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**Personal Carbon Trading in the United Kingdom:
Considering opportunities in times of climate change and the
financial market crisis**

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IV List of Abbreviations

CDM	Clean Development Mechanism
CO ₂	Carbon Dioxide
CSE	Centre for Sustainable Energy
DEFRA	Department for Environment, Food and Rural Affairs
DTQs	Domestic Tradable Quotas
EIT	Economies in Transition
EU ETS	European Union Emission Trading System
EU	European Union
FDI	Foreign Direct Investment
Feasta	Foundation for the Economics of Sustainability
FSA	Financial Services Authority
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GWP	Global Warming Potential
ID	Identification
IPCC	Intergovernmental Panel on Climate Change
IPPR	Institute for Public Policy Research
JI	Joint Implementation
Kg	Kilogram
Mt	Million metric tons
MtCe	Million tonnes of carbon equivalent
OECD	Organisation for Economic Co-operation and Development
PCAs	Personal Carbon Allowances
RAPS	Rate All Products and Services
t	Tonne
TEQs	Tradable Energy Quotas
TfL	Transport for London
UK	United Kingdom
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America

1 Introduction

1.1 Aim definition

In the 21st century climate change has become an omnipresent and most important matter to all nations of the world. The industrialised western countries have been living beyond their means regarding greenhouse gas emissions and non-renewable resources for the last decades. Calculations like the ecological debt day illustrate the need for change in attitudes and behaviours towards our environment. First steps are being taken with projects as the European Union Emissions Trading Scheme but need to be pursued much further in order to achieve and create a more sustainable future.

The other compounding affair of the last years was and is the financial market crisis affecting nations around the world at different levels. In many countries this crisis has unveiled structural problems and forced their governments to raise credits for astronomical amounts. Therein also lays the challenge for the affected nations. They have to combine restoring their economies and implementing climate change goals as reduction of CO₂ emissions in the near future.

In the aftermath of the financial market crisis a lot of money is being borrowed and invested by the public bodies to revive the economy and save important financial institutions. And while it is important to do so, it is even more important to invest in substantial climate protection industries and policies. By doing this, the government can pursue the two aims of climate protection and economic recovery at the same time.

The personal carbon trading concept, which proposes inclusion of domestic households in emissions trading, may be a policy instrument which could help governments to move their nations towards a low-carbon future, and might also be an appropriate policy instrument after the financial market crisis because of its progressive nature.

This paper aims at providing a thorough understanding of the concept of personal carbon trading and its characteristics, advantages and disadvantages in times of climate change and the financial market crisis. Because the concept has been developed mostly in the United Kingdom, this paper analyses the British circumstances. But the general findings are transferable to other countries.

1.2 Approach and Methodology

This empirical paper consists of a theoretical part and a qualitative investigation by means of expert interviews.

The paper first establishes the theoretical grounds of the two contributing factors climate change and financial market crisis. After this clarification the correlations between these two factors are assessed and described. Following these findings, the personal carbon trading scheme is explained with all its implications both for climate change and the British economy after the financial market crisis.

Then the expert interviews are introduced with a chapter on procedure, analysis and main findings. The questions for the interviews were composed out of the before conducted analysis of climate change, the financial market crisis and a personal carbon trading scheme.

Lastly the findings from both theoretical and interview analysis are combined to conclude this paper.

1.3 Structure

This paper is divided into 10 chapters, which contain several subchapters. After the first introducing chapter, the paper moves to the second chapter about climate change, its definition, implications and international recognition done so far. It includes recent scientific findings on the effects of the climate crisis, the causes, responsibilities and international treaties and agreements.

The following chapter investigates the specific British climate policies of the last years and one chapter about the Emission Trading System implementation in the European Union in general.

The fourth chapter will highlight the impact and main characteristics of the financial market crisis in the United Kingdom. Chapter 4.3 establishes important correlations between the financial and environmental crisis.

Chapter 5 subsequently explains the personal carbon trading scheme in detail. It explains the development of the scheme over recent years, the different approaches and concepts which exist and how the scheme is supposed to work theoretically and practically. The differentiation between the base scheme and other proposals is

made and very important, because the base scheme is used in the further course of this paper.

The next chapter is about the efficiency of the scheme and entails subchapters on its emission savings potential, the increase of public awareness towards environmental issues and green taxation as a substitute scheme. Since implementing a tax is often viewed as the more attractive option, this comparison is important to highlight the main differences.

The seventh chapter looks at the equity and effectiveness of the scheme. It encloses subchapters on public acceptance of the scheme, the income redistribution which will take place when introducing a personal carbon trading scheme and the costs and feasibility of the technical implementation.

This is followed by the chapter with the qualitative results from the interviews conducted for this paper. First of all the general procedure and selection of interviewees will be described, followed by an interview analysis and the main cognitions and take-away for this paper.

Chapter 9 describes the main findings established in the course of this paper on personal carbon trading as a policy measure. It summarizes the economic and ecologic need for action and makes an important comparison of the economic scheme costs and gains of the scheme as assessed before.

Lastly, chapter 10, is the conclusion of this paper which is divided into the headline findings and an outlook of the future prospects of personal carbon trading.

2 The climate crisis and the need for action

2.1 Extend and effects of the climate crisis

Current warming of the earth climate has so far resulted in increases of average air and ocean temperatures, droughts, floods, melting ice caps and rising sea levels.

One common definition of climate change is provided by the IPCC, the Intergovernmental Panel on Climate Change. The IPCC continuously publishes climate change reports, the last one being disseminated in 2007, which are comprehensive reports on the scientific underlining of climate change.¹ Their definition of climate change “refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity”.² This definition includes climate changes which are caused by either nature itself or caused by mankind.

The most common definition of climate change is provided by the United Nations Framework Convention on Climate Change, the UNFCCC. Their definition states that climate change is “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability over comparable time periods”.³ In contrast to the IPCC definition of climate change, this definition clearly holds humans responsible for the ongoing climate change through our continuous anti-ecological actions. It does not include the possibility of climate change based on natural processes. With this definition in mind, climate change is something human-made which harms the biosphere.

The fourth assessment report by the IPCC published in 2007 notes that the 100-year linear trend (1906 to 2005) depicts a global temperature increase of 0.74 degrees. Eleven out of the twelve years from 1995 to 2006 are ranked among the 12 warmest years in the records of mean earth temperature. Global ocean temperatures, in depths as far as 3000 meters, have increased also, following records of observations from 1961 onwards. This warming of the oceans is resulting from the growing absorption of heat, evidently more than 80%, which is due to melting glaciers that

¹ For more information on the IPCC and their Climate Change reports, visit www.ipcc.ch

² IPCC: Synthesis report. IPCC 2007. p. 30

³ UNFCCC Bali website, Glossary 2010. <http://unfccc.org/> (14.07.2010)

would normally act as mirrors to sunlight and overall rising temperatures. Melting glaciers have also contributed to rising global sea levels, along with melting ice caps, snow covers and thermal expansion. Average sea levels have risen at a rate of 1.8 millimetres per year from the period 1961 to 2003. Again the last ten years, from 1993 to 2003, have surpassed this average rate and contribute with a ten-year average of 3.1 millimetres. Almost double the average global temperature increase has been recorded in the Arctic over the past 100 years. This also led to the shrinkage of annual average arctic sea ice extent of 2.7% per decade, with more shrinkage reported in summer months.⁴

The report furthermore states that “the observed widespread warming of the atmosphere and ocean, together with ice mass loss, support the conclusion that it is *extremely unlikely* that global climate change of the past 50 years can be explained without external forcing, and *very likely* that it is not due to known natural causes alone”⁵

Furthermore the report notes that with the current climate policies, Greenhouse Gas (GHG) emissions will very likely grow over the next decades and will do so in a range from 25% to 90% between 2000 and 2030. The major contributors to this increase will then be developing countries, still they will have lower per-capita emissions than advanced countries and economies in transition. Which implications an increase as high as 90% of GHG emissions would eventually have is hard to assess today since it will probably trigger processes that we are not even aware of at the moment.⁶

Another finding of the reports second working group on ‘Impacts, Adaptation and Vulnerability of climate change’ is that “sustainable development can reduce vulnerability to climate change, and climate change could impede nations’ abilities to achieve sustainable development pathways”.⁷ This statement emphasises the need for political action to steer their economies towards a sustainable low-carbon future. If global warming and climate change continue as it is, then all countries might be affected in ways that will hinder them from taking necessary action.

⁴ Cf. IPCC Fourth Assessment Report: Working Group I Report “The Physical Science Base”, Technical Summary, p. 5 cc.

⁵ IPCC Fourth Assessment Report: Working Group I Report “The Physical Science Base”, Technical Summary, p. 10

⁶ Important to note about the reports of the IPCC is the circumstance that every country, the USA included, which forms part of it has to approve the final report. The projections might therefore sometimes even be understated compared to other scientific literature on the impacts of climate change.

⁷ IPCC Fourth Assessment Report: Working Group II Report “Impacts, Adaptation and Vulnerability”, Summary for Policy makers, p. 20

2.2 Greenhouse gas emissions

The global warming of our climate is caused by emitting the long-lived GHG, which the earth atmosphere can not absorb in the high quantities in which they are being emitted. GHG are responsible for trapping more heat of the sun within the atmosphere, which is the most vulnerable part of the earth, and this process results in increasing global temperatures. The Kyoto Protocol from December 1997, which served and serves as a supplementary protocol to the United Nations Framework Convention on Climate Change, the UNFCCC, defines the 6 Greenhouse Gases which reduction is essential and necessary. The most important of these substances being Carbon dioxide, CO₂, whose emissions are the highest worldwide. Other agreed upon substances include Methane, Nitrous oxide, Hydroflourocarbons, Perfluorocarbons and Sulphur hexafluoride. The ultimate goal of the UNFCCC is the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”.⁸

The latest Intergovernmental Panel on Climate Change report states that the carbon dioxide annual emissions have grown by approximately 80% between the years of 1970 and 2004 and represented 77% of all emissions in 2004. Overall growth of GHG from 1970 to 2004 has been at 70%. This rapid growth in anthropogenic GHG emissions has resulted from growing consumption in energy, transport and industry. The largest share of the growing emissions has resulted from the energy supply sector which experienced an increase of 145%.⁹

The following chart illustrates the composition of the current GHG emissions over the next 100 years and their contribution to global warming.

⁸ Article 2 of the 1992 United Nations Framework Convention on Climate Change.

⁹ Cf. IPCC Fourth Assessment Report: Working Group III Report “Mitigation of Climate Change”, Summary for Policy maker, p. 3 cc.

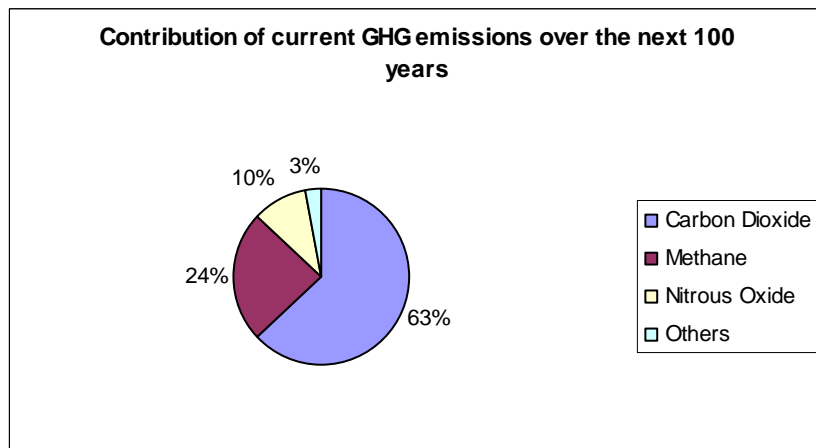


Figure 1: Contribution of current GHG emissions, HM Government: Climate Change: The UK Programme 2006. Norwich 2006. P. 9¹⁰

This table clearly depicts carbon dioxide as the main emitted GHG at the moment and in the future. But the table does not state anything about the actual impact of each of the GHG for global warming. This is why all GHG emissions can be translated into their Global Warming Potential (GWP), which calculates their impact in carbon dioxide emissions. This calculation was developed by the IPCC in 1990 and has also been adopted in the Kyoto protocol. There are also several other calculation methods for GWP which take into account time horizon, radioactive forcing and other variables. The GWP index developed by the IPCC compares the impact of 1 kg of any GHG against the impact of 1 kg of carbon dioxide. The assessed GWP of the several GHG are then calculated for different time horizons as well. Again, CO₂ as the basis has a GWP of 1 independent from the time horizon. The GWP of Methane for example is 72 when looking at a 20 year time period. This means that in this time 1 kg of Methane has 72 times the warming potential of 1 kg of carbon dioxide. The number declines when looking at longer periods, Methane's GWP in a 100 year case is 25 and in 500 years it declines to 7.6.¹¹

¹⁰ Original chart can be found in Annex

¹¹ Cf. loc. cit.: IPCC Fourth Assessment Report: Working Group I Report. P. 210 cc.

2.3 Responsibilities of the crisis

When looking at worldwide GHG emissions it is important to distinguish between the emissions caused by industrialised and developing countries. For that purpose the UNFCCC has divided countries into Annex I, Annex II and Non-Annex countries. This classification was chosen specifically with the Kyoto protocol in mind and the overall aim of setting binding emission abatement targets. Within the Annex I group are “industrialised countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States”.¹²

Annex II is a further differentiation of Annex I countries. In Annex II are additionally all countries that are OECD members from Annex I but none of the countries which are also classified within the EIT group. The Annex II countries “are required to provide financial resources to enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change. In addition, they have to ‘take all practicable steps’ to promote the development and transfer of environmentally friendly technologies to EIT Parties and developing countries”.¹³ The Non-Annex I countries (automatically Non-Annex II countries as well) “are mostly developing countries”.¹⁴ The definition also splits the group into countries which are more affected by climate change due to geographical characteristics such as rising sea levels, and countries which will be more affected by economic implications of the crisis. The UNFCCC hence promises the Non-Annex countries supporting activities such as investment and insurance. These definitions highlight the responsibility role of industrialised Annex I parties towards climate change issues within their own countries but additionally towards developing countries. The UNFCCC acknowledges industrialised countries as the main initiators of climate change and transfers worldwide responsibility onto them.

This is also backed when looking at assembled percentage contributions to global warming. Accordingly the biggest contribution is made by the USA with 30.3%, followed by Europe with an impact of 27.7%. This already accounts for two thirds

¹² The UNFCCC website, Parties and Observers 2010. at <http://unfccc.int/> (28.07.2010)

¹³ The UNFCCC website, Parties and Observers 2010. at <http://unfccc.int/> (28.07.2010)

¹⁴ The UNFCCC website, Parties and Observers 2010. at <http://unfccc.int/> (28.07.2010)

generated solely by advanced countries. Africa and South America together account for only 5.3%. Russia and the rest of the Asian continent account for 29.6%.¹⁵

The Greenhouse Development Rights framework, which serves as a supplementary framework to the UNFCCC, has divided produced emissions into excluded emissions and responsibility emissions. Excluded emissions are emissions which are necessary for a country to provide survival and basic economic development, and responsibility emissions are accordingly the emissions that do not necessarily need to be produced by a country to secure survival. Not surprisingly the responsibility emissions of advanced nations exceed by far their excluded emissions and vice versa for economies in transition and developing countries. A chart displaying the calculated emissions for selected regions and countries can be found in Annex under Figure 2. The by far largest responsibility emissions are caused by the United States with only a small share of excluded emissions. China follows the USA closely in terms of overall emissions, but the majority of their emissions account for excluded emissions and only a minor share of responsibility emissions.¹⁶

2.4 The Kyoto protocol

The Kyoto protocol, ratified in December 1997 in Kyoto, serves, like named above, as supplementary protocol to the UNFCCC. It is an internationally legally binding agreement for 37 industrialised countries and the European community to reduce GHG emissions by an average 5% in the period 2008 to 2012. The protocol acknowledges the main originators of global warming and climate change to be the developed nations and places more responsibility on them under “the principle of common but differentiated responsibilities”.¹⁷ The protocol expects countries to meet their set abatement targets mainly through national measures but additionally offers some instruments supporting these targets. Namely they are Emissions trading, Clean development mechanism (CDM) and Joint implementation (JI). While Emissions trading will be taken up in chapter 3.2, CDM and JI will be explored

¹⁵ Original figure can be found in Annex under figure 7. Cf. *An Inconvenient Truth*. Guggenheim, Davis; Gore, Al. 2006.

¹⁶ Cf. Baer, Paul; Athanasiou; Kartha, Sivan: *The right to development in a climate constrained world*. The Greenhouse Development Rights Framework 2008. p. 53 cc.

¹⁷ Cf. UNFCCC: *Kyoto Protocol to the United Nations Framework Convention on Climate Change*. 1998. Article 10. <http://unfccc.int/> (29.07.2010)

shortly. The CDM instrument gives Annex B countries¹⁸ the opportunity to invest in the implementation of emission abating projects in developing countries which will then earn them the so called saleable certified emission reduction credits each worth one tonne of CO₂ to put towards their own emission target. This mechanism is on the one hand able to provide support for developing countries in their economic transition process but it is also enabling developed countries to actually emit above their respective emission target themselves. The JI mechanism operates fairly similar. An Annex B country can buy emission reduction units, which can again be put towards their own emission target, by implementing an emission reducing project located in another Annex B country.¹⁹

This mechanism creates a very attractive situation for both countries. Due to increasing marginal costs of emission abatement in their own country, it is economically cheaper to invest in another country and “buy” the emission reduction units. The host country profits from the sale of emission reduction units and the incoming technology transfer. The worldwide emission target will not change due to this transaction; the idea behind the mechanism is that it does not matter where emissions are reduced but that they are reduced in the first place.

Controversial are the CDM projects in developing countries which include only reforestation. Because carbon dioxide is absorbed in higher quantities by larger forests, these projects will earn the Annex B country certified emission reduction credits, but the carbon dioxide might still be re-released if these forests are affected by forest fires and decomposition.

The Emission targets of the separate countries are kept track of with a registry system and the publishing of annual emission reports by the countries.

In 2012 the binding power of the Kyoto protocol will end and so far there has not been agreed upon a successive agreement. Since the Copenhagen climate change conference in December 2009 did not lead to any further treaty, the next opportunity to decide on further reductions and a binding treaty will be in Mexico at the Cancun climate change conference from 29th of November to 10th of December 2010.

¹⁸ Annex B countries are all countries which entered into a binding abatement agreement in the protocol. These are the Annex I countries, excluding Belarus and Turkey, and additionally including Croatia, Slovenia, Monaco and Liechtenstein.

¹⁹ Cf. UNFCCC website, Kyoto Protocol, 2010. <http://unfccc.int/> (29.07.2010)

2.5 The two degree threshold

For some years now there has been scientific consensus on the so called two degree threshold. Global warming and climate change can only stay within the realms of controllability if temperatures do not rise more than 2 degrees compared to pre-industrial times. This is considered the threshold which could still be manageable by humankind. This stabilisation to 2 degrees needs to be achieved by 2015 with a subsequent decline in emissions to avoid further warming and avoid further damage and consequences. In the fourth assessment report of the IPCC, the institution emphasised that “if warming is not kept below the two degrees centigrade, which will require the strongest mitigation efforts, and currently looks *very unlikely* to be achieved, then substantial global impacts will occur, such as species extinctions, and millions of people at risk from drought, hunger, flooding”.²⁰ Translating the IPCC scale of risk into percent, this means that they consider there only being a 1% to 10% chance of achieving the avoidance of further temperature increase. And already a two degree raise of global temperature will have severe consequences, mainly for developing countries. Projections include water shortages for Africa that will affect up to 600 million people, water shortages in Asia affecting a probable one billion people and coastal flooding, and scarce water for 77 million people in Latin America. But advanced countries will also face extreme changes such as increasing heat waves and flash flooding in Europe, more severe weather events like hurricanes in North America and a growing number of heat deaths in Australia and New Zealand.²¹ Agriculture will be affected and will on the one hand suffer due to irrigation problems in hot countries, while on the other hand crop harvest might increase in colder countries because of the warmer climate. Apart from extreme weather conditions there will be rising sea levels worldwide which will be a very real threat to European countries like the Netherlands, the United Kingdom and Germany.

