

Seyfang, Gill

**Working Paper**

## Carbon currencies: A new gold standard for sustainable consumption?

CSERGE Working Paper EDM, No. 09-07

**Provided in Cooperation with:**

The Centre for Social and Economic Research on the Global Environment (CSERGE), University of East Anglia

*Suggested Citation:* Seyfang, Gill (2009) : Carbon currencies: A new gold standard for sustainable consumption?, CSERGE Working Paper EDM, No. 09-07, University of East Anglia, The Centre for Social and Economic Research on the Global Environment (CSERGE), Norwich

This Version is available at:

<https://hdl.handle.net/10419/48817>

**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.*

**Carbon currencies:  
A new gold standard for sustainable  
consumption?**

by

Gill Seyfang

**CSERGE Working Paper EDM 09-07**

**CARBON CURRENCIES:  
A NEW GOLD STANDARD FOR SUSTAINABLE CONSUMPTION?**

**Gill Seyfang**

**Centre for Social and Economic Research on the Global Environment  
School of Environmental Sciences  
University of East Anglia  
Norwich NR4 7TJ, UK.**

**[g.seyfang@uea.ac.uk](mailto:g.seyfang@uea.ac.uk)**

**ISSN 0967-8875**

## **Abstract**

Sustainable consumption demands radical changes to the socio-economic and socio-technical systems of provision in society, in order to realign development goals towards quality of life rather than material consumption. Complementary currencies (CCs – parallel media of exchange which run alongside mainstream money) have been proposed as new tools to achieve these goals. This paper reviews experience with CCs, along with an untested CC policy proposal known as Personal Carbon Trading (PCT), which proposes to issue carbon currency to all UK citizens, with the aim of limiting and reducing carbon emissions. However, the lack of empirical experience with PCT hinders its development. This paper makes the novel conceptual link between CCs and PCT, in order to inform its development. The following factors are significant in influencing their character, impacts and outcomes: policy coherence; social contexts and cultures; technologies; skills and capabilities; and finally, the extent to which the CCs enlist and engage with active citizenship. Hitherto neglected social and political factors are significant influences on the development and success or otherwise of CCs, and by definition, PCT. While much PCT literature approaches it as a utilitarian market system, this analysis suggests that PCT should instead be approached as a socially-embedded collective endeavour, as ‘ecological citizenship’ rather than ‘ecological modernisation’

## **Keywords**

carbon emissions, carbon allowances, environmental governance, climate change, degrowth, ecological citizenship

## **Acknowledgements**

This research was funded by the UK’s Economic and Social Research Council as part of CSERGE’s Programme on Environmental Decision-Making and an RCUK Academic Fellowship on Low-Carbon Lifestyles. Thanks to Irene Lorenzoni, Lorraine Whitmarsh, Saffron O’Neill, Jackie Burgess, Mike Nye and Tom Hargreaves for discussions which led to some of the ideas in here, and for helpful comments on previous versions of the text. Any errors or omissions are the author’s sole responsibility.

## 1. INTRODUCTION

The need to devise and embed more sustainable patterns of consumption in developed countries is now increasingly recognised as a foundation of sustainable development policy, and in particular, policies aimed at tackling the challenges of climate change. It is increasingly recognised that current consumption and consumer lifestyles, and policy instruments, are incompatible with ambitious targets to reduce greenhouse gas emissions at a scale and speed severe enough to attempt to mitigate the worst impacts of climate change (DEFRA, 2003). The UK's Climate Change Bill commits the government to achieving 80% cuts in carbon dioxide emissions by 2050, compared with 1990 (HMG, 2008), but the household sector continues to increase its CO<sub>2</sub> emissions (ONS, 2004): households' direct energy use amounts to 40% of the UK's emissions (Carbon Trust, 2006). Triggering the required shifts in individual behaviour has proven more challenging than anticipated, and carbon mitigation efforts must begin to engage with households and individuals in new ways, to achieve these goals.

Existing work on sustainable consumption has raised several key issues pertinent to this debate. First, a growing critique of mainstream 'ecological modernisation'-based sustainability policies highlights the limited scope and potential of market-based regulation, and voluntary, individualistic efforts at changing behaviour (Young, 2000; Jackson, 2009). Furthermore, beyond basic necessities, growth in consumption is not matched by increases in well-being or happiness (Max-Neef, 1992). Instead, a 'new economics' alternative vision of sustainable consumption is proposed which directs development towards '*degrowth*' goals of improving wellbeing and quality of life, rather than material consumption and economic growth *per se* (Ekins, 1986; Seyfang, 2009; Jackson, 2009). This position is founded on 'ecological citizenship', a moral obligation to promote inter- and intragenerational equity in terms of global share of resource use (visualised through the ecological footprint metaphor), through both public and private actions (Dobson, 2003). Second, a sociological critique of mainstream sustainable consumption suggests that the economic, rational-actor model misses many of the key factors in consumption decision-making: namely, habit, routine, peer pressure, need for self-expression, identity, self-esteem, belongingness, and so on, not to mention the more structured institutions and socio-technical infrastructures which shape the choices available (Jackson, 2006; Shove, 2003; van Vliet *et al.*, 2005). For example systems of transport provision often do not offer realistic public transport options, locking individuals into private car use. Attending to these wider social structures and forces prompts a consideration of collective action around carbon reduction, to re-shape the infrastructures of consumption.

