2007).

In 2007, the EU´s competition regulations forced Germany to implement a law to end the coal subsidies until 2018. A total volume of around €289 to 331 billion from 1950 to 2008[14] was spend on hard coal (Meyer, Küchle, and Hölzinger 2010, 10). The annual costs for the sale subsidies for hard coal exceeded the average salary of a coal mining employee at this time. The costs increased from €13,500 in 1980 to €75,000 in 2005 (Frigelj 2009, 230).

When the end date for the subsidies was negotiated, measures to ensure social security for workers were one of the focus points. Every person formerly employed in hard coal production entered retirement, got other social benefits or a new job ("Steinkohlefinanzierungsgesetz"). During the hearings in 2007, the mining industry, unions and social democrats pleaded for 2018 as the production end date. Their main arguments were the "social compatibility" for workers and necessary adjustment time for the entire Ruhr area. The year 2012 was also discusses as possible end year. The IG BCE union stated that 11,000 employees would then lose their job, while research facilities like University Duisburg-Essen and the Leibniz Institute for Economic Research (RWI) stated that this could have avoided €4-10 billion in mining damages and subsidies. These funds could have been used to reeducate former employees, with up to almost €1 million per worker to create a "socially compatible" phase-out (Frigelj 2009, 229–30).

The end date of coal mining subsidies was eventually set to 2018, also thanks to the powerful network of unions, the mining industry and the social democrats. In the Saarland, the end date was initially planned to be 2014, but as the region suffered from mining related earthquakes, the fear of further damages rose and mining ended in 2012 (Hartmann 2018, 316). The remaining workers were transferred to the coal mining area at Ibbenbüren. Every worker with the age of 42 or older was secured by law against unemployment. After the end of their employment in coal mines, workers would work three years in decommissioning and then receive payments for 5 years to bridge the time until they enter the regular pension fund at age 62 in 2027 (Frigelj 2009, 229). The federal parliament estimated the total costs for the phase-out period from 2006 to 2018 at around €38 billion.[15] Additionally, the parliament estimated around €2 billion for pensions and mining damages and additional €7 billion for the so-called eternity costs after 2018 (Frigelj 2009, 214).

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[14] In real terms in 2008 €. Upper value includes financial support (direct and tax breaks), benefits in the emissions trade system and the costs of higher electricity prices through incomplete competition in the electricity sector.

[15] Bundesregierung. 2007. 'Drucksache 557/07 des Deutschen Bundestages - Gesetzesentwurf zur Finanzierung der Beendigung des subventionierten Steinkohlenbergbaus zum Jahr 2018'.