While many people are loosing confidence in the possibility of still reaching the two degree target, the Greenhouse Development Rights framework still believes this target can be achieved with a sharp change in current policies. They have created an ‘emergency pathway’ for Annex I countries, which entails an annual decline of emissions by 6% from 2010 onwards. The dilemma they identify in their emergency

²⁰ IPCC Press Release: IPCC report shows climate change is taking hold 2007. <http://www.rgs.org/> (03.08.2010)

²¹ Cf. Milmo, Cahal: Too late to avoid global warming say scientists. The Independent 2007. at: <http://www.independent.co.uk/> (30.07.2010)

plan is the scarcity of emissions which remain for the developing countries to emit for their own economic development. The table displaying the emergency plan and developing countries dilemma can be found in Annex under Figure 3.²²

It can be established that while opinions on the achievability of the two degree target are diverging, the only possible path of trying to reach it is a rapid decline in emissions.

3 The United Kingdom's recent climate policy

3.1 The Climate Change Act of 2008

The British Climate Change Act of the 26th November 2008 is the first long-term binding act worldwide which specifies carbon reduction goals. The Climate Change Act provides the framework which obliges the United Kingdom to reduce its emissions of the six Kyoto Greenhouse gases by 80% until the year 2050 against the baseline of 1990. The Climate Change Act resulted from the Climate Change programme first established in 2000, then reviewed in 2006. The general aim of the programme is to cut emissions not only by the established 12.5% UK target as set in the Kyoto protocol, but to cut emissions by 20% until 2010 (compared to the base year 1990). This aim is meant to be achieved by working on several issues such as renewable energy technologies, energy efficiency and establishing a leading role of the public sector. Implemented measures include a climate change levy which is a tax that is imposed on energy used by industrial non-domestic consumers. Another measure is the Renewable Obligation from 2002 which requires energy suppliers to provide a set amount of their energy via renewable energies. This amount is increasing annually with the latest announcement in 2006 being that the target for the 2020-21 period is a 20% share of clean energy. The programme furthermore specifies international targets that include supporting international cooperation, strengthening the European Union Emission Trading System (which will be referred to in the next chapter), achieving a consensus on the action needed and supporting developing countries in the climate change process.²³

The resulting Climate Change Act of 2008 means to transform the United Kingdom into a low-carbon economy and to improve the carbon management. One intended

²² Cf. loc. Cit.: Baer, Paul; Athanasiou; Kartha, Sivan: The right to development in a climate constrained world. p. 14 cc.

²³ Cf. HM Government: Climate Change: The UK Programme 2006. Norwich 2006.

effect by passing the Climate Change Act was to clear the path for an internationally binding agreement on reduction of GHG emissions, which was supposed to be agreed upon at the Copenhagen Climate Summit in December 2009. Unfortunately no framework was developed and consented, but still the Climate Change Act positions the United Kingdom clearly as a leading nation tackling these issues.

Other key provisions of the Act are apart from the ultimate 80% cut in emissions, also an abatement in emissions of 34% by 2020, again compared to the year 1990. Additionally the independent body of the Committee on Climate Change was instituted to support the government on key issues. This Committee is responsible for the carbon budgeting system which sets out a carbon budget for a five year period to help meeting the 2050 emission reduction targets. The Climate Change Act also obligates the Committee to publish annual reports on the progress of the set goals and the likelihood of meeting the final reduction targets.²⁴

Although the Climate Change Act is a very ambitious and pioneering official act, the question of sanctions in case of violating the set targets remains open. Nonetheless it serves the purpose of a motivating example to other nations.

3.2 European Union Emission Trading System

3.2.1 Implementation in the European Union

The European Union Emission Trading System²⁵ (EU ETS) is the largest multinational upstream emission trading system in the world. It was introduced as part of the policy regulations of the European Union to reach the national emission abatement targets. The EU ETS was developed independently from the Kyoto protocol and its obligations to all Annex I countries, but the EU has accepted the Kyoto mechanisms CDM and JI. This means that carbon reduction units earned under the Kyoto protocol can still be transferred to the EU ETS and put towards its emission targets. The introduction of the system is based on the European Directive 2003/87/EC which entered into force in October 2003. The general European Union agreement is set at a reduction of greenhouse gas emissions by 8% below the 1990 level. The different country commitments may vary, with the United Kingdom agreeing to a reduction of 12.5%. The first phase of the EU ETS was conducted from

²⁴ For more information on the first report of the Committee on Climate Change visit www.theccc.org

²⁵ Formerly “European Union Emission Trading *Scheme*”

2005 to 2007. Currently the second phase of the scheme is in action, it runs from 2008 through to 2012.

Every country has to develop and decide upon a National Allocation Plan (NAP) which has to be approved by the European Commission.²⁶

In the NAP, each country has to specify the whole amount of emissions it plans to produce and how the respective emission allowances will be distributed among the permitted installations. Each NAP must be in line with the EU Directive and the Committee might reject plans due to non-alignment with the Directive. The Committee might also suggest necessary amendments. The National Allocation Plans from all participating European countries then create the overall cap for the system-wide emissions. This cap is then divided into allowances which are distributed among all countries. One allowance is set as one tonne of CO₂. The respective national government can then decide whether it wants to allocate these allowances for free to the installations in need or by selling them. After one year each installation is required to surrender the allowances according to the emitted carbon dioxide. If an installation has emitted less it can sell the surplus allowances, if it has emitted more it has to buy the required allowances. But since the international and national cap is set, installations can only buy as many allowances as the market offers. This ensures that the cap is not surpassed. The scheme covers the main electricity generating and emission-intensive industries such as power stations, refineries, iron, steel, cement, glass, food and the automobile sector. The scheme covers about 45% of all European Union member states carbon dioxide equivalent emissions. As already mentioned, the first phase of the EU ETS lasted for three years from January 2005 to December 2007. The first phase can be described as a “learning-by-doing” tryout. During the first phase the necessary infrastructure for an international emission trading system was established. Additionally the data and strategies for emission monitoring, accounts and registries were collected. Another main achievement of phase one was the transformation of corporate involvement in climate change due to the scheme. 70% of participating companies stated that they are now using allowance value in their daily operations and all industries are now viewing it as an important factor in long-term decisions and operation planning. Figures about the actual emission abatement in phase I are not satisfactory. Due to uncertainties in data collection, monitoring, evaluation and growth projections the

²⁶ Cf. Department of Energy and Climate Change, EU Emission Trading System 2010. <http://www.decc.gov.uk/> (01.07.10)

final real abatement can not be assessed properly. But emissions in 2005 were 3.4% below the estimated figures. Additionally the allowance prices on the market were increasing during the first phase which also suggests emission reduction.²⁷

For the second phase it is anticipated that the stricter regulations regarding the available allowances will cause shortages for many big operators. But the final assessment of the second phase can only be made when it will come to a close in December 2012.²⁸

And also, as explored before, due to the acceptance of the Kyoto mechanisms CDM and JI it is possible for a country to actually emit more than in the preceding phase because of the possibilities to “buy” more emission certificates when investing in another country.

The third phase of the scheme beginning in January 2013 is expected to include aviation in the system as well which will lead to more emission coverage.

3.2.2 Implementation in the United Kingdom

As mentioned before, the UK Kyoto target is 12.5% reduction in emission by 2012 compared to the 1990 baseline. Additionally the UK domestic abatement target is a 20% reduction by 2010. The United Kingdom's National Allocation Plans can be accessed online at the DEFRA website, the publishing institution, and the Department for Energy and Climate Change website. For the first phase of the EU ETS scheme, the UK calculated 736.3Mt CO₂ (Million metric tons of carbon dioxide equivalent) to be emitted and allocated to the registered installations over the whole period of three years. Allocations were made in two steps. First the emissions for each sector were set and then the allowances were distributed within the sector to each of the individual plants for free. Subsequently the allowances were given in three annual instalments. From the 100% of calculated and granted allowances, 6.3% remained in a new entrant reserve for installations only entering the scheme in phase I. For new companies, these allowances were allocated free of charge as well

²⁷ But allowance prices were declining steeply during the last six months of the first phase due to non-transferability of the allowances through to the second phase. This system should maybe considered to change since companies that achieved real emission reduction will not be able to sell their surplus allowances profitably. This could be viewed as a demotivating factor towards further abatement efforts.

²⁸ Cf. Tietenberg, Tom: European Union Emission Trading Scheme. The Encyclopedia of Earth 2009. <http://www.eoearth.org/> (02.07.10)

but all allowances remaining in the reserve were auctioned. Added to the new entrant reserve were also allowances of companies which ceased to produce.²⁹

In phase II the covered total emissions increased slightly. While in phase I the covered emissions were a little less than 50%, due to expansion of the scheme in phase II, the covered emissions now amount to 52% of all UK emissions. In phase I the UK had an annual cap of 245.4Mt CO₂, in phase II the annual cap of emissions amounts to 246.2Mt CO₂. This increase is justified in the expansion of the scheme. When looking at the annual allowances that would have been permitted under the phase I conditions, then an annual cap of 219.3Mt CO₂ results which is a decrease in emissions of 11.9%.³⁰

But it has to be kept in mind that through CDM and JI the actual British emission abatement may be much lower.

The following chart outlines the greenhouse gas emissions and the projected emission until 2020. The blue graph illustrates the development of UK emissions from 1990, which is base year for all abatement targets, to 2006. From 2006 onwards there are two graphs, the red one displaying the probable development with no implementation of climate change programmes and the green one illustrating the estimated development with the implementation of the 2006 policies and measures.

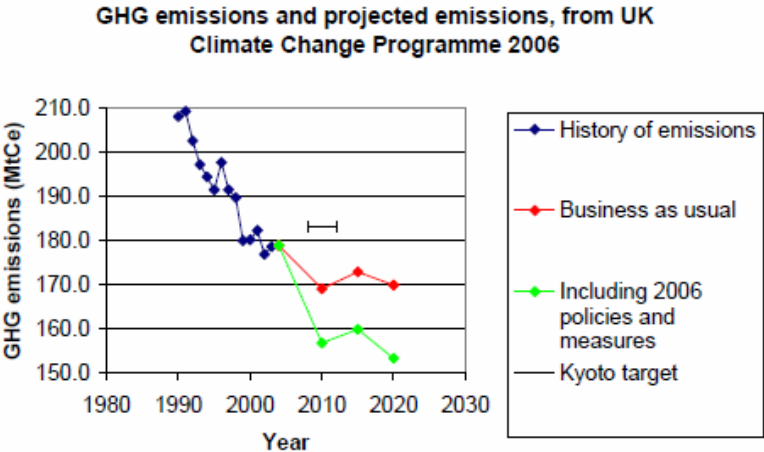


Figure 2: GHG emissions and projected emissions, Approved UK Phase II National Allocation Plan. Department for Environment, Food and Rural Affairs 2007. p. 14

²⁹ Cf. Department for Environment, Food and Rural Affairs: Approved National Allocation Plan 2005-2007. May 2005. <http://www.decc.gov.uk/assets/> (02.07.10)

³⁰ Cf. Department for Environment, Food and Rural Affairs: Approved National Allocation Plan 2008-2012. March 2007. <http://www.decc.gov.uk/en/content> (02.07.2010)

This figure expresses emissions in million tonnes of carbon equivalent (MtCe); one tonne of carbon is contained in 3.67 tonnes of carbon dioxide. This means that total annual 1990 emissions of 210 MtCe, as shown in the figure, equal 770.7 Mt CO₂.

The chart refers to the measures set in the Climate Change Programme of 2000 and 2006, including EU ETS, which were referred to earlier. The projected emission abatement was assessed and calculated by the UK Interdepartmental Analyst Group.³¹

The figure displays double the emission savings as specified in the Kyoto protocol. The streak displaying the Kyoto target is set at the agreed height of emission reduction and at the length of the treaty period (2008-2012). With the agreed reduction of 12.5%, emissions would, in 2010, still amount to about 183MtCe. The chart displays double the emission target amount at an estimated 157MtCe in 2010, which accounts for a 23% reduction. These reductions estimates for 2010 were backed by a report of the Department of Energy and Climate Change in 2009.³²

The impact of the so far implemented climate change programmes in the UK is, according to this chart, considerable and amounts to a reduction of more than 10 MtCe in 2010 and nearly 20 MtCe in 2020.

3.3 London congestion charge and the fuel escalator

The following paragraph on the London congestion charge and the British fuel escalator is meant to provide examples of implementing large scale concepts within the British society which might be comparable to the implementation process of a personal carbon trading scheme.

The London congestion charge was implemented in February 2003 and has since then been operated by the central London transport authority, the Transport for London organisation, TfL. The congestion charge is a levy which is charged on all vehicles entering the congestion area weekdays from 7.00 am to 6.00 pm. The congestion area includes central London, driving on the boundary roads of the zone is not chargeable. The daily charge for entering the congestion zone is at 8£ but increases if not paid in advance or shortly afterwards. The penalty charge is set at

³¹ The report also states that while the measures will have an impact beyond the year 2010, predicted emissions between 2010 and 2015 will increase due to economic growth.

³² Cf. NewEnergyWorldNetwork.com: UK on track to double Kyoto target, according to Department of Energy and Climate Change. June 2009. <http://www.newenergyworldnetwork.com> (01.08.2010)

120£, decreasing to 60£ if paid within two weeks of notice. Interesting to note about the operation of the congestion charge are the technical requirements. While the recording of the vehicles entering the zone is done with several surveillance cameras situated at the borders of the zone and within, the matching of the recorded vehicle number plates to the remunerated vehicles is done at a central London data base. Payment of the charge can be done via several channels, namely online, by mobile texts, phone, automated telephone services, at shops and by post. Notable about this scheme is the cooperation of private and public organisations to organise and operate this system. The variable payment methods also highlight the technical capabilities of implementing a large scale concept as this. Effects of the London congestion charge included a significant drop in emissions and improvement of air quality within the zone.³³

Apart from the technical requirements and operation of the scheme, which is different then it would be for a personal carbon trading scheme, it is interesting to note the quick public acceptance and familiarization with the scheme.

The fuel price escalator was implemented in the UK in 1993 by the Conservative government. It is basically a fuel tax on hydrocarbon oil which entailed the special feature of increasing annually. The escalator was introduced to reduce car use for abatement reasons and to raise money. When the tax came into action in 1993, British fuel was ranked as third cheapest worldwide. Due to the increasing annual prices it is now one of the most expensive fuels. The fuel escalator increased tax on fuel by 3% above inflation levels annually from 1993 to 1997 and as high as 6% above inflation from the years 1997 to 1999. In 2000 the high fuel prices led to the so called fuel protests all across Britain which eventually led to the abandoning of the tax. The price increase peaked in mid 2000 when fuel prices had risen more than 100% from 1990 levels. The litre was worth 40p in 1990 and peaked at 84.3p in July 2000. After abandonment of the escalator, fuel prices decreased again.³⁴

Figures regarding emission abatement due to the fuel escalator are not available but since fuel consumption decreased due to high prices, some abatement should have been achieved. On the other hand the high fuel prices may have had less impact

³³ Figures regarding these emission cuts vary and have decreased since the implementation of the scheme. The zone has also been expanded westwards in 2007 to cover a greater area. Further information can be taken from the annual TfL monitoring reports accessible at www.tfl.co.uk

³⁴ Cf. Leicester, Andrew: Fuel Taxation. The Institute for Fiscal Studies, Briefing Note No. 55. p. 2

because low-income households that were particularly affected by the tax did not own a car and were therefore in no position to buy less fuel. Middle and high income households are more likely to accept an increase in fuel prices and were not reducing their emissions.

Although the fuel escalator was in action for nearly ten years its impact has to be assessed as not completely satisfactory. Additionally the population was naturally not content with the constant raise in fuel taxes and was given no alternatives such as improved public transport and tax incentives for buying a less fuel consuming car.

4 Financial market crisis in the United Kingdom

4.1 Financial market crisis and structural causes in the UK

The impact of the financial market crisis has been palpable in all European countries. The United Kingdom is no exception and in some ways has experienced an even greater impact due to its extensive financial sector. The British economy is one of the biggest worldwide and dominates together with Germany and France the European Union. The Gross Domestic Product, GDP, declined by \$0.108 trillion in 2009 compared to 2008, this is a GDP downturn of 4.8%. Nonetheless in 2009 the UK was still ranked as the 7th biggest economy worldwide. Repercussions of the financial market crisis included a significant increase of unemployment, in 2009 at an estimated 8%, risen by 2.4% from 2008.³⁵

Linked with this development is the trend towards a growing division between upper class and people living in poverty, which is still currently taking place.

Previous to the financial market crisis, the United Kingdom experienced the creation of a so called housing bubble similar to developments in the USA. From 1998 onwards, British property prices rose at significant levels and peaked in 2007 with prices that had increased more than 150% compared to the 1998 base. This development was accompanied by a sharp increase in mortgage lending. Between 2001 and 2007 many lending companies started granting mortgages at amounts that were multiple times the incomes of the respective borrower. Additionally, mortgage lenders which did not require any deposits started to operate. Nonetheless property

³⁵ Cf. The CIA World Factbook: <https://www.cia.gov/library/publications/the-world-factbook/geos/uk.html> (19.06.2010)

prizes were still increasing, which led to the majority of low income people not being able to buy. This resulted in the construction of thousands of new houses annually by order of the British government to keep the rising estate prizes at bay.³⁶

Furthermore the United Kingdom depends heavily on its financial sector. Industry jobs in the UK declined by 30% over the past ten years and most of these jobs moved to the expanding financial sector. This decrease is especially high when comparing to other EU countries like Germany, whose decline of industry employment was only 5%, and France with a decline of 10%.³⁷

In 2009 the UK financial services sector employed around 4.2% of the workforce, each employee adding more than double the economic output than the British average, with about 35,000 companies operating in the sector. London became a financial centre of the world among other financial hubs as New York, Mumbai, Frankfurt and Paris. With the growth of the financial sector came the expansion and significant involvement of UK banks in the securitised credit market and shadow banking activities. With increasing entanglement of the major UK banks in the international banking sector, the involvement in intra-financial assets and liabilities, which were difficult to see through, arose and were based on unsecured credits with high default risks. The financial sector of the United Kingdom was therefore affected in the same ways as the USA's. Banks suffered from a loss of public confidence, decreasing liquidity and declining asset prices. The UK also experienced a steeply rising current account deficit from 2003 to 2006. This was mainly caused in the rapid credit market expansion which led to extended macro-economic imbalances. Other factors for the rapid growth of the market were the large foreign direct investments and capital inflows. The Turner Review of the Financial Services Authority summarizes the UK specific characteristics in the following points.

Firstly the breakdown of the major bank Northern Rock that resulted from the depleting securitised credit assets.

Secondly the occurrence of notable losses of all major British banks who had been involved in the securitised credit intermediation.

³⁶ Cf. Chamberlin, Graeme: Recent developments in the UK housing market. In: Economic & Labour Market Review, Vol 3, Nr. 8, August 2009.

³⁷ Cf. Schwarz, Peter: Europa in der Krise. World Socialist Web Site 2010. [http://www.wsws.org/de/2010/\(15.07.2010\)](http://www.wsws.org/de/2010/(15.07.2010))

And lastly the resulting economic downturn, which disclosed the risky nature of many granted credits and mortgages, that lead to a deterioration in credit worthiness.³⁸

The regulatory approach of the Financial Services Authority (FSA), which had been very liberal before the crisis, is also responsible to some extent for the great impact the crisis had on the British economy. Although the FSA did supervise the necessary institutions with a clear set of rules, the overall approach has been described as a 'light touch' by some. The very liberal philosophy of the FSA included the faith in self-regulating markets, risk management at top management level and customer protection which was best insured by free markets. If the FSA would have regulated the mortgage securitised market in a stricter manner then maybe the web of financial linkages would not have been as turbid and some of the big banking institutions might have left the market.³⁹

4.2 Impact of the financial market crisis on the public sector

Although the UK is still one of the biggest economies worldwide, the United Kingdom is also becoming one of the most indebted countries. Since the relatively great impact of the financial market crisis has hit Britain, the government was forced to approve several economic packages and British national debt has gone through the roof. Government deficit and national debt have increased sharply from 2008 to 2010. While in 2007 the government deficit was at about 2.8% of GDP, it rose to 11.4% in the year 2009. The same applies to the national debt of the United Kingdom, while in 2007 the national debt was at about 45%, it increased to 68% in 2009 and is likely to rise even higher this year with more debts to encumber. With these figures the UK is already violating the Maastricht Treaty's targets of 3% for governmental deficit and 60% of national debt.⁴⁰

To highlight the impact of the financial sectors support on these figures it is interesting to look at the national debt figure where financial sector interventions are subtracted, which would result in national debt being 54%. This means that net debt of 14% of the GDP was necessary to stabilise the financial sector with bail outs of the

³⁸ Cf. The Turner Review: A regulatory response to the global banking crisis. Financial Services Authority 2009. p. 29 cc.