These critiques therefore suggest that sustainable consumption requires a radical realignment of social and economic institutions and systems of provision, to reduce material consumption while improving wellbeing. Experimental initiatives to address these problems are emerging around the world, in innovative green niches where alternative values and visions are enacted, with the potential to grow and diffuse into wider society (Seyfang and Smith, 2007; Seyfang, 2009). One such system is that of exchange, which is addressed by 'complementary currencies'. These are a new tool for sustainable consumption, which shift consumption behaviour towards more localised, inclusive and community-focussed patterns, with lower ecological footprints, and associated reductions in CO<sub>2</sub> emissions (Seyfang, 2006, 2010). They are systems of exchange which operate alongside conventional money, and which aim to fulfil some of the social, economic and environmental needs which conventional markets and money currently neglect. This paper briefly reviews experience with complementary currencies as a tool for sustainable consumption, in order to offer a novel context for the investigation of proposals (made by climate change academics and activists,

and increasingly being considered by the UK government) for a new nationwide and mandatory *mainstream* complementary currency and policy tool, intended to change behaviour and address climate change, namely *personal carbon trading*. Given the lack of empirical experience with PCT, this paper makes the first conceptual link between PCT and complementary currencies (CCs), to draw lessons for PCT on successful implementation, and to consider its role and potential in reducing carbon emissions, and contributing to sustainable consumption and ecological citizenship more generally. It furthermore offers some pre-emptive advice on the challenges and opportunities that might be faced were this policy tool to be implemented.

## 2. EXPERIENCE WITH COMPLEMENTARY CURRENCIES

Faced with the challenge of forging new social institutions and systems of provision to deliver sustainable consumption, 'complementary currencies' (CCs) have been proposed as a potentially useful tool. These are new systems of exchange which operate alongside conventional money, facilitating the exchange of goods and services in a parallel market, where alternative rules and resources prevail, and have been rapidly growing in number since the 1990s in developed and developing countries. They include mainstream commercial schemes (air miles, supermarket loyalty points), and community-based initiatives for economic development, social justice and environmental protection (Local Exchange Trading Schemes (LETS), Time Banks) (DeMeulenaere, 2008; Seyfang, 2006, 2010). Clearly, while some are specifically environmental in purpose, they do not all aim to encourage sustainable consumption; some are marketing tools to promote business activity and increase consumption. But what these very different types of initiative have in common is that they are principally media of exchange, voluntarily accepted in exchange for goods and services.

The conventional definition of money describes a tool which serves three economic purposes: as a medium of exchange, a store of value, and a unit of account (Lipsey and Harbury, 1992). However, money need not serve all these (potentially conflicting) functions in one form (Boyle, 2002), and it is only in recent times that these functions have been combined within a single monetary instrument, known as general purpose money. Complementary currencies tend to fulfil one or other of money's functions to the exclusion of others (for instance offering a medium of exchange which is incentivised to encourage circulation) and can be regarded as 'limited purpose' or 'special money' with particular distinguishing socio-technical meanings which will influence its use (Dodd, 1994; Zelizer, 1994; Seyfang, 2000). They can operate with notes and coins, smartcards, or through telephone conversations and slips of paper (Greco 2001; Lietaer, 2001)

Money is therefore a social construction, and its design imbues it with particular behavioural incentives: "Money matters. The way money is created and administered in a given society makes a deep impression on values and relationships within that society. More specifically, the *type* of currency used in a society encourages – or discourages – specific emotions or behaviour patterns" (Lietaer, 2001: 4). Mainstream money (as a means of exchange within current market economies) is not a value-free, neutral technology: it has characteristics which incentivise unsustainability: it values some types of labour and not others, values scarcity (encouraging exploitation of abundant goods such as ecosystem services), promotes competition, and externalises certain costs. In contrast, community-based (as opposed to commercial) CCs are specifically designed to overcome these problems and incentivise sustainable development, for example by internalising environmental costs, or valuing non-marketed labour, and nurturing ecological citizenship (Lietaer, 2001; Seyfang, 2006). The complementary currencies examined here have sustainable social, economic and environmental goals, including transforming the consumption patterns of individuals, households and communities. Here I briefly review three existing types of CC, to

contextualise the discussion of PCT to follow (Table 1 contains more information on their origins, characteristics, impacts and challenges faced).

The first wave of CCs in the UK (from around 1990) and the most common type, are Local Exchange Trading Schemes (LETS). These combine social and economic objectives, and operate a parallel economy designed to strengthen local economic linkages, to offer a greater degree of resilience against economic shocks, and support local exchange in times of economic downturn. They are generally volunteer-run, community-based initiatives, with a 'green' ethos, although some have been supported by local government. LETS offer the potential to reduce consumption through sharing resources, promoting local import-substitution (bringing reduced transport costs), and building a sense of community around sustainable consumption activities (Seyfang, 2001, 2006, 2010; Williams et al, 2001).

Second, time banking is a social justice movement which prioritises wellbeing, social capital and reciprocity, and represents the second wave of CCs in the UK. It aims to rebuild supportive community networks of reciprocal self-help, particularly in deprived neighbourhoods. A time bank is essentially a volunteering exchange, usually run by local agencies or charities, with a paid broker to coordinate members' activities. Everyone's time is worth the same – one time credit per hour – regardless of the service provided (Cahn and Rowe, 1992). They promote social inclusion, and contribute to reducing consumption by meeting the participants' social and psychological needs for recognition, esteem and belongingness – needs which might otherwise be met through material consumption (Seyfang and Smith, 2002; Seyfang, 2010; Max-Neef, 1992).