³⁹ Cf. loc. cit.:The Turner Review: A regulatory response to the global banking crisis. p. 86 cc.

⁴⁰ Office for National Statistics, Economy 2010. <http://www.statistics.gov.uk/cci/nugget.asp?id=277> (08.07.10)

big British banking institutions like Northern Rock, Royal Bank of Scotland and many more.⁴¹

4.3 Correlations between financial and environmental crisis

At the surface there is no obvious connection between the financial market crisis, which only occurred in the last 3 years and is now mostly overcome, and the environmental crisis which is only now unfolding with all its implications for the future of our planet. Still it is worthwhile to think about possible correlations between the two fundamental challenges of our century.

The German Council of Sustainable Development⁴² has summarised some main aspects where more sustainability might have prevented the financial crisis or at least reduced its impact. These aspects include the rising energy, food and raw material prices, the development of the speculation and housing bubble and overcapacities in industries like the automobile sector.

The financial crisis has been triggered by the subprime crisis in the USA where housing credits were granted without the necessary verifications of creditworthiness. This led to increasing default risks which were spread among a range of artificial finance vehicles. The granted credits were used to build properties that often exceeded the financial capabilities of most borrowers. This model was working under the condition of low interest rates on the borrowed amounts and low energy prices for heating, air conditioning and electricity. Most homes were additionally located far away from city centres which led to the dependence on low fuel prices as well. When energy prices started to increase this was directly palpable in the inhabitants' incomes since they were dependent on their homes and cars in their daily life. Eventually the interest rates increased as well which directly resulted in many borrowers defaulting on their credit obligations and heralded the beginning of the financial crisis. Although the financial crisis would have probably ensued with another trigger as well, the subprime crisis is an ideal model for looking at linkages between more sustainability and the economic crisis. If the USA would have already been in a state where a higher share of the energy demand was covered by renewable energies, then the rising fossil fuel prices would have been partly offset by the

⁴¹ Cf. Economic Help: UK National Debt. At: <http://www.economicshelp.org/blog/uk-economy/uk-national-debt/> (08.07.10)

⁴² Rat für Nachhaltige Entwicklung

constant green energy prices. The aforementioned oversized properties additionally required more energy than would have been needed if more suitable homes were built. Lastly the lacking public transport infrastructure resulted in intensified car travels and subsequently more fuel consumption and CO₂ emissions.⁴³

The general credit financed consumption in the USA also led to astronomical deficits in the US-American trade balance. Their trade balance has been negative since 1991 but peaked in 2006 at an amount that accounted for 6% of the GDP.⁴⁴

This increasing trade deficit was also caused to a large extent by the growing energy demand and import. In the last decade the value of fossil fuel imports by the USA has quintupled.⁴⁵

Another correlation between the impact of the financial crisis and the lack of beforehand implemented sustainability ensuring measures can be established when looking at industries with relatively old-fashioned production processes and overcapacities. The automobile sector is one of these industries and has been hit stronger by the economic recession than other industries. Especially the US-American automobile companies were not prepared for the shift in consumer demand which was caused by rising fuel prices. Consumers needed cars with low fuel demand which left the automobile companies with whole product families becoming unsalable due to their high fuel consumption characteristics. This situation exposed also the failure of the automobile companies to invest earlier in sustainable technologies. If investment in Research & Development of new green automobile technologies would have been enacted earlier then the whole sector might have been in a more flexible and relaxed position to react to the changing demand. Still it has to be noted that although a previous shift towards more sustainability might have cushioned the blow for the automobile industry, all durable consumer goods are affected at a greater extent by an economic recession, in contrast to short-lived consumer goods, because their purchase can usually be deferred infinitely.⁴⁶

Another parallel between the two recent crises arises when looking at the time horizons of both. While reacting to climate change requires a long-term time window, the finance markets of recent years have only been honouring business operations

⁴³ Cf. Görlach, Benjamin; Meyer-Ohlendorf, Nils; Kohlhaas, Michael: Nachhaltig aus der Krise: Analyse möglicher Beiträge einer ökologischen Finanzreform. Rat für Nachhaltige Entwicklung 2009. P. 5 cc.

⁴⁴ The United Kingdoms government deficit was at 2.8% in 2007 as mentioned before.

⁴⁵ Cf. Loc. cit.: Görlach; Meyer-Ohlendorf; Kohlhaas: Nachhaltig aus der Krise: Analyse möglicher Beiträge einer ökologischen Finanzreform. P. 9 cc.

⁴⁶ Accompanying the old-fashioned production operations are overcapacities of up to 20% in the automobile sector.

which were based on short-term profit targets. Shareholder value maximisation has become the most important operational planning factor and has prevented companies from long-term planning. With short-term planning objectives walking along were the increasing risks of the various financial derivatives. To prevent the financial market crisis it would have been necessary to concentrate on and plan with long-term objectives, renounce short-term profit opportunities where required, and reap value creation and profits in the long run. The same applies for the environmental crisis we are facing at the moment. To successfully reduce the impact of climate change and prevent further impact in the future, short-term targets need to be set aside to concentrate on long-term goals which will lead to more environmental and economical sustainability.⁴⁷

Additionally the speculative bubble which ensued partly because of an increasing number of private investors might have been reduced if shareholders would be given other investment opportunities. Governments could have encouraged investors to finance green projects like solar plants which might not generate short-term profits but are certain to provide profits in the long-run and on a more risk-free and sustainable basis. Households that already provide for their own energy needs with a photovoltaic roof installation were not affected as much by the rising energy prices. Households which do not own cars but are travelling with public transport or bicycles are not affected by volatile fuel prices. If measures like these would have been taken up by the majority of a country's population then rising fossil fuel prices would not be able to trigger a crisis as severe as the current one.

Still it has to be noted that while it would have been all very well for one country to be on the way to a more sustainable low-carbon economy, it would have been affected through the interconnections to other countries. Our current economic system has cross-linked all countries with various trade connections so that one country would have needed to operate completely autarkic to prevent experiencing any repercussions.

Cf. Loc. cit.: Görlach; Meyer-Ohlendorf; Kohlhaas: Nachhaltig aus der Krise: Analyse möglicher Beiträge einer ökologischen Finanzreform. P. 5 cc.

5 Approaches to Personal Carbon Trading

5.1 Development of the scheme

Personal carbon trading is a concept which has emerged in some form or another over the past decades. Since it has become clear and obvious that emission cuts also need to be made in the household and domestic sector, different ideas and approaches have been brought forward. The different concepts, which are considered today when thinking about a personal carbon trading scheme, will be explained in the following chapter. Basically, personal carbon trading is the idea of individuals being given responsibility for their own carbon emissions, achieving monetary incentives if emitting less and losing their incentive if not adapting. All personal carbon trading concepts place a cap on an economy's overall emissions which serves as the guarantee for reaching the emission abatement targets.

The need for a reduction of emissions emitted by households is inevitable, the only question remains in regard to the means which should achieve this.

The following graph illustrates the composition of the average British carbon emission by an individual in one year.

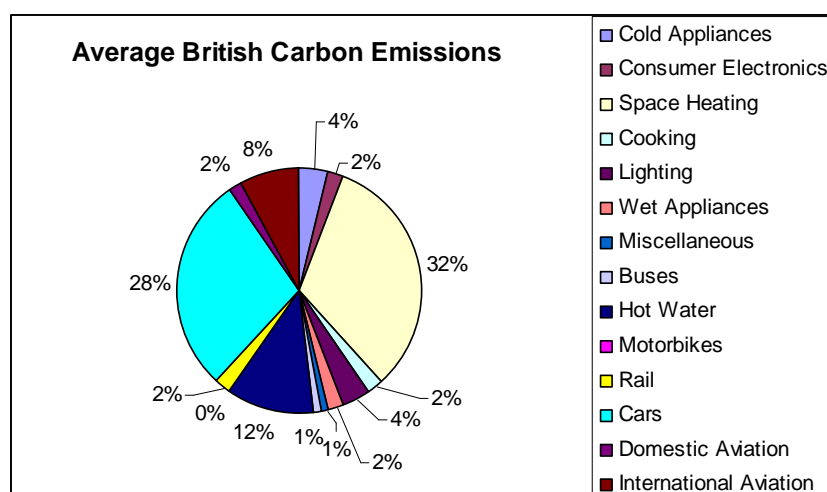


Figure 3: Average British Carbon Emissions, Bird, Jenny; Lockwood, Matthew: Plan B? The prospects for personal carbon trading. London: IPPR 2009, p. 11⁴⁸

All personal carbon trading concepts include fossil fuels in their scheme, which cause the most emissions. Some concepts also include electricity and personal aviation, which then cover all individual emissions apart from public transport. But as depicted

⁴⁸ Original chart can be found in Annex

in the graph above, public transport only accounts for 3% of the emissions, rail and buses. But even a scheme that does not cover personal aviation and public transport would still be able to affect 87% of the emissions. Additionally over the past years emissions from personal use did not decline compared to former years.

So far the scheme has been investigated and evaluated in various studies in the UK, initiated by institutions such as the Department for Environment, Food and Rural Affairs (DEFRA), the Tyndall Centre for Climate Change Research, the Centre for Sustainable Energy (CSE) and the Institute for Public Policy Research (IPPR). The current state of debate on personal carbon trading will be subject in chapter 9.3.

The next subchapter will explain in detail the Tradable Energy Quotas scheme developed by David Fleming, which will also be the basis for further investigation into personal carbon trading. To gain a comprehensive overview of all current personal carbon trading schemes, subchapters 5.3 and 5.4 will differentiate the other common schemes.

5.2 Tradable Energy Quotas by David Fleming

The concept of Tradable Energy Quotas, TEQs⁴⁹, was created and developed by David Fleming, a British environmental thinker and writer, in 1996. He also founded the Lean Economy Connection who publishes his works about the TEQs scheme and other issues such as nuclear energy.⁵⁰

David Fleming's TEQs scheme has since become the most mainstream of the personal carbon trading schemes and has also been developed further by various other proponents. The scheme is explained in detail in his publication "Energy and the common purpose: Descending the energy staircase with Tradable Energy Quotas (TEQs)". The latest revised edition is from September 2007 which will be the basis for the following insight into the scheme.⁵¹

The Tradable Energy Quotas scheme highlights two main reasons for the pending need for energy-rationing and the implementation of the scheme. On the one hand climate change and its implications for all nations and on the other hand the

⁴⁹ Pronounced Tex

⁵⁰ On the Lean Economy Connection's website information about his work regarding TEQs, nuclear and other issues is accessible at theleanecconomyconnection.net

⁵¹ The publication is available for free on the lean economy connection's website

diminishing energy resources. Due to the scarcity of fossil fuels and the resulting monopoly positions of exporting countries, energy shortages are anticipated and societies need to restructure themselves to be able to guarantee a fair distribution in the future.

The basis for the scheme is the measurement of TEQs in units and the according allocation of units to fuels and electricity to create a “rating” of the used good. David Fleming uses the GWP calculation with assigning one kilogram carbon dioxide and the equivalent in other greenhouse gases to each unit to create a comparable basis. On the following table the distribution of the carbon units for the respective fuel can be seen.

Translating Emissions into Fuels

Estimates of the global warming potential (GWP) of gases released by the production and combustion of fuels.
 1 kg carbon dioxide = 1 carbon unit
 The GWP of methane and nitrous oxide is measured as carbon dioxide equivalents.

Fuel	Carbon units
Natural gas	0.2 per kWh
Petrol	2.3 per litre
Diesel	2.4 per litre
Coal	2.9 per kg
Grid electricity (night)	0.6 per kWh
Grid electricity (day)	0.7 per kWh

Table 1: Translating Emissions into Fuels, Fleming, David: Energy and the common purpose: Descending the Energy Staircase with Tradable Energy Quotas. London: The Lean Economy Connection 2007. p. 10⁵²

Accordingly the fuel with the best (lowest) rating is natural gas and the fuel with the worst (highest) rating is coal. This means that natural gas could be consumed in higher quantities than all other fuels before the assigned units are exhausted.

First of all a budget of carbon emission units will then be set. This budget should at the first implementation of the scheme ideally allow the economy to continue with the emission amount they used in previous years, to guarantee a first phase of adaptation to the system. In subsequent years the budget is gradually reduced until the economy has reached all its emission abatement targets and has become a low-carbon economy. The reduction of the budget is set in the TEQs budget plan which is supposed to plan 20 years ahead and is designed in three periods. The first five year period contains a binding commitment for achieving emission abatement goals and

⁵² Original table can found in Annex.

can not be revised. The next five year period should also be inflexible but could be revised in case of major external changes. Period three, a rolling forecast over the next ten years, is meant to provide a guideline and can be revised as needed.

Of the budget as a whole, 40% of the units or permits would be distributed equally on a per-capita basis among the population of the economy. The remaining 60% would be auctioned off to companies, businesses, public and voluntary sectors that must similar to the individuals surrender these permits when buying fossil fuels. The database which would issue these permits is the Registrar, a computer programme that holds all individuals account data and surrenders the permits on a weekly, monthly or yearly basis. The institution which supervises the whole process and sets the carbon budget would be the independent energy policy committee. The general scope of the scheme will include gas, electricity, coal, oil and road fuels.

If a household does not require all of the units it is entitled to, the household can sell the surplus permits and profit from reducing emissions. Accordingly if a household requires more permits than it is entitled to, it can buy the needed permits. This also guarantees a monetary incentive to all households to get acquainted with the system and look for ways to reduce their personal emissions. The only difficulty connected to this procedure is the likely price increase of the permits. Once the budget is decreasing annually, and more people are looking to buy extra permits because this might still be the cheaper option compared to, for example, insulating their home, the price for the permits can increase infinitely. Although at some point the price will be too high for the majority of households, there will still be households who choose to rather buy expensive extra permits than to transform their lifestyles to low-emission lifestyles.

The following chart illustrates the whole TEQs cycle as described.

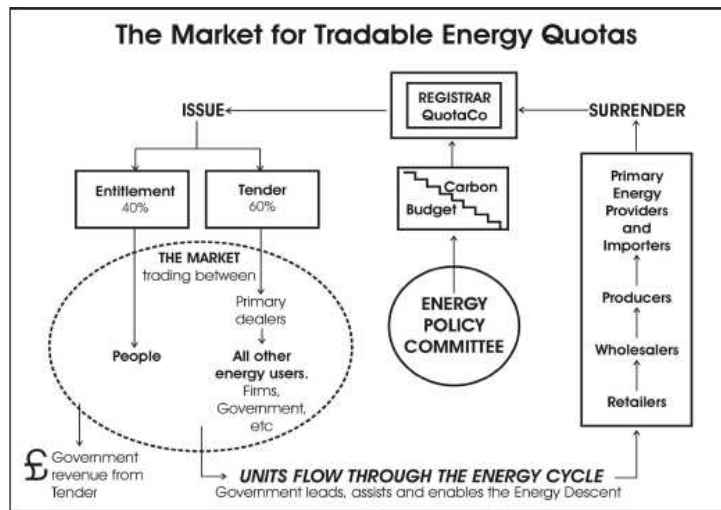


Figure 4: The Market for Tradable Energy Quotas, Fleming, David: Energy and the common purpose: Descending the Energy Staircase with Tradable Energy Quotas. London: The Lean Economy Connection 2007. p. 11

The entitlement of 40% of the whole budget for households is used because household emissions account for about 40% of all emissions in the UK. The remaining 60% of all emissions are produced by companies, businesses, public and voluntary sectors. The auctioning of the remaining 60% of the units will take place via a tender procedure. The circulation of the units could be calculated by banks that open a carbon account that is joined to the individual's or companies normal bank account. When the individual or the company is purchasing goods that require the surrender of units, the process of paying in money and units is the same. Direct debit and credit cards would be connected to both the money and permits account of the purchaser. The transaction then automatically deducts permits from the account and, if not enough permits are available in the account, the process could also go as far as automatically purchasing the needed permits for the sale resulting in a higher payable money amount, a sort of 'pay-as-you-go' method. This proposed procedure would be fairly non-intrusive since the individual does not need to personally get involved in supervising his account and carrying an additional carbon card. On the other hand this approach is also very administration intensive for the involved banks. They will need to create additional accounts for all their customers and distribute new direct debit cards that carry the required information. But while this would be a one-time only issue to solve, the annual cost of installing and operating all the additional accounts needs to be taken into consideration as well. In a recent study from 2009, Jenny Bird and Matthew Lockwood assume the annual banking costs to be in the

region between 14£ and 17.50£.⁵³ These costs only include running a regular current account with no overdraft facility.⁵⁴ The costs of the scheme will be subject to further investigation in chapter 7. Nonetheless it is assumed that implementing the scheme on the basis of the existing direct debit and credit card systems is feasible and will, once set up, be accepted and satisfactory.

But when talking about the costs of the scheme, it must also be noted that the scheme will provide the government with considerable revenues from the tender. Estimates about the amount of revenues vary, considering that the public sector itself will be a buyer of the permits as well.

Other aspects that require some more research and decision making are concerning the just distribution of the permits. How many allowances should children get granted? Should there be extra allowances for people with disabilities who might use more energy and fuel and are in a more difficult position to reduce these emissions? Do people living in rural areas require more permits because they are forced to use their car due to a lack of public transport? These are questions which need to be assessed further and solved through research to create a system that is fair to all people which is essential in gaining public and political acceptance.

Another aspect to consider are tourists visiting the country and temporary residents. In such cases the aforementioned 'pay-as-you-go' method might be a possible solution. People who do not possess a carbon account and therefore no needed direct debit or credit card connected to the account could, when purchasing energy or fuel, pay as they normally would and leave the transaction of buying and surrendering the required permits to the retailer.⁵⁵

The role of the government within the scheme is also an important one. While managing the budget and accounts would be done by banks, the registrar and the energy policy committee, the government needs to educate the population and find ways of personally living with the scheme. As mentioned before, public bodies would also need to buy permits for their needs and seek opportunities to reduce emissions. And since the setting of the annual budget is not within governmental control, it can

⁵³ These costs are particularly difficult to assess because a bank's running costs are spread across a wide range of products and services. Additionally current account costs vary widely from country to country. The stated assumption is based on a study from Oxera conducted in 2006.

⁵⁴ Cf. Bird, Jenny; Lockwood, Matthew: Plan B? The prospects for personal carbon trading. London: IPPR 2009. p. 27

⁵⁵ To consider as well are people with a carbon account on holiday or pensioners living in nursing homes. In such cases, the individual's carbon permits would be surrendered to the respective hotel or institution. Then they would be responsible to manage their guests' carbon budgets.

concentrate on providing transitional help, programmes and initiatives to achieve the successful implementation of the scheme. The generated revenues from the scheme could be used for such supporting activities.

Once the concept is implemented and thriving, it will also set an international pioneer example. If emission abatement is as high as anticipated under the scheme, other nations might adopt the scheme and introduce as well. Then opportunities to link the respective national schemes might become possible and creation of an international scheme.

Other ideas regarding the expansion of the concept are for example proposed by Franz Groll, a member of the German left-wing party. In his book “Von der Finanzkrise zur solidarischen Gesellschaft” (translated: From the financial market crisis to a society of solidarity) from 2009, he explains his concept based on the distribution of environmental certificates.⁵⁶ His ideas go beyond the personal carbon trading concept; he proposes to include every good in an economy in the scheme. This proposal would entail the introduction of the environmental certificates as a second currency. Each product would have a monetary and an environmental value. The environmental value of a product would be the sum of all values of the different producers. Each producer would assess, according to his value creation process, how many emissions he is required to produce in order to operate his business. These emissions would then be translated for each product into its environmental ‘impact’ or value. The final consumer also receives his free share of certificates, but in contrast to the TEQs scheme, he needs to submit certificates for each product and service he consumes.⁵⁷ Franz Groll illustrates his concept by stating that supermarkets would not only denote the products prices in monetary value but also in environmental value and the consumer can always detect how environmental friendly the products he is buying are.⁵⁸

But although ideas and further developed concepts are important, a scheme as comprehensive as the above described one by Franz Groll is probably too administration intensive for both government and businesses.

⁵⁶ „Ausgabe von Umweltzertifikaten“ in German

⁵⁷ The implementation of such a comprehensive scheme would also directly lead to lower consumption and subsequently less production of emission-intensive goods, more investment in environmental-friendly technologies and an expanding service sector.

⁵⁸ The scheme is explained in detail in his book. Cf. Groll, Franz: Von der Finanzkrise zur solidarischen Gesellschaft: Visionen für eine zukunftsfähige Wirtschaftsordnung. Hamburg: VSA-Verlag 2009. p. 49 cc.

Developed on the same basis as the TEQs scheme, is the Domestic Tradable Quota (DTQ) scheme. It is the TEQs predecessor and was investigated and further developed by Richard Starkey and Kevin Anderson and explained and published by the Tyndall Centre for Climate Change Research in 2005 in their Report “Domestic Tradable Quotas: A policy instrument for reducing greenhouse gas emissions from energy use”. The scheme itself is basically the same as TEQs scheme by David Fleming and differs in only one main aspect. Still it is important to mention it as another concept because various studies undertaken by different institutions are normally only looking at one concept at a time.⁵⁹

The one difference between the two concepts is the scope it entails. While TEQs only look at fossil fuels and electricity, the DTQs include personal aviation as well. But the schemes are sometimes mixed in the existing literature and studies which results in some studies stating that TEQs also include personal aviation in the scheme.⁶⁰

5.3 Personal Carbon Allowances by Hillman and Fawcett

Personal Carbon Allowances (PCAs) are a British scheme as well, developed in 2004 by Mayer Hillman and Tina Fawcett. Mayer Hillman works at the Policy Studies Institute in London and Tina Fawcett at the Environmental Change Institute at the University of Oxford. The original idea and theory of the scheme goes back to Mayer Hillman who has been working on it for several years.

The PCAs entail at their core the same concept as the TEQs, still both concepts have been developed independently from one another. PCAs also include the whole economy in the scheme and suggest that also the entitlement for each adult is given for free, while the rest of the available allowances are auctioned off to businesses, the public sector and all other parties. In contrast to the TEQs scheme but in accordance with the DTQs, the PCAs include personal aviation in the scheme. This does not include public transport that is thought to be added to the scheme at a later date once implemented. Since personal aviation would be included in the scheme, the free of charge allocated allowances would be higher than 40%, probably in the

⁵⁹ Literature about the DTQs scheme is not entirely precise about the differences between the TEQs and the DTQs. It was originally the scheme by David Fleming and renamed to TEQs. Still in various studies the DTQs scheme is denoted as a scheme by Richard Starkey and Kevin Anderson.

⁶⁰ Cf. Roberts, Simon; Thumim, Joshua: A Rough Guide to Individual Carbon Trading. Department for Environment, Food and Rural Affairs 2006. p. 8 cc.

region of 50%. Additionally Hillman and Fawcett highlight that children should receive a somewhat lower allowance, possibly only half of an adult's allowance. The technical realisation would also be with the help of the direct debit and credit card system. They propose to introduce a Carbon credit card which would work similar to a normal credit card and could use the already existing technologies. Furthermore it is stated that this should not be very difficult to implement since retailers of fossil fuels are limited and the process is well documented and tracked.⁶¹

5.4 Cap and Share

Cap and Share is a concept developed by the Irish organisation Foundation for the Economics of Sustainability, Feasta. This scheme is slightly different from the previous ones. It does include the whole economy as well; and also set an annual carbon budget, the cap, for the nation. But in contrast to the other concepts, this budget is distributed equally only among all adults of the economy. The fossil fuel suppliers subsequently have to buy these permits from the individuals on a national certificates market to produce their products. To pay for the permits, businesses will increase the prices of fossil fuels, leading to lower consumption of fossil fuels and then lower emissions. Individuals with a low carbon footprint will, similar to the other schemes, profit from this because they can sell all their permits but do not consume as many higher priced fossil fuels as needed to offset their gain.⁶²

Jenny Bird and Matthew Lockwood also note another interesting feature of the scheme. Because the budget of the economy is solely controlled by all individuals in the country, some might choose not to sell their permits and destroy them. This would additionally lead to decreasing emissions.⁶³

One big advantage this scheme offers, compared to the previous concepts, is the simplicity of its implementation. There would be no need to introduce new accounts or cards. Furthermore it leaves the freedom to individuals not willing to participate. People would have the option of ignoring their carbon certificates and just accept the higher prices they would have to pay for fossil fuels. An auction where millions of individuals want to sell their certificates requires a lot more administrative control.

⁶¹ Cf. Hillman, Mayer; Fawcett, Tina; Rajan, Sudhir Chella: How can we save the planet: Preventing global climate catastrophe. New York: St. Martin's Press 2008.

⁶² Cf. Feasta: capandshare.org (28.06.10)

⁶³ Cf. loc. cit.: Bird; Lockwood: Plan B? The prospects for personal carbon trading. P. 52

This could be limited if the auctioning of the permits would be done by banks or other intermediaries rather than the individuals themselves.

On the other hand, one disadvantage results for companies that would be dependent on these certificates. Since individuals are not forced to sell their certificates, some might not because of ecological or lack of interest reasons, it could be very difficult for companies to assess the amount of certificates on the market. If the available permits are lower than anticipated, prices could increase sharply. This might lead to companies having to leave the market and the development of monopoly positions for big fossil fuel companies.

5.5 Ayres, Rate All Products and Services, Cap and Dividend

The main schemes have been explained above and the following concepts will only briefly be differentiated from the other ones for the sake of completeness. Literature and studies about these schemes are not always precise and some might be overlapping or be duplicative. The following schemes are taken from the study “A Rough Guide to Individual Carbon Trading” by Roberts and Thumim from the Centre of Sustainable Energy and from the recent publication “Plan B? The prospects for personal carbon trading” by Bird and Lockwood.

The Ayres scheme, proposed by Ayres in 1997, is similar to the Cap and Share by Feasta. The whole economy is included, carbon rated will be fuel and electricity and the budget is allocated free only to the individuals. Companies and organisations must buy the permits from the national market. It differs in one main aspect: While under the Cap and Share scheme, individuals are done after selling their certificates, in the Ayres scheme they still need to surrender permits when buying fuel or electricity.⁶⁴

The next concept, Rate All Products and Services (RAPS), includes self-evidently all products and services in an economy. It is similar to the environmental certificates idea by Franz Groll which was described before. Again 100% of the permits are allocated free to individuals and they must surrender their permits for each and every product and service they are purchasing. This includes indirect emission, similar to the Franz Groll concept. Every company and business has to “rate” the products they

⁶⁴ Cf. loc. cit.: Bird; Lockwood: Plan B? The prospects for personal carbon trading. P. 51

produce according to direct and indirect emissions they create. This concept was assessed as unfeasible by the publication from Starkey and Anderson in 2005.⁶⁵

The last concept which is mentioned when talking about personal carbon trading is Cap and Dividend or Sky Trust. This programme is slightly different from all the other concepts. This idea is also including the whole economy, sets a budget and aims at all fossil fuels. In contrast to the other schemes, 100% of the budgets permits are auctioned to fossil fuel suppliers who need to surrender these permits. The revenues from the auction are paid into a trust which pays equal dividends to all individuals on a per-capita basis. The fossil fuel suppliers will then proceed to express their increased costs in higher prices which are supposed to lead to less consumption of fossil fuels and reduction of emission.⁶⁶

Concluding the chapter of the different personal carbon trading schemes it should be highlighted again that in the following analysis of the scheme, the TEQs scheme by David Fleming will be the basis since it is at the moment the most common concept.

5.6 Overlaps with EU ETS scheme

Since the implementation of the EU ETS scheme in 2005, already half of the British emissions are captured under a programme that limits them. Therefore when considering a personal carbon trading scheme it needs to be taken into account how these two schemes could possibly be combined or merged. Additionally there are a lot of other policies within the British economy that would be affected by the introduction of such a comprehensive programme.

On the table below are the basic differences between the two programmes displayed in a summary.

⁶⁵ Cf. Starkey, Richard; Anderson, Kevin: Domestic Tradable Quotas: A policy instrument for reducing greenhouse gas emissions from energy use. Manchester: Tyndall Centre for Climate Change Research 2005. p. 8

⁶⁶ Cf. loc. cit.: Starkey; Anderson: Domestic Tradable Quotas: A policy instrument for reducing greenhouse gas emissions from energy use. P. 8

	EU ETS	DTQs
Geographical scope	EU	National
Emissions categories	Energy and industrial processes	Energy
Gases covered	CO ₂	CO ₂ , CH ₄ , N ₂ O
% GHG emissions covered	30%	87%(UK)*
% CO₂ emissions covered	45%	97%(UK)*
% energy emissions covered	?	100%
Emissions rights surrendered by	High-emitting energy and industrial installations	All energy end-purchasers
Allocation of rights	Mainly grandfathered - increased auctioning over time	40% individuals - EPC 60% auctioned (UK)

*The emissions percentages for DTQs are calculated on the basis of the national emissions inventory which does not include emissions for international aviation or marine. Tyndall has produced emissions scenarios that include these emissions (Tyndall, Centre 2005).

Table 2: Comparison EU ETS and DTQs, Starkey, Richard; Anderson, Kevin: Domestic Tradable Quotas: A policy instrument for reducing greenhouse gas emissions from energy use. Tyndall Centre for Climate Change Research 2005. P. 36⁶⁷

The most obvious difference of the schemes is of course the economic scope. The EU ETS system covers only big industrial installations, while the DTQs/ TEQs scheme is covering economy-wide emissions, including residential emissions. While the DTQ's scheme is so far only thought to be implemented nationally, although it is of course possible to implement in more than one country, the EU ETS operate within the whole European Union region. When considering merging the two schemes it would probably be done via "expanding" the EU ETS scheme since half of emissions are already covered with it.

Both schemes could probably not operate simultaneously because this would lead to double-counting of emissions for the installations which would be covered under the EU ETS as well as the TEQs scheme. To exempt the installations in question from the TEQs scheme and only leave them covered by the ETS programme would not be feasible due to the large scale of the ETS admitted installations. The core point of a personal carbon trading scheme is to create an economy-wide concept that covers all or nearly all emissions under it. The TEQs are creating a cycle in which the whole economy needs to be included. Installations under the ETS could not be excluded when buying their energy because they would still be required to submit TEQs carbon allowances when trading with their energy. This would then create a market where two prices for carbon units would develop.

⁶⁷ The original table can be found in Annex.

The House of Commons concluded that for the consideration of implementing a TEQs scheme it would be necessary to find and define the policy landscape and make sure the scheme is compatible with other instruments like the EU ETS. Professor Ekins of the Policy Studies Institute on the other hand states that combining both schemes should be quite feasible and a possible overlap might even be encouraging. He argues that if both schemes were operating within the economy and would cover the same emissions then the tightening of one of the schemes overall caps would lead to decreasing prices of the other allowances and a loosening cap. If people would decrease their personal aviation because it was included under a personal carbon trading scheme then emission cuts would be achieved under the second cap as well.⁶⁸

It is therefore essential to investigate how the merge of the two schemes could be conducted and to ensure that if a TEQs scheme is implemented, the international requirements that are set for the ETS are still fulfilled and ensured. Further research will need to be conducted to create possible scenarios.

6 Efficiency

6.1 Carbon emissions saving potential

The greatest reason for implementing a personal carbon trading scheme is the theoretically large emission abatement that can be achieved. Because a personal carbon trading scheme places a cap on all national emissions, it ensures, theoretically, that this budget or limit will not be surpassed. This is a very persuasive concept since it enables a nation to reach all domestically or internationally agreed emission targets. The certainty about achievable emission reduction can only be created by a policy that operates with a cap. A tax-based scheme would be less certain because abatement can only be achieved via price signals. If the tax is set at a level that is not high enough for individuals to avoid the products then there will be no emission reduction.⁶⁹

Additionally a personal carbon trading scheme is actively integrating the population. It is not about externally imposed prices, but rather about the responsibility for each

⁶⁸ Cf. House of Commons; Environmental Audit Committee: Personal Carbon Trading: Fifth Report of Session 2007-08. London: The Stationary Office 2008. Ev 76, Q204.

⁶⁹ Cf. loc. cit.: Roberts; Thumim: A Rough Guide to Individual Carbon Trading. p. 16 cc.

individual to decide whether to gain from the scheme or not. Therefore it can be presumed that individuals will actively search for creative solutions to cut their carbon emissions. The scheme creates a personal interest for everybody to think about emission reduction. A tax would again not be able to do that.

It is also possible that after a successful implementation of the scheme, additional greenhouse gases are included under the cap. This should be relatively easy since all technologies, accounts and the database are already in place. Imaginable could also be the extension of the scheme towards indirect emissions as well. Although Starkey and Anderson have assessed this as not feasible, it might become more practicable once a personal carbon trading scheme is implemented. On the other hand it might not even be necessary anymore. If the economy is able to transform itself into a low-carbon economy with the help of the scheme, then indirect emissions will automatically be factored in by the parties concerned at some point.

6.2 Increasing public awareness

Another convincing argument for the implementation of a personal carbon trading scheme is the anticipated increase in public awareness. As aforementioned, people are actively integrated in the scheme and can, in contrast to a tax, decide for themselves whether they are gaining from introduction of the scheme or losing from it. Further on the whole population is integrated in the scheme and individuals will not feel as if the savings they have achieved by changing their lifestyle will be offset by the unchanged behaviour of their neighbours. If their neighbours are not changing anything in their emission-intensive lifestyle, then people can be sure that they are paying for that luxury. This effect will hopefully be also met by the willingness of individuals to calculate on a long-term basis. They will have the freedom to research on the topic and decide whether they want to decrease their emissions with the insulation of their home, the installation of a roof photovoltaic system or the sale of their car.

But it also needs to be taken into account that while public awareness will increase once the scheme is running, the public needs to be prepared and educated beforehand. While by now most people should be familiar with the implications of climate change and the need for action, there will always be some who are ignorant or uninterested to the issue which could be caused by a lack of access to information

or no interest in society issues. These people would need to be reached and informed to be able to take part in the scheme. Additionally the government will need to provide for programmes that explain the scheme and show people how to act within it and what is expected of them. For people that are not interested in reducing their emissions out of environmental motives, the perception that carbon is money will have to be created. Even if they will not be considerate in handling their emissions, they will think about it more when they realise that from saving carbon, money flows back to them. Still it will be an unusual concept for most people since the concept of money does normally include its infinite availability. But carbon allowances will not be infinitely available; even further, they will decrease annually leaving less for each individual to spend.

David Fleming is referring to the 'common purpose' when describing the impact of a personal carbon trading scheme on the public awareness. Everybody will have a stake in the system and by creating these stakes a common purpose for the whole population ensues. People will not only think about their own emissions but will also have an interest in the reduction of emissions of others. They should be able to deduct that if some people are emitting above average, they are contributing to a higher carbon allowance price which results in higher prices for the whole economy since companies will also need to pay that higher price. If the population is aware of this cause and effect relationship of high emissions of others then it can be anticipated that they will want to cooperate with others to serve the economy-wide purpose of low prices and subsequently low emissions. Still this concept and its implementation will be something entirely new to a population that has only so far experienced a system of individual consumer choices.⁷⁰

Various studies agree that while public awareness will increase with the implementation of a personal carbon trading scheme, the issue of public acceptance is another one.

⁷⁰ Cf. loc. cit.: Fleming: Energy and the common purpose: Descending the Energy Staircase with Tradable Energy Quotas. p. 13 cc.

6.3 Green taxation as a substitute scheme

Since green taxation or a carbon tax is considered the other viable policy instrument that may be implemented instead of a personal carbon trading scheme, the following chapter will briefly evaluate its impacts in terms of equity, effectiveness and efficiency.

A tax has one main disadvantage compared to a personal carbon trading scheme. While a personal carbon trading scheme places a cap on nationwide emissions and therefore guarantees the set carbon reductions, a tax can only achieve emission abatement via price signals. While a low tax will not result in significant abatement, a high tax will not be implemented due to political unacceptability. Also it is hard to calculate the effect a tax will have, and then, if the tax is set too low or too high, it can not be changed constantly since government and companies are pouring money into administrative issues.⁷¹

A carbon tax would have, similar to a personal carbon trading scheme, some impact on the income distribution of the population. It is less fiscally progressive than the scheme but is also putting a disadvantage on lower income households. Dresner and Ekins found that even if the revenues generated from the carbon tax would be used to offset low-income households with increased benefits and other targeted payments, the households in the lowest income deciles that would still be worse off account for 30%. This is a higher amount than the disadvantaged households which would result in case of a personal carbon trading scheme that are 19%, this will be explored in the chapter about income redistribution.⁷²

Furthermore if the tax rate is set at a relatively high level to ensure actual emission abatement, then it will be insurmountable for the low-income households. Households will also have no money to start making changes in their emission lifestyles. While a personal carbon trading scheme will at first allow the average household to continue with their usual emissions, which would make it easier for households to maybe invest in a green car or home insulation, a carbon tax will have an effect on every individual's income from its introduction. This will leave the households with effectively less money and in the worst case with no motivation to invest in technologies that would actually reduce their carbon emissions. A tax will

⁷¹ Cf. Fleming, David: Energy and the common purpose: Descending the Energy Staircase with Tradable Energy Quotas. London: The Lean Economy Connection 2007. p. 34 cc.

⁷² Cf. Dresner, S.; Ekins, P.: The distributional impacts of economic instruments to limit greenhouse gas emissions from transport. London: The Policy Studies Institute 2004.

also not trigger the kind of positive creative behaviour which is anticipated to result from the growing awareness and incentive of participation within a personal carbon trading scheme.

On the other hand a tax requires considerably less administrative effort and costs. The population will not have to be educated since the tax is only a monetary imposition. Companies are also familiar with a tax system and will if necessary and profitable for them reduce their emissions, although not out of the need to reduce emissions but rather because of a higher margin. There is also no need for the transformation of payment systems, setting up carbon accounts and the implementation of a new policy institute to monitor and operate the system.

Important to note is also that an effective tax would need to increase annually to guarantee declining emissions on a long-term basis. But such an escalator tax as would be needed was already tried in the UK with the fuel escalator tax and was abandoned after severe public protest. Hence the acceptability would need to be established in the same way as the acceptability of a personal carbon trading scheme.

Similar to a tax is the other viable policy instrument of upstream trading. Upstream trading is aiming at holding the “source” of emissions responsible. It would require only industrial installation to acquire carbon allowances which filter down to consumer level via price. Upstream trading limits fuel and energy suppliers and does not take the caused emissions of final products into consideration. The EU ETS is an upstream trading instrument.

7 Equity and Effectiveness

7.1 Public acceptance of the scheme

Since the main focus of the scheme is to involve private households under the cap, it is imperative to gain public acceptance from the majority of the population. It is difficult to run a test model of the scheme, due to the necessary involvement of the whole economy including organisations and government, the public needs to be educated differently. Within the course of DEFRA’s pre-feasibility study, there has also been conducted some research on public acceptance by Enviro and Opinion Leader. They have initiated a project in which they investigated the public’s take on a

concept like personal carbon trading with the help of several focus groups. They found that the general understanding of climate change and its implications for the participants' daily life varied considerably. While most people can identify the actions which are causing climate change, the knowledge about the individual impact of these actions is not very profound. When presenting individuals with the personal carbon trading scheme it can be noted that the majority of people had never heard of it and most reaction are negative. Reactions to the scheme are shifting towards a more positive attitude if individuals gain a better understanding. Concerns include the equity of the scheme regarding the rural population, families and vulnerable groups, moral issues about the gain-loss nature of the scheme and real life operation. Still most people identified it as a fairer concept compared to a carbon tax or upstream trading.⁷³

The following table displays the reactions in the post-group questionnaires.

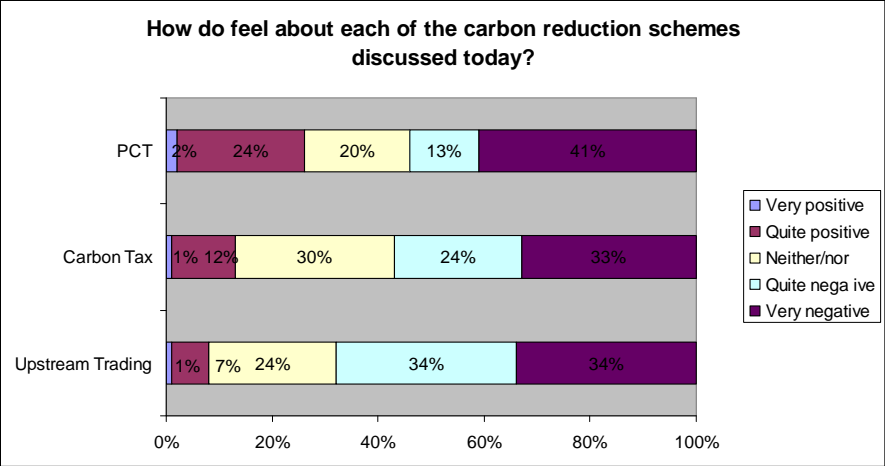


Figure 5: Questionnaire results policy options, Owen, L; Edgar, L; Prince, S; Doble, C: Personal Carbon Trading: Public Acceptability: A report to the Department for Environment, Food and Rural Affairs. London: DEFRA 2008. p. 46⁷⁴

The table displays the most polarising answers for personal carbon trading. While it has by far the most proponents with 26%, it also has the most 'very negative' opponents with 41%. It also has to be noted that the answers are based on an only short insight into the scheme and might change when people learn about it in more detail.⁷⁵ This is also backed in the response publication by the Lean Economy Connection which states that in their experience the attitude towards a personal

⁷³ Cf. Owen, L; Edgar, L; Prince, S; Doble, C: Personal Carbon Trading: Public Acceptability: A report to the Department for Environment, Food and Rural Affairs. London: DEFRA 2008. p. 46 cc.