The third CC is specifically environmental: a 'green reward point' currency, piloted in the Netherlands from 2002-3 by Barataria, a sustainability consultancy, and partnered by local government and businesses. It is 'NU Spaarpas', a reward card, similar to supermarket loyalty cards, and targets environmentally-friendly consumer behaviour. It provides incentives to switch consumption patterns when both earning and spending points; private businesses benefit at the same time as public goals (such as increasing recycling or public transport) are met, and this is the largest and most mainstream of the models discussed here (Holdsworth and Boyle, 2004; Van Sambeek and Kampers, 2004).

### **3. PERSONAL CARBON TRADING: A NEW CARBON CURRENCY**

“Imagine a country where carbon becomes a new currency.”  
(Miliband, 2006)

The UK government has set ambitious targets for reducing CO<sub>2</sub> emissions (HMG, 2008), but current measures do not appear to match the scale or speed that those targets demand (Anderson et al, 2005). A new policy proposal to help achieve these objectives is the mandatory introduction of carbon allowances or personal carbon trading (PCT)<sup>1</sup>, as a downwards extension of the EU Emissions Trading Scheme which currently applies to businesses. This 'cap-and-trade' system would set an overall UK carbon budget for a given time period (based on achieving the above emissions reduction target), would auction off 60

---

<sup>1</sup> Several terms are in use to refer to variations on the model: Domestic Tradable Quotas, Tradable Energy Quotas (both from Fleming, 2005), Personal Carbon Allowances (from Hillman, 2004), and Personal Carbon Trading (from RSA, 2007). They vary according to details such as what precisely is included in the allocation (eg public transport) and how children are accounted for (eg no allowance for children, or a half-allowance). This article is interested not in the minutiae of particular models, but rather in the overall principles, and as Roberts and Thumin assert: “the differences between the schemes appear to be less important at this stage than the largely untested assumptions shared by them all about public response and political feasibility” (2006, p. 3).

per cent to businesses and the public sector, and would divide the remaining 40 per cent (representing household energy-related emissions) into a free and equal per capita allocation for all citizens. These carbon credits might be stored on a 'smart card', and be spent alongside money when purchasing fuel or energy, providing market signals and incentives for adaptation to low-carbon consumption and lifestyles. They would be used by all citizens either explicitly (surrendering carbon units when paying bills) or implicitly (carbon costs being incorporated into petrol pump prices, for instance). High-energy users will need to purchase additional carbon credits, and low-energy users will be able to sell their surplus credits for profit, and each year the overall budget will be reduced with progressively stricter rationing. Furthermore, the costs of embedded carbon in other consumer goods and services will be included in market prices (passed down from producers), so ensuring that all carbon emissions are paid for. Having long-run carbon budgets allows individuals and businesses to plan for future restrictions in carbon allowances. Thus, an incentive system exists to encourage adaptation towards a low-carbon economy, rewarding those who adapt early in switching to low-carbon energy sources and reducing energy demand through conservation and efficiency measures. The benefits of PCT over regulation and taxation are claimed to be that it allows flexibility of response, it is visibly fair and universal (in contrast to taxation which breeds resentment, as seen with the fuel tax escalator in the UK which prompted fuel blockades), and that it offers the certainty of a predefined cap on emissions (Fleming, 2005; Hillman, 2004; Starkey and Anderson, 2005).

This model has been enthusiastically endorsed by key actors in the UK government, notably Rt Hon David Miliband, then Secretary of State for Environment, Food and Rural Affairs (Miliband, 2006; see also Roberts and Thumin, 2006). However, a subsequent pre-feasibility study by DEFRA (2008) concluded that PCT was too expensive and publically unacceptable to consider at present, but the Environmental Audit Committee disagreed and stated "We believe that personal carbon trading has the potential to drive greater emissions reductions than green taxation" (EAC, 2008:5), in particular if the social context was nurtured to view personal responsibility for carbon emissions as a fair and reasonable means of achieving an important public good. Recent research has examined feasibility and legitimacy, and social acceptability questions around PCT (RSA, 2007; Bottrill, 2006; RSA, 2007; Roberts and Thumin, 2006; Seyfang et al, 2009), but to date there have been no trials, and the lack of empirical experience hampers the development of the PCT idea (Fawcett et al, 2007). In order to address this knowledge gap, therefore, this paper presents the first analysis of PCT through the lens of complementary currencies (CCs) in order to identify the commonalities between these two areas of practice, and to ascertain whether the knowledge and experience from CCs can usefully be applied to PCT to inform its development as a policy proposal. How then, does PCT fit the CC picture?

Arguably the largest and most mainstream experiment in complementary currencies to date, PCT, with its 'carbon budgets', 'carbon points' and 'carbon credit cards' is a new national carbon currency, to be budgeted and spent alongside money. It operates as a medium of exchange (permits are surrendered in exchange for the CO<sub>2</sub> emissions associated with purchased goods and services – petrol, electricity, heating oil, flights etc); it is a unit of account (representing permission to emit a standard unit of CO<sub>2</sub>), but it is not a store of value (permits expire after a certain time). Although carbon credits can be exchanged for money, they are nevertheless spendable in their own right, and can be considered a 'limited purpose' money with specific socio-technical meanings. Carbon allowances would be conceptualised and used ('spent' and 'saved') much as other virtual currencies (e.g. air miles) are at present. PCT is a carbon currency structured and designed to achieve reductions in CO<sub>2</sub> emissions which mainstream money, as it is currently organised, does not. It achieves this by making explicit the CO<sub>2</sub> content of consumption decisions, and forcing individuals to internalise those costs. Uniquely in the set of CCs discussed here, it would be centrally administered by government, and participation would be mandatory for all citizens.



Table 1: Characteristics of Three Complementary Currencies, and Personal Carbon Trading

	<b>Local Money Systems (LETS)</b>	<b>Time Currencies (Time Banks)</b>	<b>Green Reward Points (NU)</b>	<b>Personal Carbon Trading</b>
<b>Principal objectives</b>	<i>Local economic development.</i> To strengthen the local(ised) economy and community through trading in a parallel currency.	<i>Social justice.</i> To build social capital in a neighbourhood through rewarding participation and volunteering.	<i>Environmental protection.</i> To reduce waste going into landfill, and promote public transport use. To incentivise more sustainable consumption choices, eg fair trade, local, organic, low-energy etc.	<i>Mitigating climate change: therefore economic, social and environmental.</i> To implement national carbon budgets and reduce carbon emissions over time.
<b>Degrowth potential</b>	Localisation, sharing resources, import substitution. Does not necessarily challenge green growth model	Sharing resources, meeting social and psychological needs thereby reducing need to consume materially	Shifting consumption patterns to greener options, but does not challenge green growth model	Cutting carbon emissions does not necessarily reduce overall consumption; no aim to challenge green growth.
<b>Mechanism</b>	Local money system – cashless exchange among members of a geographically-based community, facilitated by a members' directory of goods/services on offer.	Time-based volunteering-reward system, managed through a broker. One hour equals one credit, regardless of the service provided.	Loyalty points system on smartcards, rewarding sustainable consumption/behaviour.	Equal per capita allocation of carbon allowances, to be spent or traded. National carbon budget reduces year on year.
<b>Origins and development.</b>	LETS originally designed by Michael Linton in 1985; idea spread from Canada across world, primarily to UK, Australia, New Zealand, being adapted and evolving in new contexts.	Designed by Edgar Cahn in 1985, developed in the US and spread to the UK in 1997. Different models in development in UK, experimenting with agencies, public services, etc.	Dutch NGO Barataria developed the idea, piloted it with Rotterdam local government and businesses (2004-5). Since the pilot ended the idea has continued to develop and new applications are sought.	Top-down policy proposal by David Fleming, 1996. Caught imagination of UK policymakers in 2006 (Miliband), prompting further research to develop and test PCT models.
<b>Set up by</b>	Mainly by individual volunteer activists, many with strong green commitments; sometimes by local government.	Mainly by local public service agencies/NGOs/local government.	Partnership between NGO, local government and businesses.	Government.
<b>Scale</b>	UK LETS size on average 73, city-wide or neighbourhood-based. LETS peaked in UK in late 1990s with approx 300 schemes.	Average size 77 members, usually neighbourhood-based. Currently 78 active time banks in UK.	Pilot ran from May 2002 till October 2003 and attracted 10,000 cardholders and 100 businesses in a city-wide project.	UK-wide: compulsory participation for all adult citizens in the UK.

<b>Opportunities</b>	<p>LETS grow in times of recession, providing an alternative labour market, opportunities for informal employment and cash-free access to goods and services.</p>	<p>Time banks provide mediated social care services in neighbourhoods where mutual support networks have been eroded. In the USA time banks provide more essential services, because there is no effective welfare safety net; this is less urgent in the UK.</p>	<p>A direct way to support and promote locally-owned businesses and local produce – timely social concerns – and to meet government policy goals on waste and energy.</p> <p>Uses a familiar trading mechanism – the public are accustomed to trading with virtual currencies eg nectar cards and supermarket loyalty points.</p>	<p>Climate change and Stern review – need for policy instruments to achieve high levels of carbon reduction. Growing public understanding of ‘carbon footprints’.</p> <p>Public are accustomed to trading with virtual currencies eg nectar cards and supermarket loyalty points.</p>
<b>Achievements</b>	<p>Offers opportunities to gain skills, build social contacts, earn income and access interest-free credit.</p> <p>Participants enjoy being able to put their values into practice through the new system of exchange.</p>	<p>Delivers social inclusion, wellbeing, health and mental health improvements; also skills development.</p> <p>Participants cherish the space to enact egalitarian and non-market values.</p>	<p>Pilot project gave indicative benefits of achieving government waste reduction objectives and stimulating more local/green consumption.</p>	<p>Untested</p>
<b>Internal weaknesses</b>	<p>Limited range of goods and services available.</p> <p>High levels of social skills required to participate.</p> <p>People join because they like the idea, but don’t participate – stagnation.</p> <p>Green cliques - exclusionary.</p>	<p>Limited range of services available – ‘skills gap’.</p> <p>Cultural barriers - people prefer to give than receive, leading to stagnation.</p>	<p>Slow to recruit businesses.</p> <p>In the pilot the scheme was changed to expand the range of businesses and goods which attract green points, to allow participants to reap the benefits more easily. Ongoing development and evolution hampered by time-limited pilot.</p>	<p>High cost of implementation compared to taxation and regulation.</p> <p>Unknown level of skills and ‘carbon capability’ required to effectively use PCT.</p> <p>Public not accustomed to accounting for carbon content of consumption.</p>
<b>External threats and barriers</b>	<p>Government social policy – LETS income counts against unemployment benefits.</p>	<p>Requires funding to manage the scheme. Government policy on disability payments.</p> <p>UK social security system provides adequate safety net – not the same imperatives as in USA.</p>	<p>Pilot project was time-limited due to funding constraints, and a refined version has not yet been implemented.</p> <p>Supermarkets are issuing their own green loyalty points – eg Tesco</p>	<p>Public acceptability, especially if linked with ID cards?</p>
<b>Key research, resources and further information</b>	<p>Croall (1997)</p> <p>Seyfang (2001)</p> <p>Williams et al (2001)</p> <p>LETSLink UK: <a href="http://www.letslinkuk.net">www.letslinkuk.net</a></p>	<p>Seyfang and Smith (2002)</p> <p>Cahn (2000)</p> <p>Burns (2004)</p> <p>Time Banks UK: <a href="http://www.timebanks.co.uk">www.timebanks.co.uk</a></p> <p>Time Banks USA: <a href="http://www.timebanks.org">www.timebanks.org</a></p>	<p>Van Sambeek and Kampers (2004)</p> <p>Verheyen (2006)</p> <p>Holdsworth and Boyle (2004)</p> <p>Bibbings (2004)</p> <p>NU: <a href="http://www.nuspaarpas.nl">www.nuspaarpas.nl</a></p>	<p>Starkey and Anderson (2005)</p> <p>Hillman (2004)</p> <p>Bottril (2006)</p> <p>Roberts and Thumin (2006)</p> <p>RSA: <a href="http://www.rsacarbonlimited.org">www.rsacarbonlimited.org</a></p> <p>Fleming/TEQS: <a href="http://www.teqs.net">www.teqs.net</a></p>