⁷⁴ Original chart can be found in Annex.

⁷⁵ Insight into all three policy instruments has been given in two hour focus groups, which suggests that knowledge of all implications of personal carbon trading is not given in detail.

carbon trading scheme tend to become very positive with growing knowledge. Nonetheless it is a positive start for the concept to be preferred to the mainstream policy option of a tax and the already implemented option of upstream trading.⁷⁶

Public acceptance of the concept plays also a vital role for the political perspective on introducing such a scheme. No government will implement a policy which is neglected by the majority of the population if not absolutely necessary. Another poll regarding the acceptance was run in the recent study of the IPPR by Bird and Lockwood. They conducted some workshops and a nationwide survey to test attitudes towards the scheme. When participants were asked to choose between a personal carbon trading programme, a carbon tax and an upstream trading system, the majority answered with 'none of the above'. However, comparing the results for all of the schemes, the personal carbon trading scheme received the most votes with 27%. Both carbon tax and upstream trading only scored with 15%. The most popular arguments used by the poll participants in favour of a personal carbon trading scheme include the increasing awareness of the population of climate change and its implications, an anticipated changing behaviour regarding emissions, financial betterment of people with low emissions and assurance that everybody needed to participate within the scheme. The most popular arguments against the scheme were the feasibility of implementing such a large-scale programme, the complexity, corruption, public acceptability and the restriction of personal freedom. Another major fear of the public is apparently that the highest income deciles can 'buy their way out' of emission reduction. Although this argument is partly true because in fact people will be able to buy additional allowances at a market price, but only a limited amount, people do not seem aware that the money from buying additional units will flow back to people that are selling permits. The rich will pay the poor to emit more.⁷⁷

Overall it seems that while the current opinions on the introduction of the scheme are diverging wildly, it should be possible to win over the majority of the population for the scheme with educating them about it and comparing it to the other policy options which are considered. The most important part appears to be convincing the public that their emissions will need to decline in the future, no matter what policy instrument will eventually be used to achieve this.

⁷⁶ Cf. loc. cit.: Owen et al.: Personal Carbon Trading: Public Acceptability. p. 11 cc.

⁷⁷ Cf. loc. cit.: Bird; Lockwood: Plan B? The prospects for personal carbon trading. p. 33 cc.

7.2 Public income redistribution

7.2.1 Income redistribution

Accompanying the introduction of a personal carbon trading scheme would be some sort of public income redistribution. The redistribution is caused by the gain and loss that households will experience due to the monetary incentive of emission reduction. While some households will be able to reduce their emissions, or will already emit less than average, for some households it will be more effective to not change their emissions and buy additional allowances on the national market. This will particularly affect low-income and high-income households. Usually low-income households emit less carbon dioxide due to their lifestyles which can be caused in no car ownership, less electronic equipment and smaller houses or flats. On the other hand high-income households are likely to emit above average due to the reverse factors such as multiple cars, more electronic equipment and larger houses. It is likely that at the first introduction of the scheme the high-income households will not be inclined to reduce their emissions and will rather purchase additional units on the market. This behaviour will reverse if allowance prices are increasing considerably and the national cap is reduced. When this happens, only a small fraction of the very high-income households will still purchase additional permits because they are infinitely flexible towards market prices. Still there will be some high-income households who will profit from the scheme because they are emitting below average. This might be due to environmental concern and a subsequently green lifestyle. They may have an insulated home, drive automobiles with low consumption and purchase energy from renewable sources.

The majority of low-income households will gain from the scheme. They will emit less and can sell their surplus allowances on the market. This is anticipated to happen for about 80% of low-income households. The other 20% of low-income households are emitting above average and will lose from the scheme. This calculation was made in a study by Dresner and Ekins in 2004 and also found that the 20% of low-income households losing in the scheme would do so with only a small amount. A detailed table with the study results can be found in the Annex under Table 3.⁷⁸

Although the amount by which low-income households will lose from the scheme will be relatively small, behavioural changes might be harder to achieve than at high-

⁷⁸ Cf. loc. cit.: Dresner; Ekins: The distributional impacts of economic instruments to limit greenhouse gas emissions from transport.

income households. Low-income households usually do not have any funds which could be used to provide for insulation of their home or purchasing a more energy efficient car. Therefore emission reductions from these low-income households will need to be achieved solely by consuming less which would create an unfair situation compared to high-income households. Considerations about how low-income households might be supported in one-time investments towards their low-carbon lifestyles are in order.

This redistribution can also be split in a geographical impact. While low-income households living in urban areas may be able to substitute unnecessary car travels with public transport and have smaller flats, in rural areas this could be more difficult due to a lack of public transport and the need for operating a larger house or land.

Still the income redistribution can be assessed as a mainly positive component of the scheme since it will help the development of a more sustainable and interconnected society which is oriented on ecological targets by implementation of a fair concept.

7.2.2 Equity

With looking at the income redistribution feature also comes the question about the justice of the scheme, namely by allocating allowances on a per-capita basis. While the idea of an equal right to emit the same substances for everybody is fair and not disputable, it is still quite fiscally progressive and some exceptions will be necessary. First of all the issue of allowances for children is the most obvious one. The various schemes are proposing different procedures for child allowances. Some would not grant allowances for children but would rather entitle the parents to additional units; some would allocate half or even the full allowance to children. Regardless of which option the scheme would include, the age at which children, or by then adolescents, will enter the system as eligible individuals will need to be set. While the most obvious choice would be the age of 18 there are some factors to consider. What would happen to children that are moving out of their parents' house at age 16? And would children get granted a full allowances if still living at home at the age of 25? To reach a satisfying regulation regarding these topics more research is needed that specifically addresses these matters.

With all exception rules that might be considered it has to be taken into account the public and political acceptability. While a per-capita distribution of equal allowances is

fair in a philosophical sense, it will not be viewed as attractive from a governmental stand point. And while some adjustments and exceptions are necessary, the scheme needs to still be fair to people who will not receive any additional allowances due to their circumstances. If the scheme is contorted by too many exemption regulations then motivation of the population to genuinely work with the scheme and cut emissions might vanish.

A recent study from the Centre of Sustainable Energy investigated the possibilities of 'Moderating the distributional impacts of personal carbon trading'. This study examined how the losses of the 20% of low-income households, and in another scenario how the losses of all households, could be offset. They first assessed a number of variables that are connected with disadvantaged households, but only variables which point to structural and not lifestyle factors. Examples for these variables are the number of children in a household, the rurality and the central heating type. When alternating these variables with a specific regression equation, the following modified allocation numbers result.⁷⁹

Impact on the residual equal per adult allowance of the three allocation scenarios

Mean equal per adult allowance (kg CO₂):	
Equal per adult allocation	4,423
Modified allocation rules applied to 'low income' households only	4,321
Modified allocation rules applied to all households	3,837

Table 3: Mean equal per adult allowance, White, Vicki; Thumim, Joshua: Moderating the distributional impacts of personal carbon trading. Bristol: Centre of Sustainable Energy 2009. p. 11

The first scenario describes the allowances with no extra allowance distribution which leaves 4.4t CO₂ for every adult in the economy. The second scenario only changes the equal per-capita allowances slightly. They decrease to 4.3t CO₂ for the case of offsetting the monetary loss of low-income households with extra allowances. Households that would benefit from this scenario are the aforementioned 20%. And since they are only loosing by very little monetary amounts, the offsetting of this loss is only resulting in turning 2% of the whole allowance pot into extra allowances. The last figure displays the per-capita allowances in the case of offsetting all loosing households within the country. This would result in considerably lower allowances per

⁷⁹ Cf. White, Vicki; Thumim, Joshua: Moderating the distributional impacts of personal carbon trading. Bristol: Centre of Sustainable Energy 2009. p. 11 cc.

person at 3.8t CO₂. In this scenario 70% of households are affected and the needed offsetting allowances would account for 13% of the national pot.⁸⁰

After this evaluation of the possibilities for offsetting the losses of households under the scheme, it is clear that although implementing any additional regulations needs to be carefully considered, the introduction of supporting the low-income households which suffer from the scheme does seem like a practicable and feasible solution.

7.3 Technical feasibility and costs of the scheme

7.3.1 Technical feasibility

The feasibility and costs of the technical implementation of this scheme also require some investigation. While the technical implementation should not prove to be insurmountable, the costs of the setting up and running of the scheme are a different issue.

The first matter to tackle in case of an introduction of the scheme is the enrolment process of all eligible adults within the economy that would partake in the scheme. Connected with the enrolment of all adults is the allocation of the carbon allowances. Therefore the first question which remains is whether people within the economy would need to actively enrol themselves via contacting their respective agency or institution, or whether the enrolment process is initiated from the relevant institution. Once people are enrolled for the scheme and have taken ID verification, their carbon accounts will be set up in order to grant the prospective allowances. The registry or agency will not grant allowances to people which are not enrolled in the scheme which would result in people not being able to live independently in the country. One proposal includes adding the unclaimed allowances to the auctioning pot.

In accordance with figure 5 in the Annex there are three ways of involving customers in the process of paying with carbon credits. The first option are customers which are present at the point of purchase and therefore actively involved, then customers who are not present but are actively involved and customers who are not present and are not actively involved. This means that the customer could either be present at the point of purchase and pay with a multi functional carbon credit card, that the

⁸⁰ Cf. loc. cit.: White; Thumim: Moderating the distributional impacts of personal carbon trading. p. 11 cc.

customer is not physically present and pays over the telephone or internet with a multi functional carbon credit card or the customer is not taking care of the sale at all because he has his carbon credit account details deposited at his bank and pays by direct debit. The table also displays the named above pay-as-you-go option for individuals with no carbon account, which would mainly be tourists and temporary residents. All these transactions are already possible for customers with a regular bank account and would very probably not present any implementation problems if the carbon accounts are set up jointly with the respective bank accounts of the customers.⁸¹

Another factor to consider when assuming banks to set up the general running procedure of the scheme is their profit margin. While banks are offset for running monetary accounts with the ability to reinvest unused capital, this will not be possible with carbon accounts. A study of Accenture from 2008 has identified 4 ways of making it profitable for banks to run carbon accounts. One way of providing a profit margin would be the introduction of a spread on the price of traded carbon allowances. That way, the allowances which are allocated free of charge to the individuals will not be affected. Banks could also charge retailers for each carbon transaction that is made similar to the credit and direct debit procedures. Although the retailers will want to recover this money from their customers, so this scenario would affect the individuals in an unfavourable way. Other suggestions include an annual carbon account charge which would be paid by individuals as well or a subsidy or tax to offset the banks provided by the government.⁸²

7.3.2 Costs of the scheme

The technical costs of the introduction of a personal carbon trading scheme were investigated in 2008 by Accenture in a report to the DEFRA. Up until then, there had been no clear understanding about setting up and running costs of the scheme. Accenture estimated the costs based on their experience as a consulting agency and not by mathematical costing calculations. They have estimated the total implementation costs at being in between 700£ million and 2£ billion, the detailed

⁸¹ Cf. Lane, Chris; Harris, Bob; Roberts, Simon: An analysis of the technical feasibility and potential cost of a personal carbon trading scheme: A report to the Department for Environment, Food and Rural Affairs. London: Accenture 2008. p. 18 cc.

⁸² Cf. loc. cit.: Lane et al.: An analysis of the technical feasibility and potential cost of a personal carbon trading scheme. p. 23

table can be found in Annex under table 4. One of the main cost drivers but also subject to major cost uncertainties is the Data capture and ID verification process. Accenture has estimated this with a probable amount between 200£ million and 500£ million. The collection of data and verification of 50 million inhabitants eligible for the programme carries also a considerable time-consuming component. Depending on how this process will be enacted, via including citizens to actively enrol for the programme or the respective institutions carrying the responsibility of contacting the people, the variables of cost and time change.⁸³ Additionally some of the required information regarding the carbon accounts can not be collected in the current systems and will trigger some modifications of the databases and the customer relationship management.⁸⁴

The other main cost component of the estimated amount is the set up procedure of the carbon accounts and the issuance of the necessary carbon cards. This is assumed to be also in the region between 200£ million and 500£ million. To calculate these costs, Accenture has defined a 2£ cost per person of initially setting up a carbon account and a cost of 2£-3£ for the issuance of each new carbon card. The costs for this procedure might decline if it could be combined with reissuing expired credit or debit cards for a share of the population.⁸⁵

Other costs of the overall estimate include the information system changes which banks, building societies, fuel retailers and utilities will encounter: changes in billing and accounting and in payment procedures. Minor costs are assessed in establishing the auction infrastructure and in the compliance and enforcement part such as the registration of the licensed carbon retailers and the development of compliance systems.

Furthermore Accenture investigated the probable running costs of the scheme and concluded with the assumption of costs between 1£ billion and 2£ billion per annum. The detailed list can again be found in the Annex under table 5. The key cost driver of the running costs is the maintenance of the carbon credit accounts. Accenture situates the annual cost of running an additional current account at 40-50€ based on a European benchmark. But this figure is also very flexible, if the annual cost decline,

⁸³ While active enrolment of citizens would likely be less cost-intensive it is also very likely more time-consuming and vice versa in the case of initiation from the institutions.

⁸⁴ Cf. loc. cit.: Lane et al.: An analysis of the technical feasibility and potential cost of a personal carbon trading scheme. p. 30 cc.

⁸⁵ Cf. loc. cit.: Lane et al.: An analysis of the technical feasibility and potential cost of a personal carbon trading scheme. p. 31 cc.

then the overall maintenance costs will decline considerably as well. Additionally and mentioned before, Jenny Bird and Matthew Lockwood assessed the annual banking costs for a current account with no overdraft facility as being in the region between 14£ and 17.50£, which translates to 20-25€ annually, which is already only half the assessed cost of Accenture. When calculating the overall maintaining costs for the carbon accounts with this figure, then an amount of 500£ million to 1£ billion results. Following this publication by the DEFRA was a response from the Lean Economy Connection addressing misunderstandings. This response implies that while the cost calculation seems somewhat overstated, the revenues generated for the government by the scheme would, following Accenture's calculations, be in the region of an additional 6£ billion annually. This amount would on the one side cover all running costs of the scheme, and would on the other side also be able to amortize the implementation costs within a couple of years.⁸⁶

In this response publication, the Lean Economy Connection is also providing comments on other DEFRA reports regarding effectiveness, public acceptability and distributional impacts.⁸⁷

8 Qualitative results

8.1 Interview procedure

To gain additional thoughts and input on the possibilities of a personal carbon trading scheme, two expert interviews were conducted. When I started searching for experts who would be willing to provide their opinions on my dissertation, I started with looking for German expert who I could have maybe interviewed personally. After contacting several people at institutions dealing with climate change policy and related fields I had to acknowledge that the awareness of the scheme is very little in Germany and I started contacting British institutions. According to my German interviewee Dr. Michael Kopatz, a personal carbon trading scheme is not popular at all in Germany due to the nature of German politics. While a carbon trading scheme

⁸⁶ This income would be generated by the sale of allowances to organisations and other interested parties. Savings would also be possible because other policy instruments may become redundant.

⁸⁷ Cf. The Lean Economy Connection: DEFRA's pre-feasibility study into Personal Carbon Trading – A missed opportunity. London: The Lean Economy Connection 2008. p. 2 cc.

is viewed as more attractive in the United Kingdom, in Germany a tax is perceived as a better instrument.⁸⁸

Hence one of the two interviewees is a British expert on the subject, and another British expert provided some additional notes. The process of contacting the several institutions led in most cases to the reference towards the existing literature on the subject, but provided in some cases also additional insight into the nature of the scheme and its difficulties. Overall I have contacted about 15 to 20 people, which resulted in two useful interviews.

After establishing the contact with my two interviewees, I prepared an exposé of my dissertation with some sample questions. The exposé and sample questions were meant to facilitate an easier interaction with them. The sample document can be found in Annex.

The British expert is David Fleming, the originator of the DTQs/TEQs scheme and the founder of the Lean Economy Connection. He prepared his answers in written form which can also be found in the Annex. The German expert interviewed for this paper is Dr. Michael Kopatz, who is project leader of the research group on politics of energy, transport and climate at the Wuppertal institute for climate, environment and energy. He also received the exposé and sample questions but was additionally interviewed by phone. This interview can also be found in the Annex. His phone interview was transcribed afterwards and is subject to minor editorial changes caused in the different nature of a phone interview compared to written answers. Additionally his transcribed interview contains a few supporting annotations added in brackets and italics.

The other British expert, who provided some additional notes, is Richard Starkey, who was also already mentioned in this paper as working with Fleming's original DTQs scheme together with Kevin Anderson. He is currently working at the Tyndall Centre for Climate Change Research at the University of Manchester and his work on DTQs included a hearing at the House of Commons debate about a possible personal carbon trading scheme. Mr. Starkey also prepared some comments in written form, unfortunately, due to a lack of time, these are only some brief notes.

⁸⁸ Cf. Kopatz, Dr. Michael, Phone interview 22.07.2010 p. 14 cc. , Annex

8.2 Interview analysis

The formulated questions asked can be seen in the sample exposé and interview parts in the Annex. Overall the questions were designed as open questions to attain broad answers, which in the case of the phone interview, led to additional questions asked. The experts were asked the same or similar questions to secure comparability of the answers. Some additional, Germany-UK specific, questions were added in the interview with Michael Kopatz, also due to the fact that although he is familiar with the concept, he did not follow the recent political developments of the scheme as closely as the British experts.

Analysing the interview of Michael Kopatz, it can be established that he, and according to him the majority of the Wuppertal Institute, is not especially in favour of a personal carbon trading scheme. As a project leader for a German institute, he believes the best way to combat emissions and global warming is working with the existing policy instruments, such as the German eco-tax (Öko Steuer). Still he acknowledges that the different political approach and focus of the UK's economy, might promote the further pursue of a personal carbon trading scheme. Furthermore Dr. Kopatz states that he believes in a stricter approach to public order law, like finally introducing a speed limit in Germany, some problems can be solved very easily. The German eco-design directive (Ökodesign Richtlinie) is also one regulative law he favours for having a great effect. He also sees potential in regulating the automobile sector with, for example, weight restrictions on new cars. Absolute barriers and guarding rails is the term he uses. One main concern he brings forward regarding a personal carbon trading scheme is the political decision making process which will probably stretch over several years, and might in that time prevent progress on other necessary environmental policy proposals. Additionally no politician or political party seems brave enough to demand and represent such a progressive scheme.⁸⁹

The written answers from David Fleming to my questions are also very comprehensive and can be viewed in the Annex. He answered some additional questions after the interview with Dr. Kopatz took place, to provide some further insight into gathered arguments. Since he is the inventor of the TEQs scheme, his overall approach is of course very positive. The first interesting thing he shared is that

⁸⁹ Cf. Kopatz, Dr. Michael, Phone interview 22.07.2010 p. 14 cc. , Annex

the comprehensive feasibility studies by the DEFRA can not be taken very seriously due to the fact that each study uses another scheme as a basis. Apparently there has been no beforehand consensus on which scheme exactly to investigate. Additionally DEFRA claims to work with Fleming's TEQs scheme but they have never contacted him or appear to have read his publication about the scheme. He lists the criteria necessary for a successful scheme which were not taken into account by the DEFRA. These criteria include the guarantee that the carbon budget will be implemented, a specific time horizon to have time to plan ahead, equity of the scheme, assured rations, a common purpose and others. These criteria can also be found in his publication "Energy and the common purpose: Descending the energy staircase with Domestic Tradable Quotas". He also emphasises the existing need for the implementation of the scheme, also after the financial crisis, especially in regard to the nearing energy shortage. This shortage will, according to him, be caused by two reasons:

1. Because of oil depletion (peak oil) and/or shortages of other energy forms (such as gas or nuclear-generated electricity)
2. Because of reductions in the availability of fossil fuels as a result of a successful programme to reduce carbon emissions.