#### **4. CRITICAL SUCCESS FACTORS FOR COMPLEMENTARY CURRENCIES**

Given the diversity of CC types shown in Table 1, from community-led alternative economic systems, to mandatory top-down carbon allowances, what lessons can be drawn to inform the development of successful initiatives for sustainable consumption? Table 1 shows the four models on a spectrum of descriptive characteristics (objectives, impacts, mechanisms etc) from left to right: PCT is merely an extreme position. Moving from left to right across the table, from what is empirically known, to what is untried and unknown, there is a growth in scale, formal institutionalisation and actors, policy support, top-down control, mass-appeal, mainstreaming and professionalization. Associated with these shifts, is a corresponding reduction in the social interaction required to use the currencies, and the personal engagement demanded by them. Arguably, there is also a move away from 'degrowth' ecological citizenship, and towards 'green growth' ecological modernisation instead. Nevertheless the fundamental commonality of the currencies provides insights into the generalisable lessons for CC development which can be transferred across contexts, and are of central importance to the successful adoption and effectiveness of PCT as a tool for sustainable consumption.

##### **4.1 Policy Context**

Aligning the interests of a CC with policy goals is key to attracting large scale funding and support, but even this is no guarantee, and projects dependent on funding often struggle for survival. The NU pilot was halted when funding ran out, despite being instigated by local government, and despite government backing, and many time banks have also ceased operating due to lack of funds (Time Banks UK, 2007). The policy context can be inconsistent too, as both LETS and time banks participants face an inhibitive government policy on CC income and welfare payments, including disability benefit, which deters participants who could otherwise benefit from the schemes. In contrast, PCT would be implemented and fully supported by government, and will doubtless be accompanied by high-profile marketing campaigns and advanced technology to ease its adoption. Nevertheless, lack of policy coherence can still hinder government initiatives, and the interactions between PCT and related policies (transport, trade and industry, tourism, energy) would need careful attention (Kerr, 2008).

##### **4.2 Social Context and Culture**

Second, CCs develop within, and are relevant for, specific social contexts. They arise as a response to a social need or policy objective, either spontaneously from the community-level grassroots, or from above through a government-supported programme. This context provides an enabling and nurturing political and cultural environment within which it can spread and grow. LETS is an economic self-help tool and appeared to peak during the 1990s recessions; time banks emerged in the USA where a lack of public provision meant that essential social services were non-existent in the poorest areas; and NU was introduced in the Netherlands, a country with a strong sense of environmental civic duty. In each of these cases, the social context strongly influenced the profile of founders and early participants, the types of engagement demanded, and the 'culture' of the projects: green pioneers in the case of LETS, social justice activists in time banks, and environmental NGOs and local government with NU. These differing profiles have implications for growth and success of voluntary schemes, and acceptability and effectiveness of mandatory ones. For example, without dedicated effort to broaden the scope of the projects, these cultural and political groupings tend to mitigate against mainstreaming, as they attract like-minded members who see the projects as an expression of contested political culture: community-based LETS and time banks have been described as *alternative to the mainstream* (Seyfang, 2009), although this can appear exclusionary to other social groups (Williams et al, 2001). In addition, the types and levels of personal interaction demanded by LETS and time banks can be daunting

or unwelcome for some, who prefer anonymised modern transaction styles. To counter this, time banks situated themselves within mainstream social care settings, and NU intended from the outset to have widespread mass-appeal by presenting itself as 'normal' consumer behaviour. However, in the PCT literature, social and cultural matters are given little attention, other than cursory mentions of government information campaigns to promote public acceptance (Starkey and Anderson, 2005). Acceptability issues will need to be addressed in order that PCT is seen as a legitimate and fair tool for the task of reducing carbon emissions. But experience with environmental issues has shown that information campaigns are not necessarily effective at changing hearts and minds. A rationalist approach lacks the power to engage citizens in a shared endeavour, and introducing a large scale, mandatory, utilitarian market-based mechanism such as a *laissez faire* PCT scheme risks alienating the committed social movement activists who operate in value-led niches. Fleming (2005) is alone in addressing political culture within the PCT literature, and we return to this below.