Because of either oil depletion or climate change (or both together for that matter) there will be a need to implement some sort of rationing system to energy.⁹⁰ This could either be done with a paper rationing system or an electronic system. Since a paper rationing system can not take into account the different energy user demands it has to be an electronic system. He therefore has no doubt that the TEQs scheme will be implemented, the only question remaining as to when this will happen. It will be too late if either of the reasons is causing it, and should be implemented as soon as possible.⁹¹

He does not agree with the argument of the German professor Claudia Kemfert that such a scheme might be more easily implemented in a recession due to naturally

⁹⁰ Although the German author Franz Groll argues that peak oil will not be the end of capitalism since there are still vast coal resources which will be invested in after the oil depletes. The development after peak oil is hard to foresee today.

⁹¹ Cf. Fleming, David, Interview 22.07.2010 p. 23 cc., Annex

less emissions because of less production.⁹² The lower emissions are only marginal and the climate of a recession does not complement the introduction of the scheme. In accordance with his answer, the ideal conditions for implementing the scheme require money, confidence and the experience of stability which is best provided in an economic boom. He also believes that the scheme will not deliver any additional benefits to an economy. The ideal scheme focuses on only one aim and does not have additional benefits or sub-aims. He does believe that TEQs will have a vital function in supporting the economy in case of oil depletion and climate change where it would otherwise collapse.⁹³

8.3 Cognitions and Take-away

One main take-away from the interview with Dr. Kopatz is the apparent difference in the British and German approach to their market economies. While Germany has a stronger affinity to tax policies and public law regulations, this tax affinity is not automatically transferable to the UK.

Therefore the possibility of an early introduction of the scheme might be given in the UK, under the assumption that each nation will have to introduce some sort of energy rationing system in the future. Additionally one major disadvantage of public law regulations are their limited scope. They do not leave any space for the affected parties to think of better solutions and are therefore giving away potential. This disadvantage usually reverses itself into an advantage with market-oriented policies and measures.

Another interesting argument brought up by Dr. Kopatz is the danger of no action regarding other policy measures during the political decision making process on the scheme. This needs to be considered, but as David Fleming puts it: "I think we may be in a situation where our society is unable to agree to any solution which would be effective. Its effectiveness rules it out. We have no trouble in agreeing to ineffective schemes, and we do not believe that we should even be asked to consider any other kind of scheme".⁹⁴ If policy makers will think about the scheme, maybe realising peak oil is approaching, they should then understand that it is important to implement the scheme as soon as possible to avoid further delays and prevent more impact.

⁹² Cf. Kempfert, Claudia: Jetzt die Krise nutzen. Hamburg: Murmann Verlag 2009. p. 76 cc.

⁹³ Cf. Fleming, David, Interview 22.07.2010 p. 23 cc., Annex

⁹⁴ Cf. Fleming, David, Interview 22.07.2010 p. 23 cc., Annex

Furthermore the different opinions on the internationality of the scheme are interesting to note. While Mr. Kopatz states that a scheme as comprehensive and progressive as personal carbon trading will probably never be implemented in only one country, Mr. Fleming argues that this is the only way to implement it.

The main take-away from Richard Starkey's notes is to critically question both the DEFRA's and David Fleming's findings and calculations on personal carbon trading. Both, the DEFRA and David Fleming, occupy rather polarising positions in the discussion of personal carbon trading and the resulting findings need therefore be assessed carefully.⁹⁵

9 Personal Carbon Trading as a policy measure

9.1 Economic and ecologic need for action

Both the economic and the ecologic need for action have already been highlighted in the course of this paper but will be summarised shortly in this chapter.

The current economic system has experienced a major setback with the financial crisis. Values and practices are being rethought and the economic landscape is being increasingly regulated. The economic systems need to move towards a more sustainable future to prevent a repeat of the financial crisis. This also needs to happen against the backdrop of our aging societies, with shrinking population growth in most advanced countries, the current market economy patterns need to be adjusted because economic growth will not be able to happen due to growing population. The dependency on fossil fuels and especially on oil needs to be reduced to prevent severe energy shortages in the future. If no rationing system is in place when fossil fuels become scarce then the effects on each economy will be enormous. Especially the UK has experienced major impacts of the crisis; the public bodies are largely indebted and unemployment figures are a lot higher than before the crisis.

The ecologic need to act is also inevitable. Already some reports claim that the two degree target is out of reach. The only possibility for still reaching this target is if GHG emissions drop significantly over the next couple of years. This can be achieved best by further environmental policies.

⁹⁵ Cf. Starkey, Richard, Interview 28.07.2010 p. 32 cc., Annex

“Large-scale problems do not require large-scale solutions; they require small-scale solutions within a large-scale framework”⁹⁶ is what David Fleming believes to be the necessary path facing climate change. Emission abatement needs to be tackled by each country individually first, and can then be integrated into an international context.

9.2 Comparison of the economic scheme costs and gains

Apart from the monetary costs and gains of the scheme, that will be summarised shortly, the main economic gain of the scheme is the diminishing dependence on fossil fuel, especially oil, which will result. Because fossil fuels will need to be reduced, more investment in alternative energies and technologies will take place. An ideal eventual result of a personal carbon trading scheme would be to limit fossil fuels to an absolute minimum and supply the economy with energy from renewable sources. The monetary gain from an early shift to more renewable energies can not be assessed today, but will definitely be existent. Renewable energies will also be infinitely available to the economy and do not cause harmful emissions.

Investing in a personal carbon trading scheme will also not only decrease the dependency on the big oil exporting nations and oil itself, it will also create employment in new areas, as in private business and the administrative bodies of the scheme.

The German author Franz Groll argues furthermore, that if the “ecologisation of the economy”⁹⁷ falls into a period of higher unemployment and an excess capacity of skilled personnel then it will directly lead to an increase in national welfare caused by more investment and the effect of securing future welfare for the economy by reducing fossil fuel dependency.⁹⁸

The growing domestic investment might also lead to less money being invested abroad and incoming foreign direct investments (FDI). The UK has traditionally been a country of high incoming FDI, in 2005 it even was the country with the most inward FDI from OECD countries. FDI amounted to US\$ 165 billion in 2005, which was three times as high as the FDI received in 2004.⁹⁹ This development proves a certain

⁹⁶ Cf. Fleming, David, Interview 22.07.2010 p. 23 cc., Annex

⁹⁷ Cf. loc. cit.: Groll, Franz: Von der Finanzkrise zur solidarischen Gesellschaft. p. 30

⁹⁸ Cf. loc. cit.: Groll, Franz: Von der Finanzkrise zur solidarischen Gesellschaft. p. 30 cc.

⁹⁹ OECD: FDI into OECD countries jumps 27% in 2005. at: <http://www.oecd.org/> (03.08.2010)

confidence of investors in the British economy which suggests that there is a good possibility of high FDI in the future.

Apart from the implementation costs of the scheme, that are only a one-time investment, the running costs need are a major factor to consider compared to other possible instruments such as a tax. While a tax has virtually no implementation and running costs and only generates governmental income, a personal carbon trading scheme will require more monetary investment. As already assessed earlier, the potential running costs have been calculated to be in the region of 1 to 2£ billion annually by the DEFRA. But the calculation of government income under the same assumption leads to 6£ billion annually, which would result in at least 4£ billion revenues.¹⁰⁰

This would be no monetary imposition on the public body, on the contrary, with these calculations the implementation costs will be amortized after one or two years depending on other related governmental expenses such as educational programmes. Additionally, as aforementioned as well, the Lean Economy Connection does question these figures in terms of height. These figures can not be calculated for sure prior to implementation and running of the scheme, but with governmental income the scheme does justify itself. Still revenues of the scheme will decline with a declining carbon budget over time, but running costs may decrease also due to advanced technologies or other factors.

9.3 State of Debate

In 2007 and 2008 the British House of Commons discussed the scheme in session, initiated by the Environmental Audit Committee, with Ed Miliband as an important proponent. Ed Miliband was appointed Secretary of Energy and Climate Change in 2008 and he was the one who announced the newly set emission abatement target of 80% instead of 60% until 2008. The session report of the House of Commons is very comprehensive but comes to the close that in regard to personal carbon trading “the Government has decided to wind down its work in this area on the grounds of high implementation costs and public resistance to the concept”.¹⁰¹

¹⁰⁰ This figures are all hypothetical and while the DEFRA may somewhat overstate them; the Lean Economy Connection may also be subject to understating.

¹⁰¹ Cf. House of Commons; Environmental Audit Committee: Personal Carbon Trading: Fifth Report of Session 2007-08. London: The Stationary Office 2008. p. 39

This decision was mainly based on the pre-feasibility studies undertaken by DEFRA which assessed the implementation and running costs of the scheme as very high and the concept as ahead of its time. Nonetheless the session report of the House of Commons is one of the most comprehensive overviews of the proposed scheme and with several expert hearings an informative report of the work done so far.

The Environmental Audit Committee does not entirely agree with the Governments findings and states that “Personal carbon trading could be essential in helping to reduce our national carbon footprint. Further work is needed before personal carbon trading can be a viable policy option and this must be started urgently, and in earnest”.¹⁰²

Further conclusions of the Environmental Audit Committee include the recognition that personal carbon trading will very probably be able to achieve greater emission reductions than green taxation and the impossibility of meeting the 2050 emission abatement target when neglecting the domestic sector. The Committee also acknowledges the behavioural changes that the scheme will be able to induce and states that other existing policy instruments are not likely to achieve this.¹⁰³

A new British government has been elected in May 2010 and it remains to be seen whether they will continue investigating personal carbon trading or are more in favour of the existing initiatives and instruments to work towards achieving the 2050 reduction target.

¹⁰² Cf. loc. cit.: House of Commons; Environmental Audit Committee: Personal Carbon Trading: Fifth Report of Session 2007-08. p. 34

¹⁰³ Cf. loc. cit.: House of Commons; Environmental Audit Committee: Personal Carbon Trading: Fifth Report of Session 2007-08. p. 35 cc.

10 Future Prospects of the Personal Carbon Trading scheme

10.1 Conclusion

Concluding this paper on the opportunities of a personal carbon trading scheme, a short summary of the headline findings will follow.

The investigated equity of the scheme is given with the equal per-capita distribution of allowances for each individual. By providing the same rights to every individual in an economy, nobody should initially feel discriminated. Some mechanisms still need to be set, like support for people in the lowest income deciles, but this has been assessed as feasible.

Public opinions are also more favourable towards a personal carbon trading scheme than other energy rationing instruments.

Technical implementation of the scheme has been evaluated as feasible by various studies since it can go hand in hand with the existing direct debit and credit card systems. Enrolment of all eligible individuals is one part of the implementation process which will take up a lot of time and resources, especially since the UK has no current obligatory ID management system (in contrast to countries like Germany where the enrolment process might therefore be somewhat easier).

Public acceptance of the scheme will also largely depend on the understandability of the scheme. There need to be some support programmes in place to help develop an initial understanding of the scheme and learn how to live with it. People that do not want to manage their carbon accounts themselves should be able to let their bank act as an intermediary. But since the scheme is likely to provide large governmental revenues from the tender procedure, the resources for supporting activities will be given.

Furthermore, as summarised in the previous chapter, the costs of the scheme will initially be higher, but **will be offset through revenues and the redundancy of other environmental policies**.

Additionally the scheme will comprehensively **prepare the economy for the next decades of declining fossil fuel resources** by ensuring the movement towards renewable energies and fewer emissions and eventually a low-carbon economy.

The declining carbon cap of the scheme also **ensures the set emission reductions**. International and domestic emission abatement targets are reachable and will set a pioneering example of emission management.

The conclusion of the House of Commons to wind down the work on personal carbon trading based on its high implementation costs and public resistance can also be partly disproved. While implementation costs will initially be high, they will also be offset after a short time, and as for public resistance, the investigation of public opinions on the scheme have shown that if the public has to choose between the different emission reduction policy instrument, the majority chooses personal carbon trading.

It is even more important after the financial crisis to evaluate the possibilities of an early introduction of the scheme to avoid another worldwide crisis which will be caused by the scarce fossil fuels and climate change. The scheme may also present the economy with **stimulation towards a green industry, provide governmental revenues, create employment and secure national welfare on a long-term basis.**

Concluding this paper it is finally important to mention that there still remain questions as to how this scheme would affect international trade relations. This was not subject in this paper as investigation into this topic is at the moment not known. Related to the effect on international trade relations is the question how to prevent fraud in the system. Fraud could be committed at international company level, or at individual level. This was also not subject in this paper.

10.2 Outlook

This paper evaluates a personal carbon trading as a favourable policy option, still it has to be admitted the outlook of an actual implementation of the scheme does not seem to be given in the UK or any other European country at the moment. The UK has acknowledged its emission abatement goals with adopting the Climate Change Act and has, in contrary to other countries, already conducted several studies on the subject of personal carbon trading. The scheme has been put forward by the Environmental Audit Committee, but has been assessed as ahead of its time by the House of Commons for now. The financial market crisis has temporarily shifted the focus of policy makers and governments away from global warming issues and the Copenhagen conference could not decide on further climate treaties. The newly elected British government, a coalition of the conservative party and liberal

democrats, has already emphasised its main target to be economic recovery and deficit reduction. Environmental policy aims are not visible yet.

Sill with an escalator tax having failed before in the UK, the possibility for implementing a personal carbon trading scheme looks more promising than in other countries. The climate conference in Cancun this year will hopefully prove successful in deciding upon follow up targets for the Kyoto protocol and shift focus of governments back to global warming and emission abatement issues.

Emissions of domestic households will eventually need to be subject to reduction measures in all countries, not only the UK, and the only question remaining is the one which policy instrument will be chosen to do so. Advantages and disadvantages of a tax have been discussed in this paper, and after evaluating, then a scheme involving a national cap and emission trading proves, theoretically, to be the more effective and efficient instrument.

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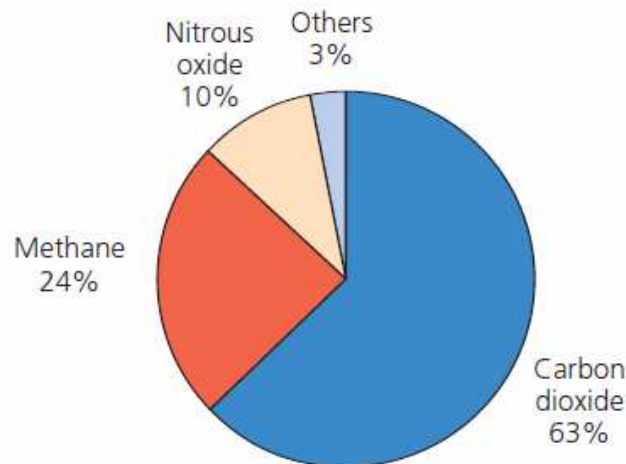
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The relative contribution to global warming over the next 100 years of current emissions of greenhouse gases.



Source: HM Government: Climate Change: The UK Programme 2006. Norwich 2006. P. 9

Figure 2: Cumulative CO₂ emissions from fossil-fuel combustion, 1990-2010

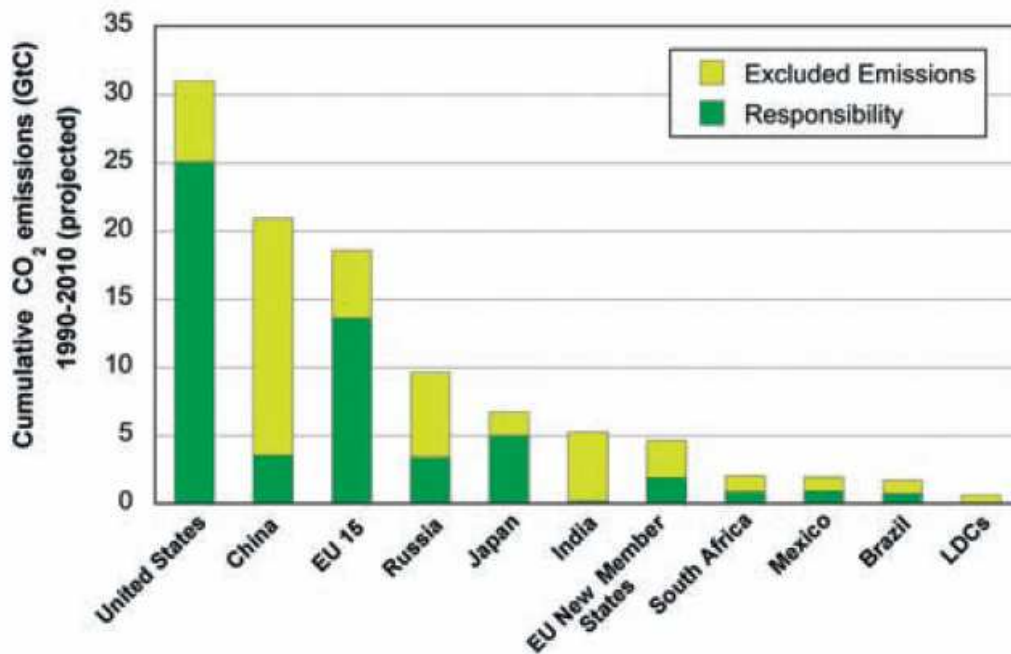
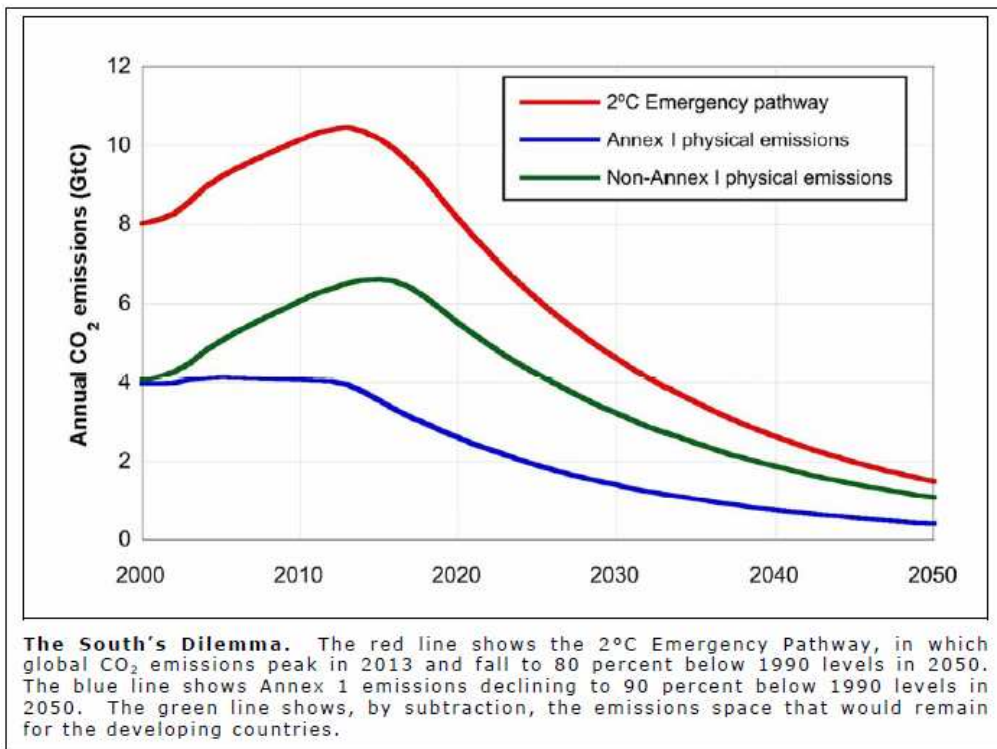


Figure 5. Cumulative CO₂ emissions from fossil-fuel combustion, 1990–2010. Each bar is divided between a green section that shows “responsibility” and a yellow section that corresponds to emissions associated with consumption below the development threshold.

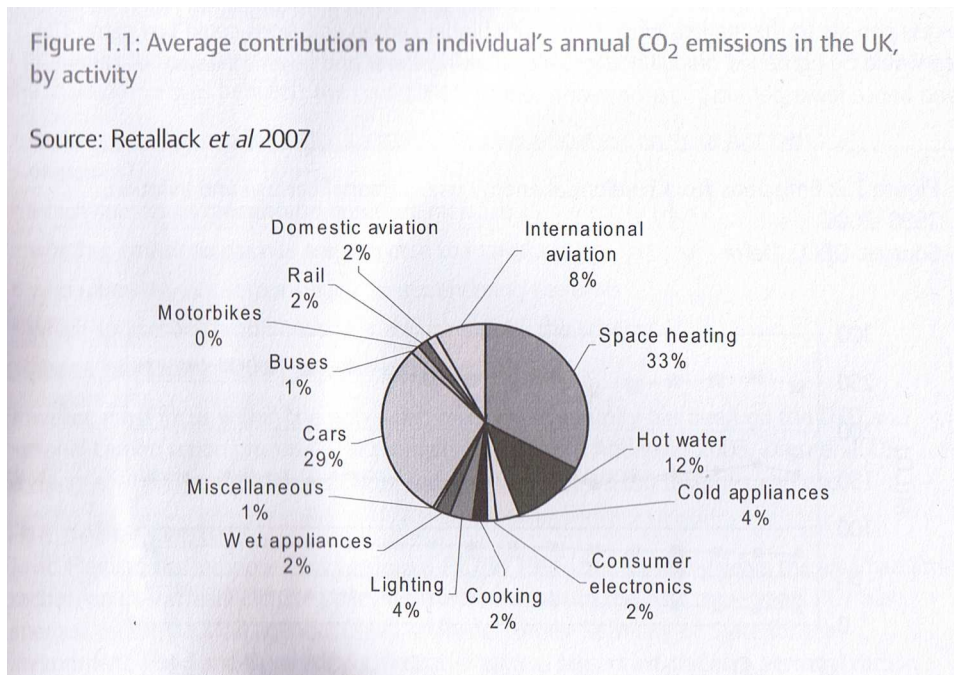
Source: Baer, Paul; Athanasiou; Kartha, Sivan: The right to development in a climate constrained world. The Greenhouse Development Rights Framework 2008. p. 53 cc

Figure 3: The South's Dilemma



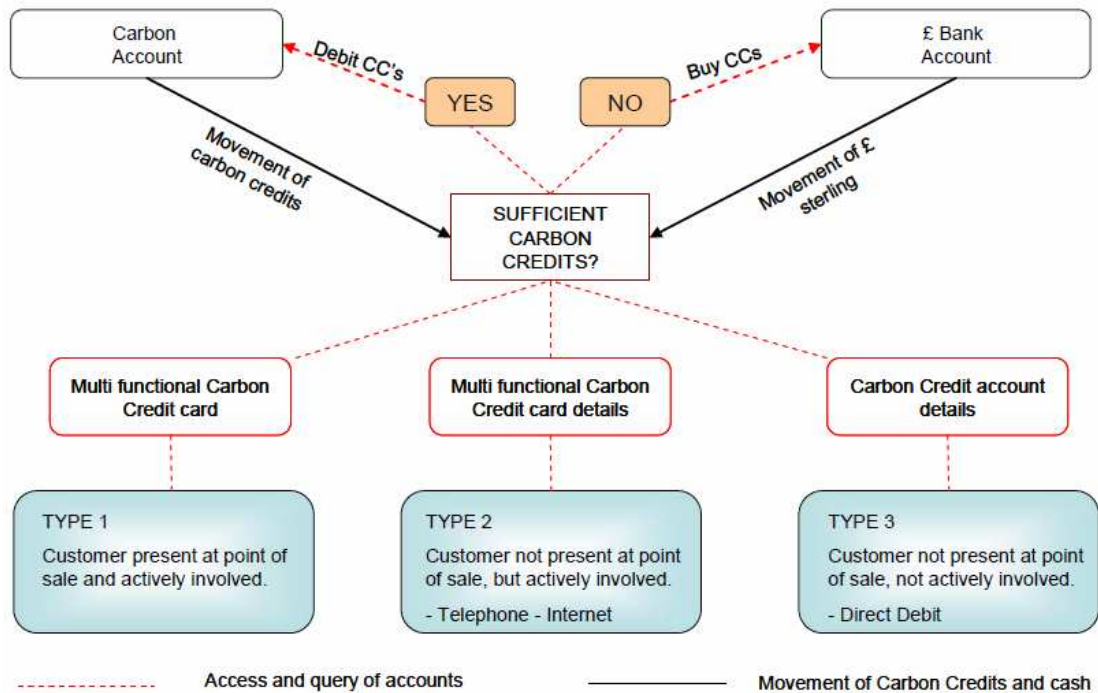
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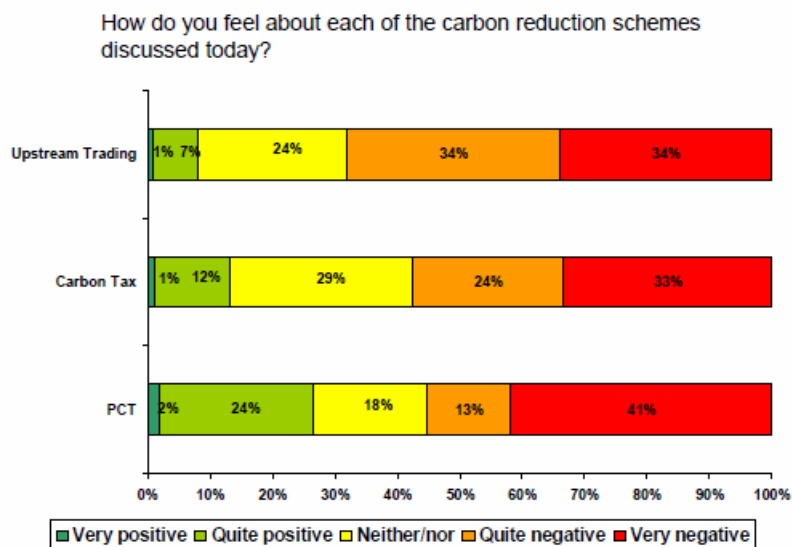
Source: Bird, Jenny; Lockwood, Matthew: Plan B? The prospects for personal carbon trading. London: IPPR 2009, p. 11

Figure 5: Technical requirements for a carbon credit card



Source: Lane, Chris; Harris, Bob; Roberts, Simon: An analysis of the technical feasibility and potential cost of a personal carbon trading scheme.: A report to the Department for Environment, Food and Rural Affairs. London: Accentrue 2008. p. 18

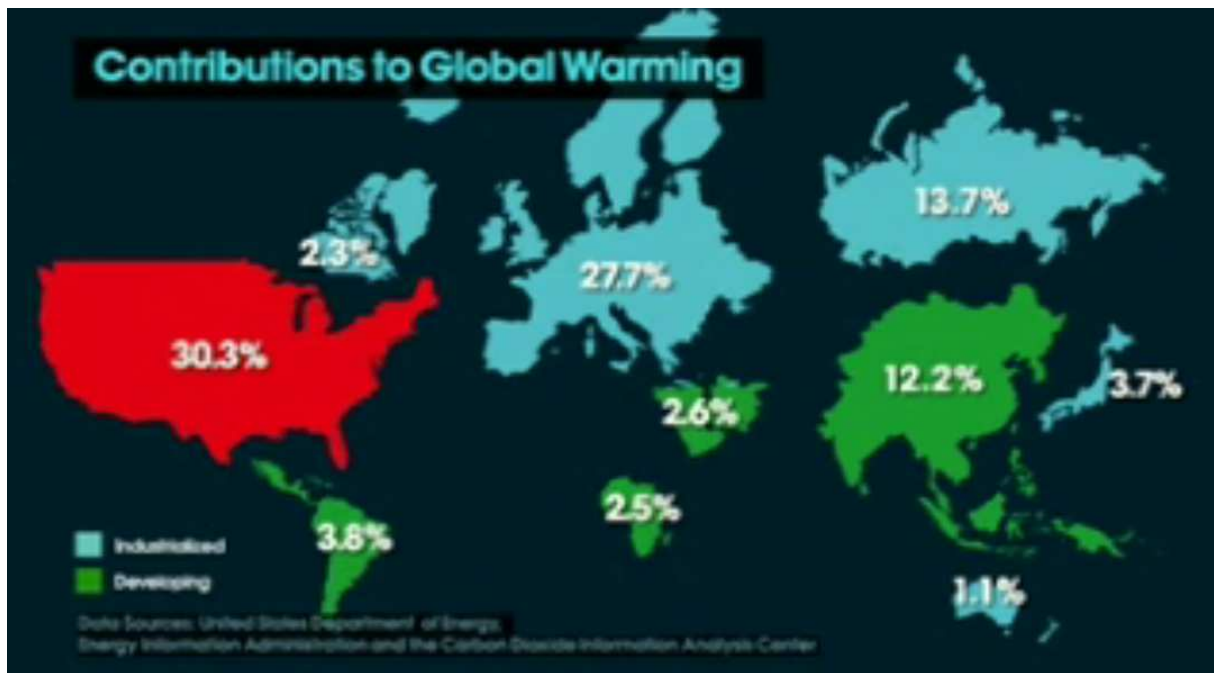
Figure 6: Questionnaire results policy options



Base: 92 participants

Source: Owen, L; Edgar, L; Prince, S; Doble, C: Personal Carbon Trading: Public Acceptability: A report to the Department for Environment, Food and Rural Affairs. London: DEFRA 2008. p. 46

Figure 7: Contributions to Global Warming



Source: An Inconvenient Truth. Guggenheim, Davis; Gore, Al. 2006.

List of tables

Table 1: Translating Emissions into Fuels

Translating Emissions into Fuels⁵	
Estimates of the global warming potential (GWP) of gases released by the production and combustion of fuels. 1 kg carbon dioxide = 1 carbon unit. The GWP of methane and nitrous oxide is measured as carbon dioxide equivalents.	
Fuel	Carbon units
Natural gas	0.2 per kWh
Petrol	2.3 per litre
Diesel	2.4 per litre
Coal	2.9 per kg
Grid electricity (night)	0.6 per kWh
Grid electricity (day)	0.7 per kWh

Source: Fleming, David: Energy and the common purpose: Descending the Energy Staircase with Tradable Energy Quotas. London: The Lean Economy Connection 2007. p. 10

Table 2: EU ETS and DTQs compared

	EU ETS	DTQs
Geographical scope	EU	National
Emissions categories	Energy and industrial processes	Energy
Gases covered	CO ₂	CO ₂ , CH ₄ , N ₂ O
% GHG emissions covered	30%	87% (UK) ¹
% CO₂ emissions covered	45%	97% (UK) ¹
% energy emissions covered	?	100%
Emissions rights surrendered by	High-emitting energy and industrial installations	All energy end-purchasers
Allocation of rights	Mainly grandfathered – increased auctioning over time	40% individuals – EPC 60% auctioned (UK)

1. The emissions percentages for DTQs are calculated on the basis of the national emissions inventory which does not include emissions for international aviation or marine. Tyndall has produced emissions scenarios that include these emissions (Tyndall, Centre 2005).

Source: Starkey, Richard; Anderson, Kevin: Domestic Tradable Quotas: A policy instrument for reducing greenhouse gas emissions from energy use. Tyndall Centre for Climate Change Research 2005. P. 36

Table 3: Effect of DTQs including aviation with a quota for each adult and half a quota for each child

Table 12: Effect of DTQs including aviation with a quota for each adult and half a quota for each child				
Deciles	average net change £/year	per cent losers	per cent gainers	per cent losing > £1pw
1	36.31	18	82	3
2	23.55	27	73	2
3	23.10	27	73	4
4	14.48	34	66	7
5	7.32	43	57	8
6	-3.58	47	53	10
7	-7.32	54	46	13
8	-20.23	68	32	21
9	-29.60	75	25	27
10	-42.95	78	22	31
All	0.00	48	52	13
Households with children	+11.14	41	59	13
Households with pensioners	+12.33	32	68	2

Source: Roberts, Simon; Thumim, Joshua: A Rough Guide to Individual Carbon Trading. Department for Environment, Food and Rural Affairs 2006. p. 30

Table 4: Estimated costs of main components and tasks involved in setting up a Personal Carbon Trading scheme

Elements of Personal Carbon Trading scheme	Cost	UTS
Design and implementation		
Design of complete business and technical architecture, including compliance	£50m - £100m	Less than £10m
Overall programme management of implementation	£50m - £100m	Less than £10m
Enrolment, ID verification and allocation		
Marketing and publicity of Personal Carbon Trading scheme	£50m - £100m	
IT changes: customer database, customer interface and payment systems	£50m - £100m	
Data capture and ID verification	£200m - £500m	Less than £10m
Accounting and transactions		
Banks & Building Societies IS changes	£20m - £100m	
Banks & Building Societies set-up of accounts and issue of Smartcards	£200m - £500m	
Fuel retailers Information System changes for payments and accounting	£20m - £100m	
Fuel retailers Point of Sale equipment – tills and card readers	£10m - £100m	
Utilities IS changes for billing and accounting	Less than £10m	
Utilities data capture of CC account details (for direct debits)	£10m - £100m	
Changes to payment processing schemes – e.g. Visa, Mastercard, VOCA	Less than £10m	
Auction and trading		
Establish auction infrastructure	Less than £10m	Less than £10m
Register new CC commodity on exchange(s)	Less than £10m	Less than £10m
Market participants registration on exchange(s) and necessary internal changes	£10m - £100m	Less than £10m
Compliance and enforcement		
Registration of licensed carbon retailers	Less than £10m	
Development of compliance systems and enforcement mechanisms	Less than £10m	Less than £10m
Development of CC surrender database	Less than £10m	Less than £10m

Source: Lane, Chris; Harris, Bob; Roberts, Simon: An analysis of the technical feasibility and potential cost of a personal carbon trading scheme: A report to the Department for Environment, Food and Rural Affairs. London: Accenture 2008. p. 30 cc

Table 5: Estimated costs of main elements and tasks involved in operating a Personal Carbon Trading scheme

Elements of Personal Carbon Trading scheme	Cost pa	UTS
Overall management		
Policy oversight and administration of scheme	Less than £10m	Less than £10m pa
Enrolment, ID verification and allocation		
Operation and maintenance of IT systems	£40m - £100m	
Periodic allocations	£20m - £100m	
Management of leavers, joiners and changes of circumstances	£40m - £100m	
Accounting and transactions		
Maintenance of CC bank accounts	£750m - £1bn	
Vehicle fuel purchases	£50m - £100m	
Utility billing transactions	£20 - £50m	
Inter-personal transfers of CC	£10m - £100m	
Purchase or sale of CC	£10m - £100m	
Auction and trading		
Quarterly auctions	Less than £10m pa	Less than £10m pa
Wholesale trading transactions	Less than £10m pa	Less than £10m pa
Compliance and enforcement		
Operation of CC surrender process	Less than £10m pa	Less than £10m pa
Compliance monitoring and audit	£10m - £100m	Less than £10m pa

Source: Lane, Chris; Harris, Bob; Roberts, Simon: An analysis of the technical feasibility and potential cost of a personal carbon trading scheme: A report to the Department for Environment, Food and Rural Affairs. London: Accenture 2008. p. 33

Interview and Questionnaires

Sample Questionnaire:

Personal Carbon Trading in the UK:

Considering opportunities in times of climate change and the financial market crisis

Exposé

In the 21st century climate change has become an omnipresent and most important matter to all nations of the world. The industrialised western countries have been living beyond their means regarding greenhouse gas emissions and non-renewable resources for the last decades. Calculations like the ecological debt day illustrate the need for change in attitudes and behaviours towards our environment. First steps are being taken with projects as the EU Emissions Trading Scheme (EU ETS) which already caps emissions for all big installations within the European Union since 2005. It also becomes clear that we not only need to invest in restructuring our societies to prevent further climate change, but that compensation for climate change impacts so far will additionally get very expensive.

The other compounding affair of the last years was and is the financial market crisis affecting nations around the world at different levels. In many countries this crisis has unveiled structural problems and forced their governments to raise credits for astronomical amounts. Therein also lays the challenge for the affected nations. They have to combine restoring their economies and implementing climate change goals, mainly the reduction of CO₂ emissions, in the near future. To achieve these objectives, concepts such as the ecological finance reform in Germany are founded and implemented. The United Kingdom is also pioneer in many ecological concepts and has in the recent past been working on the concept of Personal Carbon Trading. Personal Carbon Trading is a scheme developed and analysed over the past years in the UK. It aims at reducing greenhouse gas emissions from households via assigning a set allowance of CO₂ emissions to each individual on a per-capita basis for free. The rest of the allowances are auctioned to businesses and public bodies. These allowances can then be used provide for energy, fuel and transportation. Each activity will deduct from the individual's or institutions/company's carbon account to match the consumption of emission intensive goods. Credits which are not needed by the individual can be auctioned off or, if the individual is exceeding their carbon limit, can be bought. This way the overall set carbon allowance for the whole population will not be surpassed.

In contrast to the EU ETS scheme, individuals are actively included in the emission reduction targets. If emission trading is only done on industry level, the effect for individuals is only in increased prices. They have no motivation of decreasing their own emissions, they will just try to substitute the higher priced products.

Development and feasibility studies regarding the Personal Carbon Trading scheme are ongoing and the matter was already discussed in the House of Commons in 2007/08. But nonetheless opinions of the involved institutions regarding the scheme and its variations are diverging. Objections are put forward because of anticipated implementation and running costs, public acceptability and justness, and effectiveness. Due to the relatively progressive nature of the scheme, some consider it ahead of its time and are more in favour of the traditional and proven method of taxation.

But still this scheme is considered vital by some proponents for the ulterior aim of cutting emissions by up to 80% against the 1990 baseline since households account for more than 40% of all UK emissions.

There are different approaches which are considered when thinking of implementing such a system. Three of the most common schemes are PCA's, personal carbon allowances, TEQs, tradable energy quotas, and Cap and Share. All of these schemes are similar at the core concept but vary regarding scope, allocation and technology. Additionally green taxation is by some opponents considered to be the less intrusive and reliable option.

In the aftermath of the financial market crisis a lot of money is being borrowed and invested by the public bodies to revive the economy and save important financial institutions. And while it is important to do so, it is even more important to invest in substantial climate protection industries and policies. By doing this, the government can pursue the two aims of climate protection and economic recovery at the same time. Climate protection can also be a growth opportunity if the right measures are taken. By implementing a Personal Carbon Trading scheme, companies would have to start thinking about reducing their emissions to stay competitive. They might invest in renewable energies, search for more sustainable suppliers and develop low-emission technologies and products. This might also lead to the creation of new and more jobs. Additionally the scheme would also provide the government with revenues from the auctioning of the permits to companies and other interested parties, which could be used to consolidate the indebted public bodies. A Personal Carbon Trading scheme could be very useful and valuable as a policy instrument, because on the one side it levels the way towards significant emission abatement, but also on the other side as a fiscal means to help recover from the financial crisis by creating a fairer and sustainable economy. A comprehensive study by the Department for Environment, Food and Rural Affairs assesses the implementation and running costs as very high compared to other options such as the introduction of a tax. But since Personal Carbon Trading is a pioneer

concept these are only estimates and the Lean Economy Connection has put forward objections regarding the height of the assessed figures. Although initially the implementation costs will be very high, compared to other measures, but running costs are likely to be lower and might even decline over time due to the development of more effective technologies. The implementation of a Personal Carbon Trading scheme would have an impact also on the social justness of the respective society. Because low-income households usually emit less carbon, they would be profiting from selling their allocated surplus permits. High-income households that emit more than their allocated permits would need to pay for their extra emissions. Therefore the scheme promotes social justness and is also providing incentives for individuals and companies to reduce emissions on their own accord.

Questions

- How would you assess the evaluation of the DEFRA (Department for Environment, Food and Rural Affairs) and subsequently the House of Commons from 2008 that a Personal Carbon Trading scheme is “ahead of its time”?
- Would you think the implementation of a Personal Carbon Trading scheme is still in the realm of possibilities after the financial market crisis?
- Some voices claim that the financial market crisis would have had less impact if our economies were already located in a process towards more ecologic (and subsequently economic?) sustainability. Do you agree with this and where would you see interconnections between economic and ecologic policy?
- A lot of individuals have also been affected by the financial crisis through devalued financial investments. Might the British population now be more willing to invest their money in tangible assets like a home solar photovoltaic system to provide their own clean energy?
- The German professor Claudia Kemfert argues that in the aftermath of the financial crisis overall carbon emissions are lower than in times of an economic boom and that therefore emission abatement targets are more feasible. Would it be easier to implement a Personal Carbon Trading concept in a recession in terms of adaptation?
- How would you assess the concept for international use? Would it be beneficial or obstructive to implement the scheme in all EU countries?

And lastly:

- Do you have a suggestion to whom I could/should talk as well?

Interview 1:

Telefoninterview mit Michael Kopatz, Projektleiter Forschungsgruppe Energie-, Verkehrs- und Klimapolitik am Wuppertal Institut für Klima, Umwelt und Energie.

22.07.2010

Warum ist PCT in Deutschland nicht so bekannt/ diskutiert wie in UK?