### **4.3 Technologies**

The nature of the new socio-technological system of exchange itself (ie complementary currencies or PCT), and related issues around credibility, ease of use, transaction costs, and mainstreaming, are a third area of interest. Some CCs operate using paper cheques or notes, sometimes passed to an accountant, or recorded over the telephone. In all cases, transaction costs are significantly higher than using cash, and it is reasonable to assume that these costs and unfamiliar mechanisms deter some participants. To overcome these problems, NU used modern smartcards and point-of-sale card-readers in regular stores, not unlike current supermarket loyalty cards. By adopting a familiar, efficient and straightforward technology, NU ensured a much greater mainstream diffusion of the project, and successfully integrated their technology into the shopping habits of consumers. Current predictions about PCT suggest that it too would be managed on smartcard technology, presuming that spending carbon credits will be a seamless operation when paying bills and purchasing fuel, so lowering the transaction costs and ensuring ease of use (Starkey and Anderson, 2005; Roberts and Thumin, 2006). However, PCT is often linked in the literature with ID cards, a politically unpopular proposal, which raises a further set of acceptability and civil liberty issues in addition to technical matters of security and fraud prevention. Other aspects to consider are the mechanisms of the carbon currency itself. CCs are frequently designed as a means of exchange rather than a store of value, hoarding is still a problem which contributes to system stagnation. This happens for a variety of reasons including reluctance to ask for help, inability to find goods and services to purchase, and a desire to save for a rainy day – in some cases, this is 'irrational' behaviour in neo-classical economics terms, although it makes sense within a more socially-embedded understanding of the role and meaning of these special monies. Applying these lessons to PCT, a crucial issue will be the design of the currency, and whether allowances are carried over from one period to the next, allowed to be traded, stored up for the future, and so on, and understanding the social factors influencing consumer behaviour with virtual currencies.

### **4.4 Skills and Capabilities**

The next critical factor to examine is the combination of skills, capabilities and confidence required to use a CC: previous experience with LETS and time banks demonstrate that it is not sufficient to simply introduce new systems of exchange and expect people's behaviour to adapt to the new infrastructure. Barriers include the high levels of social skills and personal confidence required to initiate a transaction by browsing through a directory and telephoning someone to arrange a trade, which might involve visiting the person's home. Time banks overcome this obstacle by operating through a broker, who builds the confidence and participation of members, and who actively recruits people from more socially excluded

groups. However, a time bank transaction is even further removed from normal modes of exchange, and requires significant personal interaction, which may deter participation, as much as it is an attractive feature for some (Seyfang, 2003). In contrast to these very personalised CCs, NU's modern technology – smartcard systems in retailers - is a format with which consumers are already familiar and *skilled*, and which requires little additional effort or interaction. PCT would certainly mirror this approach to reduce the cultural and technical barriers to adoption; however, the issue of skills and capabilities remains.

While PCT proposals envisage carbon trading as a technically trivial matter, the deeper issue of really understanding carbon budgets and how to manage them through behaviour change – what we might call 'carbon capability' as an analogue to financial capability – is a neglected and undeveloped competency. Whereas time and money are familiar quantifiable concepts, the abstract idea of carbon emissions, and one's personal responsibility for them, is a new phenomenon to be applied to individual decision-making. This internalisation requires new sets of understandings and skills, but there is very little acknowledgement of this in the PCT literature; the ecological modernisation presumption appears to be that the carbon market will efficiently redirect (rational, utilitarian) consumer decision-making towards low-carbon behaviour. Additionally, Fleming (2005), and Starkey and Anderson (2005) claim that understanding is not a prerequisite of using the scheme, and that consumers could legitimately sell their allowances immediately, and 'pay as they go' instead, without dealing with carbon budgets at all. While possible, this would jettison the potential to nurture ecological citizenship through engaging in conscious environmental governance. For PCT to induce behaviour change towards carbon reduction, individuals must have a good grasp of the causes of carbon emissions, the role they themselves play in producing them, the scope for reductions in one's personal life, and how to manage a carbon budget, where to get help and information, and so on (Seyfang et al, 2009; Whitmarsh et al, 2009). The RSA's Carbon DAQ voluntary online (virtual) carbon market is developing these competencies, and as the concept of 'carbon footprints' becomes widely known (Siegel, 2007), public carbon awareness is increasing.

#### **4.5 Harnessing Collective Action**

In CCs, participants collectively create and use an alternative, more sustainable system of exchange. For many LETS and time banks members, co-creating new social institutions is the biggest benefit of participation, as an act of empowerment, and a means of expressing ecological citizenship. The lesson for PCT is that harnessing this creative collaboration to achieve the goal of reducing carbon emissions, operating not simply through the summation of individualistic rational decision-making activities, but also through a collective, community-based process of behaviour change based on civic engagement around practised environmental responsibilities, will deliver the most effective engagement. By working with grassroots citizenship activity, PCT could achieve its aims more effectively, while simultaneously contributing towards the development of carbon capability, and generating a positive social context for carbon management and emissions-reductions. Fleming (2005) emphasises the 'common purpose' which PCT engenders, whereby one's economic self-interest in cutting carbon emissions is ultimately served by enabling others to reduce their emissions too, so lowering the carbon market price. He asserts that PCT *must* design-in this shared incentive to reduce carbon emissions, as a solid foundation for a new shared social and ecological ethic, because all citizens will be, by definition, equal stakeholders in the environment.

In the absence of PCT trials, the growth of Carbon Rationing Action Groups (CRAGS) in the UK offers experience in generating common purpose. There are currently around 35 groups for people to voluntarily measure, budget and work together to reduce their carbon emissions, comprising prototype community-based carbon-reduction initiatives (see [www.carbonrationing.org.uk](http://www.carbonrationing.org.uk)). Although CRAGS do not trade carbon units, they set carbon

allowances and offer a small financial reward (a few pence per kilogramme of carbon) for under-emitting, and penalise over-emitters. One participant remarked “My carbon allowance is becoming a secondary currency that informs all sorts of day-to-day decisions” (Bassendine, 2009). In addition to being the only carbon-related activity for individuals comparable to PCT, they offer a test-bed for the development of carbon capability skills and nurturing collective motivation (Seyfang et al, 2009). Future research could usefully examine the ways in which these social movements mobilise action for carbon-reduction within social contexts, and how these mechanisms might be extended beyond the initial cadre of environmental enthusiasts.

## 5. CONCLUSIONS

Sustainable consumption demands radical changes to the socio-economic and socio-technical systems of provision in society, in order to realign development goals towards quality of life rather than material consumption. Complementary currencies (CCs) have been proposed as new systems of *exchange*, to achieve these goals, and this paper has reviewed experience with several models of CCs, along with an untested CC policy proposal known as Personal Carbon Trading (PCT), which proposes to issue carbon currency to all UK citizens, with the aim of limiting and reducing carbon emissions. PCT has been presented as an economically efficient instrument to send market signals about reducing carbon emissions, and thereby encourage and enable citizens to change their consumption behaviour appropriately. However, the lack of empirical experience with PCT hinders its development. In response this paper has made the novel conceptual link between CCs and ‘carbon-currency’ PCT proposals, in order to shed light on some of the key issues which need to be better understood in order for PCT to be effective. It is found that for all CCs, and therefore equally for PCT, the following factors are significant in influencing their character, impacts and outcomes: policy coherence; social contexts and cultures; technologies; skills and capabilities; and finally, the extent to which the CCs enlist and engage with active citizenship. This comparative analysis reveals important social and political factors which will influence the development and success or otherwise of CCs, and by definition, PCT. If CCs are to be effective at reshaping systems of provision, and if PCT is to be effective at enabling a smooth reduction in household carbon emissions, then these factors must be addressed.

This analysis has highlighted two key areas for future research and action into PCT, to inform its development as an effective policy proposal. The first challenge is to identify the carbon capability skills and social cultures which will be crucial to its success, and design a range of tools for boosting and measuring carbon capability (see for example Whitmarsh et al, 2009). The second is to reflect on how PCT can be implemented in such a way as to nurture and reinforce collaborative grassroots action to reduce carbon emissions within a context of community engagement, as opposed to being an entirely individualistic tool. While proponents of PCT talk in terms of *ecological modernisation* - incorporating the environment into markets - what we are really dealing with is a matter of *ecological citizenship* – collaboration, shared values, and a commitment to reducing consumption. The next phase of research into the PCT feasibility must address this paradox, in order to harness this potentially powerful new CC policy tool to achieve sustainable consumption.

## REFERENCES

- Anderson, K., Shackley, S., Mander, S. and Bows, A. (2005) *Decarbonising the UK: energy in a climate conscious future*. Technical Report 33, (Tyndall Centre, Norwich),
- Bassendine, D. (2009) 'David' <<http://www.carbonrationing.org.uk/user/david>> accessed 17 June 2009
- Bibbings, J. (2004) *A Sustainability Reward Card for Wales*, (Welsh Consumer Council, Cardiff).
- Bottril, C. (ed) (2006) *Personal Carbon Trading: An exploratory research and policy workshop Summary Report* (UKERC, London).
- Boyle, D. (ed) (2002) *The Money Changers: Currency Reform From Aristotle To E-Cash*, (Earthscan, London).
- Burns, S. (2004) *Exploring Co-Production: An overview of past, present and future*, (New Economics Foundation, London.)
- Cahn, E. (2000) *No More Throwaway People: The co-production imperative* (Washington, Essential Books)
- Cahn, E. and Rowe, J. (1992) *Time Dollar* (Family Resource Coalition of America, Chicago)
- Carbon Trust (2006) *The Carbon Emissions Generated In All That We Consume* (Carbon Trust, London)
- Croall, J. (1997) *LETS Act Locally: The growth of Local Exchange Trading Systems*, (Calouste Gulbenkian Foundation, London).
- DEFRA (2003) *Changing Patterns: UK Government Framework for Sustainable Consumption and Production* (Defra, London).
- DEFRA (2008) *Synthesis report on the findings from DEFRA's pre-feasibility study into personal carbon trading*. London: DEFRA.
- DeMeulenaere, S. (2008) '2007 Annual Report of the Worldwide Database Of Complementary Currency Systems', *International Journal of Community Currency Research* Vol 11 < [www.le.ac.uk/ulmc/ijcct/](http://www.le.ac.uk/ulmc/ijcct/)>
- Dobson, A. (2003) *Citizenship And The Environment*, (Oxford University Press, Oxford).
- Dodd, N. (1994) *The Sociology Of Money: Economics, reason and contemporary society*, Polity, Cambridge
- Ekins, P. (ed) (1986) *The Living Economy: A New Economics in the Making*, (Routledge, London).
- Environmental Audit Committee (EAC) (2008) *Personal Carbon Trading Fifth Report of Session 2007-08, HC 565* (London: The Stationery Office).
- Fawcett, T., Bottrill, C., Boardman, B. and Lye, G., 2007. Trialling personal carbon allowances. UKERC, Oxford.
- Fleming, D. (2005) *Energy and the Common Purpose: Descending the energy staircase with Tradable Energy Quotas (TEQs)* (The Lean Economy Connection, London)
- Greco, T. (2001) *Money: Understanding and Creating Alternatives To Legal Tender* (Chelsea Green, Vermont)
- Hillman, M. (2004) *How We Can Save The Planet* (Penguin, London)
- HMG (2008) *Climate Change Act 2008* (The Stationery Office, London)
- Holdsworth, M. and Boyle, D. (2004) *Carrots Not Sticks: The possibilities of a sustainability reward card for the UK*, (New Economics Foundation and National Consumer Council, London)

- Jackson, T. (2006) 'Consuming Paradise? Towards a social and cultural psychology of sustainable consumption' in T. Jackson, (ed) *The Earthscan Reader In Sustainable Consumption* (Earthscan, London) pp.367-395
- Jackson, T. (2009) *Prosperity Without Growth? The transition to a sustainable economy* (Sustainable Development Commission, London)
- Kerr, A. (2008) *Personal Carbon Trading: Economic efficiency and interaction with other policies* (RSA, London)
- Lietaer, B. (2001) *The Future Of Money: Creating new wealth, work and a wiser world*, (Century, London).
- Lipsey, R. and Harbury, C. (1992) *First Principles of Economics* 2nd edition (Oxford: Oxford University Press)
- Max-Neef, M. (1992) 'Development And Human Needs' in Ekins, P. and Max-Neef, M. (eds) *Real-Life Economics: Understanding Wealth Creation* (London: Routledge) pp.197-213
- Miliband, D. (2006) *The Great Stink: Towards An Environmental Contract*, speech by the Rt Hon David Miliband MP, Audit Commission annual lecture, Wednesday 19<sup>th</sup> July 2006, available online at <www.defra.gov.uk>, accessed 15/02/07
- ONS (2004) *The Impact Of UK Households On The Environment Through Direct And Indirect Generation Of Greenhouse Gas Emissions* (ONS, London)
- Roberts, S. and Thumin, J. (2006) *A Rough Guide To Individual Carbon Trading: The ideas, the issues and the next steps* (DEFRA, London)
- RSA (2007) *Personal Carbon Trading: The idea, its development and design* (RSA, London)
- Seyfang, G. (2000) "The Euro, The Pound And The Shell In Our Pockets: Rationales For Complementary Currencies In A Global Economy" *New Political Economy*, Vol 5, No 2, pp 227-246
- Seyfang, G. (2001) 'Community Currencies: Small Change for a Green Economy' *Environment and Planning A* Vol 33 (6), pp.975-996
- Seyfang, G. (2003) 'Growing Cohesive Communities, One Favour At A Time: Social exclusion, active citizenship and time banks', *International Journal of Urban and Regional Research*, Vol 27 (3) pp.699-706
- Seyfang, G. (2006) 'Sustainable Consumption, the New Economics and Community Currencies: developing new institutions for environmental governance' in *Regional Studies* Vol 40(7) pp.781-791
- Seyfang, G. (2010) 'Low-Carbon Communities and the Currencies of Change' in Peters, M., Fudge, S. and Jackson, T. (eds) *Low Carbon Communities: Imaginative approaches to combating climate change locally* (Edward Elgar, Cheltenham)
- Seyfang, G. and Smith, A. (2007) 'Grassroots Innovations for Sustainable Development: towards a new research and policy agenda' *Environmental Politics*, Vol 16(4) pp.584-603
- Seyfang, G. and Smith, K. (2002) *The Time Of Our Lives: Using time banking for neighbourhood renewal and community capacity-building* (New Economics Foundation, London).
- Seyfang, G., Lorenzoni, I. and Nye, M. (2009) *Personal Carbon Trading: A critical examination of proposals for the UK*, Tyndall Centre Working Paper (Tyndall Centre, Norwich)
- Shove, E. 2003, *Comfort, Cleanliness and Convenience: The Social Organisation of Normality* Berg, Oxford.
- Siegel, L. (2007) 'The Low-Carbon Diet', *Observer Magazine* 21/1/07



- Starkey, R. and Anderson, K. (2005) *Domestic Tradable Quotas: A Policy Instrument for Reducing Greenhouse Gas Emissions from Energy Use*, Technical Report 39, (Tyndall Centre for Climate Change Research, UEA, Norwich)
- TimeBanks UK (2007) *Time Banking To Date*  
 <[http://www.timebanks.co.uk/about\\_timebanking.asp](http://www.timebanks.co.uk/about_timebanking.asp)> accessed 3 March 2007
- van Sambeek, P. and Kampers, E. (2004) *NU-Spaarpas: The sustainable incentive card*, (Stichting Points, Amsterdam)
- Van Vliet, B., Chappells, H. and Shove, E. (2005) *Infrastructures Of Consumption: Environmental Innovation In The Utility Industries*, (Earthscan, London).
- Verheyen, J. (2006) *Can We 'Save' The Environment: Research into the feasibility of bonus cards to stimulate environmentally-friendly consumption* (Public Waste Agency of Flanders).
- Whitmarsh, L., O'Neill, S., Seyfang, G. and Lorenzoni, I. (2009) 'Carbon Capability: Understanding, ability and motivation for reducing carbon emissions' in Stibbe, A. (ed) *The Handbook of Sustainability Literacy: skills for surviving and thriving in the twentyfirst century* (Green Books)
- Williams, C. C., Aldridge, T., Tooke, J., Lee, R., Leyshon, A. and Thrift, N. (2001) *Bridges into Work: an evaluation of Local Exchange Trading Schemes (LETS)* (Policy Press: Bristol)
- Young, S. (2000) *The Emergence of Ecological Modernisation: Integrating the Environment and the Economy?*, (London, Routledge)
- Zelizer, V. A. (1994) *The Social Meaning Of Money*, Basic Books, New York