Die Briten haben einen anderen Fokus auf die Marktwirtschaft. Beispielsweise waren viele europäische Staaten, insbesondere Deutschland, für die Einführung einer CO₂ Steuer. Das ist in Großbritannien eher unpopulär, der CO₂ Handel war aus britischer Sicht wesentlich attraktiver. Dieser Handel mit persönlichen CO₂ Guthaben ist eigentlich vom Grundgedanken, von den kulturellen Grundlagen, eher attraktiver und sympathischer für ein Land wie Großbritannien im Gegensatz zu Deutschland. Das wäre meiner Meinung der Meta-Fokus dieses Vorgehens.

In Deutschland gibt es nach wie vor eine Reihe von Steuerdiskussionen und wenn man sich diese Emissionshandel Diskussion anhört, dann merkt man das das in Deutschland nicht als ideales Instrument angesehen wird. Das es jetzt schon einen Emissionshandel auf Industrieebene gibt, liegt daran das es sich auf europäischer Ebene durchsetzen ließ. Der upstream Ansatz wird ja eigentlich allgemein von den Experten als attraktiver angesehen und dann ist man ja quasi schon bei einer Steuer. Eine Steuer kann nur leider nicht abschätzen welche Erträge Sie erwirtschaften, ob die Leute sich anpassen. Das ist auch was Herr Weizäcker mit Faktor 5 (*Anmerkung: „Faktor fünf- Die Formel für nachhaltiges Wachstum“ von Ernst Ulrich von Weizäcker beinhaltet die These, dass sich die Ressourcenproduktivität um bis zu 80% weltweit steigern lässt*) im Moment propagiert. Er war immer für eine Steuer aber dann haben wir die Ökosteuer bekommen und jetzt sagt er wir brauchen eine Ökosteuer die ständig ansteigen muss. Das gab es ja in Großbritannien auch schon mit dem fuel escalator. Das hatte in Großbritannien einen enormen Effekt auf die Nachfrage von Benzin und Treibstoff. Und das sehe ich jetzt als das Konzept was dem persönlichen CO₂ Handel gegenübersteht, eben weil es auch einen eindeutigen Effekt hat. Letztendlich kann man auch eine Steuer auf Pestizide festlegen.

Es klingt spontan erstmal sehr attraktiv, grundsätzlich kann man einen großen Vorteil festhalten, wessen auch insofern an Popularität gewinnen könnte, die Bewusstmachung von persönlichem Verhalten auf CO₂ Ausstoß. Die Leute schrauben eine Energiesparlampe ein und denken sie haben etwas für die Umwelt getan und gleichzeitig benutzen sie ihren

Wäschetrockner und fliegen einmal im Jahr nach Thailand. Weil sie sich gar nicht dessen bewusst sind, welche Auswirkungen ihr Verhalten hat. Wenn man jetzt im Supermarkt einkaufen würde und alle importierten und eingeflogenen Waren würden extra markiert werden, dann würde das vielleicht schon etwas bewirken. Es würde auch etwas bewirken wenn alle ihr CO₂ Budget einmal im Jahr vorgelegt bekämen ohne dass es zu bestimmten Konsequenzen kommt. Da fehlt dieses Bewusstsein bei dem Großteil der Bevölkerung.

Was sagen sie zu dem Argument das bei einer Implementierung eines PCT Konzept auch jeder dazu gezwungen wird CO₂ Reduktion als 2. Währung wahrzunehmen. Damit würde es ja sehr viel langfristige Planungsfaktoren geben, eine Steuer gibt nur einen kurzfristigen Planungshorizont. Und wenn dem Großteil der Bevölkerung jetzt das Wissen bezüglich dem direkten Zusammenhang ihrer Emissionen und der Steuer gar nicht klar ist, dann verschenkt man da doch Potential und Gedanken?

Konzeptionell ist es in der Tat attraktiv, man muss aber bedenken wenn man die Steuer langsam anheben würde, dann würde sich auch mehr bei der Bevölkerung regen als bei einer einmaligen Aktion. Wie es auch bei der Ökosteuer der Fall war. Es ist natürlich schwierig so etwas durchzuhalten, durch alle politischen Wetterlagen. Deshalb ist ja auch die Ökosteuer wieder abgeschafft worden und dieser fuel escalator in Großbritannien ja auch. Letztendlich braucht man das für alle Rohstoffe, weil bisher die ganzen Effizienzgewinne durch Komfortzuwachs verpuffen. Das ist also in der Tat attraktiv, aber wie soll das System eingeführt werden.

Letztlich ist mein Gedanke, dass das vorhandene System wesentlich leichter zu verändern ist, als ein völlig neues einzuführen, wenn man jetzt die politische Praktikabilität anschaut. Aber wenn man jetzt mal auf die sozialen Aspekte schaut, nichts könnte gerechter sein. Aber was passiert zum Beispiel mit Hartz-IV Empfängern. Was passiert wenn eine Familie besonders sparsam mit ihrem CO₂ Ausstoß umgeht, weil ansonsten das Geld knapp ist. Und andere mit genug Geld kaufen sich einfach ihre Lizenzen ein. Allerdings hätte man das bei einer Steuer auch.

Aber da ist ja ein großes Gegenargument, dass auch wenn Lizenzen von Menschen in den höheren Einkommensklassen dazugekauft werden, die Rückflüsse ja dann auch teilweise an Menschen in den unteren Einkommensklassen fließen, welche ihre verkauft haben. Da wird dann ja quasi die ärmere Bevölkerung von der reicheren bezahlt. Man kann auch die unteren Bevölkerungsschichten, die unter dem Konzept zu

den Verlierern zählen würden, mit anderen Mitteln unterstützen, finanzielle Unterstützung oder mehr Lizenzen.

Dafür können dann Menschen in den unteren Klassen viele andere Sachen nicht tun. Man hat diese Ungleichheit sowohl bei einer Steuer als auch bei einem PCT Programm. Man muss da auch beide Seiten anschauen und sich Mechanismen überlegen mit denen man das abfedern kann. Wir haben jetzt schon in Deutschland abertausende Haushalte die ihre Energierechnung nicht bezahlen können. Wir nennen das Energiearmut. Das Problem haben wir jetzt schon, wir müssen uns für beide Konzepte, Steuer und CO₂ Handel die sozialen Auswirkungen anschauen. Wie hoch ist der Aufwand für die Einführung dieses Systems. Wenn wir uns den CO₂ Handel anschauen, EU weit funktioniert er. Da hätten wir *(Anmerkung: Deutschland)* sonst eine Steuer eingeführt, die administrativ sehr einfach zu bewältigen gewesen wäre. Steuern sind ein etabliertes System. Bei der Einführung des EU CO₂ Handel wurden auch sehr viel Arbeitsstellen beschafft, viele Behörden gegründet, da steckt enorm viel Transaktionsaufwand dahinter. Während die Steuer viel weniger Kosten verursacht hätte und vermutlich den gleichen Effekt gehabt hätte. Und dann hat man noch das Problem mit den ganzen politischen Auseinandersetzungen, das erst ab 2012 ein CO₂ Handel zustande kommen wird der möglicherweise etwas bewirkt. Das ist ja gar nicht gewährleistet. Schließlich kann es ja gut sein das der stark wachsende Anteil der erneuerbaren Energien in Deutschland das Cap dann locker werden lässt.

Bisher wurden ja auch die Lizenzen umsonst verteilt.

Beim letzten Mal wurden nur 10% verkauft. Dafür standen dann Fördergelder bereit. Beim persönlichen CO₂ Handel wird es auch erstmal enorme Aushandlungsprozesse geben, wer weiß worauf man sich dann einigt. Vielleicht 10 Tonnen pro Kopf, das ist im Moment der Status quo. Also die Reduzierung dieses Budget ist von der politischen Durchsetzbarkeit gedacht außerordentlich aufwendig. Ich hätte aber auch nicht gedacht das ein EU weiter CO₂ Handel zustande kommt, der ja weitaus weniger komplex ist als dann so ein persönlicher CO₂ Handel.

Nach der Finanzkrise würde dann ein solch umfassendes Programm, wie es PCT darstellt, doch auch die Wirtschaft in eine bestimmte Richtung beleben. Dadurch dass man auf einmal für CO₂ Emissionen bezahlen muss, wird dann auch auf Unternehmensebene etwas stimuliert in Bezug auf grüne Technologien. Vor allem auch die Automobil Industrie, welche ja bisher noch nicht so fleißig war. Da jetzt nach

der Finanzkrise die Wirtschaft ja auch ohnehin wieder stärker reguliert wird, wäre PCT als Instrument vielleicht sehr passend?

Da würde ich jetzt einwenden dass der Emissionshandel wie er jetzt EU weit schon ist, auch kann. Natürlich erfasst er viele Branchen gar nicht. Im Prinzip ist es auch ein knallhartes Instruments. Ich propagiere auch eine Renaissance des Ordnungsrechtes, es ist zwar verpönt, wird aber vermutlich wieder kommen. Es gibt ja ganz viele Sachen die zum Beispiel die Ökodesign Richtlinie, die jetzt vorgibt das Elektronikgeräte nur noch 1 Watt im Stand-by verbraucht. Das ist eine ordnungsrechtliche Vorgabe die aber sehr großen Effekt hat. Alle Appelle haben da bisher nichts bewirkt. Wenn Geräte von der Richtlinie her weniger verbrauchen dürfen, dann hat sich schon das Problem erledigt. *(Anmerkung: Das sich der Haushalt darum kümmern muss)* So könnte man zum Beispiel im PKW Bereich, da gab es ja jetzt diese freiwilligen Vereinbarungen, die nicht geklappt haben und am Ende sind die Autos immer größer geworden. Man könnte aber auch einfach auf Regierungs- oder EU Ebene sagen, wir lassen nur noch Fahrzeuge zu die maximal 1.3 Tonnen wiegen und dann gehen wir Stück für Stück auf eine Tonne oder so runter. Und so kann man in ganz vielen Bereichen vorgehen. Ich spreche immer von absoluten Grenzen und Leitplanken. Ein einfaches Beispiel hierfür wäre das Tempolimit. Eigentlich wundert es, dass das nicht schon längst eingeführt wurde. Und da merkt man da mangelt es nicht an politischen Instrumenten um den Klimawandel zu stoppen, sondern am politischen Mut und Willen. Mit dem CO₂ Handel kann man sich davor halt drücken.

Ist es dann generell so das Großbritannien da mutiger ist?

Die führen ja auch keine Gewichtsklassen für Fahrzeuge oder ähnliches ein. Man könnte das auch in der Landwirtschaft so machen. Das der Pestizidausstoß sich in einem gewissen Rahmen hält und man dann sagt in beispielsweise 10 Jahren muss er auf dem Stand vom ökologischen Landbau sein. Von der Umsetzung her, vom administrativen Aufwand, ist so etwas wirklich simpel. Man müsste nur Kontrollen machen, aber das tun ja die ganzen Ökokontrolleure auch schon. Die Briten haben erstmal eine andere Ausgangsmentalität in der Debatte. Wenn man jetzt mal die bedenken systematisch durchgeht. Erst der extrem hohe administrative Aufwand, dann kommt es zu einer Delegation der Verantwortung von Staat auf den Bürger also eine parallele zu den Reformen der sozialen Sicherungssysteme. Das liberale Gedankengut der letzten 20 Jahre das man sich als Staat zurückzieht und der einzelne übernimmt mehr Verantwortung. Markt vor Staat ist da auch das Motto. Immer mehr Kosten selbst übernehmen und selbst Verantwortung übernehmen. Berufsunfähigkeitsversicherung ist abgeschafft worden mit der Idee immer mehr

Verantwortung an den einzelnen zu übertragen. Jetzt muss man sich fragen warum hat es das überhaupt gegeben, Rentensystem, der einzelne denkt einfach nicht weit genug. Angenommen es gäbe keine gesetzliche Rentenversicherung und jeder müsste selbst entscheiden, dann gäbe es in 30 Jahren eine ganz massive Altersarmut. Weil die Menschen nicht vorausschauend genug planen. Das ist der Grundgedanke warum man bestimmte Verantwortungen als Staat für die Menschen übernommen hat. Beim Klimawandel muss man jetzt natürlich alle ansprechen. Der Staat kann die Menschen aus diesem Dilemma befreien in dem er Regeln schafft die alle Menschen gleichermaßen betreffen. Zum Beispiel das Tempolimit ist ja deswegen auch so hochsolidarisch. Alle sind davon gleich betroffen. Der Mann in seiner S-Klasse wie jemand in seinem Panda. Bei dem individuellen CO₂ Budget als auch bei der Ökosteuer da fühlen sich die Menschen ungerecht behandelt. Die einen können weitermachen wie bisher und andere werden beschnitten. Da muss man dann mit leben.

Wobei das ja bei dem CO₂ Handel eher kurzfristig ist. Langfristig müssten sich ja 99% der Bevölkerung reduzieren. Da das national Cap ja dann jährlich runtergesetzt wird. Wer weiß wie viel Überschuss Lizenzen es dann immer noch gibt. Aber langfristig sollten sich ja schon alle reduzieren müssen.

Aber wenn es gehandelt wird. Dann müsste man ja ausschließen, dass man handeln kann. Auch das wäre dann ein möglicher Ansatz. Weil durch den Handel bildet sich ja auf dem Markt ein Preis den immer irgendjemand bezahlen kann. Das ist ja jetzt beim CO₂ Handel auch so. Man geht nur davon aus dass betuchte Menschen dann auch sparsamer damit umgehen. Es kann ja auch so sein das die viel mehr Potenzial haben zu reduzieren mit Effizienztechnologien weil die sich die leisten können im Gegensatz zu Armutshaushalten. Was passiert mit armen Menschen in schlecht gedämmten Häusern, weil die brauchen ja dann ein wesentlich höheres CO₂ Budget. Da wird's dann kompliziert, da müsste man dann spezifisch die Budgets berechnen, je nachdem wie die Leute wohnen. Administrativ unmöglich.

Aber bei einer Einführung würde es ja auch eine gewisse Vorlaufzeit geben. In dem Moment könnte man ja Haushalten auch noch mal gewisse Möglichkeiten aufzuzeigen und im Gegensatz zu einer Ökosteuer müssten sie nicht sofort bezahlen. Vermutlich wird es ja dann auch erstmal mit dem normalen Ausstoß Cap eingeführt damit die Eingewöhnungsphase gewährleistet ist.

Ja da würde man dann sagen, Ökosteuer kann man abschaffen.

Eigentlich wird doch auch mit einem PCT Programm die politische Landschaft etwas übersichtlicher gestaltet. Im Moment gibt es ja da eine Vielzahl von verschiedenen Regelungen und Gesetzen. In der Implementation ist natürlich PCT weitaus aufwendiger aber ist es nicht auf lange Sicht dann administrativ weniger Aufwand?

Ja so könnte man argumentieren. So argumentieren ja auch die Emissionshandel Befürworter. Der ganze Kram, Ökosteuer, könntet ihr euch alles schenken wenn ihr nur den gescheiterten Handel einführt. Das ist eine Frage des Zuganges. In Wuppertal sind die meisten skeptisch, auch gegenüber dem Handel den wir jetzt schon haben, also dann auch gegen den persönlichen Handel. Ich kenne aber auch Leute die sehr starr orientiert sind das der Staat das tun muss, die zugleich sich für einen persönlichen CO₂ Handel stark machen, weil Sie sagen das ist das einzige das etwas bringen würde. Mit dem man wirklich die Probleme in den Griff bekämen. Da gibt es aus wissenschaftlicher Sicht keine klare Empfehlung und die wird es auch nie geben. Selbst wenn sich jetzt die Politik darauf einlassen würde, dann würden erstmal zig Gutachten in Auftrag gegeben und die würden zum Ergebnis haben sowohl als auch. Aber bei der Ökosteuer die ist ja 20 Jahre diskutiert wurden und da gab es dann so viele Gutachten. Und die einen haben dann gesagt es würde 300 000 Jobs schaffen und die anderen haben gesagt es würden 200 000 Jobs verloren gehen. Das ist ein klassisches Expertendilemma, insofern wird sich bei dieser Debatte mit dem persönlichen CO₂ Handel wenn es dann weiter hoch kommen würde im politischen Entscheidungsprozess, was ich eigentlich erwartet habe, weil es für viele Branchen eine wunderbare Debatte ist um von gegenwärtigem Handeln abzulenken. Ob dieses System jemals eingeführt wird oder nicht ist offen. Aber wenn die Debatte ins laufen käme dann würden erstmal ganz viele Beschlüsse aufgeschoben werden mit dem Argument vielleicht kommt ja bald der persönliche CO₂ Handel. So läuft halt Politik und da würde dann sehr lange geschachert werden und je ehr man ins Detail schaut und desto mehr Ausnahmeregelungen. Was passiert mit Geschäftsreisen und solchen Dingen. Von meinem Gefühl her, wir schaffen es noch nicht mal im bestehenden System die schrauben etwas anzuziehen und wie soll man dann so etwas Unglaubliches gelingen, in die Welt zu bringen. Vom Konzept her sehr attraktiv von den Realisierungsmöglichkeiten sehr gering. Man sollte jetzt einfach das tun das man kann, die Möglichkeiten die offen stehen nutzen. Wenn man in die Tiefe schaut, es gibt da zahlreiche Schwierigkeiten. Stromproduktion ist jetzt ja schon in den Handel eingebunden.

Es ist ein sehr liberaler Ansatz, der sich auf die Verantwortung des Einzelnen stützt. Ich bin der Überzeugung dass gegenwärtig mit den vorhandenen Konzepten schon deutlich mehr

passieren könnte. Allerdings wäre es besser wenn es sich auf europäischer Ebene durchsetzt, das wäre wahrscheinlicher als eine Durchsetzung in einem einzelnen Land. Es würde vermutlich auch 10-15 Jahre dauern bis man zu einem Konzept kommen würde mit dem gearbeitet werden kann. Wenn man sich die Parallele zum gegenwärtigen CO₂ Handel ansieht. In der Zeit liegen ganz viele andere politische Maßnahmen auf Eis, weil sie über dieses neue Konzept nachdenken. Angenommen Hamburg würde sagen „wir dürfen pro Kopf nicht mehr als 4 Tonnen CO₂ emittieren und alles was wir zusätzlich emittieren, dafür müssen wir uns freikaufen“. Dann hätte die Stadt Hamburg natürlich einen enormen Anreiz den Bürgern zu helfen, und natürlich auch die Bürger selbst weil sie das durch Steuern sonst rückfinanzieren müssten, das Budget zu reduzieren. Aber einige Sachen kommen ja einfach nicht auf den Weg weil unsere Politiker nicht mutig genug sind. Man könnte auch im Gegenteil argumentieren, angenommen die FDP klemmt sich jetzt voll hinter PCT als ein ideales Konzept, dann könnte man sagen die sind ja besonders mutig, man kann auch das Gegenteil sagen nämlich das ist ja eine super Strategie um andere Entscheidungen jetzt erstmal aufzuschieben. Ich denke solange es solche Sachen wie ein Tempolimit nicht gibt, die einfachsten Grenzen, solange braucht man über weitere politische Instrumente gar nicht nachdenken. Entweder man geht offen damit um und sagt wir probieren was wir können mit den derzeitigen Instrumenten oder man sagt wir wollen unserer Wirtschaft das eigentlich nicht zumuten, weitere Beschränkungen und auch den Bürger nicht beschränken weil dann die Wiederwahl gefährdet ist. Wenn man auch diese frustrierenden Klimaverhandlungen betrachtet, die sind alle gescheitert weil alle Staatsvertreter Angst um die nationale Wirtschaft hatten. Alles was getan werden müsste, könnte das Wirtschaftswachstum gefährden. Und das ist ja auch allgemein der Grund der oft im Weg steht. Die Automobil Industrie beispielsweise. 130gr CO₂ pro km, was ist das für ein mutloses vorgehen gewesen. Wie soll es da im gegenwärtigen politischen Klima so etwas Großes wie persönlicher CO₂ Handel auf den Weg kommen. Das sehe ich einfach nicht.

Es gibt auch ein neues Buch von Franz Groll das zusätzlich in die Richtung geht, dass durch das sinkende Bevölkerungswachstum langfristig allemal umstrukturiert werden muss. Da hätte dann so eine Umstrukturierung mit PCT auch etwas die langfristig nachhaltigere Gestaltung der Wirtschaft zufolge. Eine Wegbewegung von zu vielen kurzfristigen Planungsfaktoren und Profitzielen.

Das Wirtschaftswachstum stellt sich ohnehin die Gretchenfrage, womit wir *(Anmerkung: Das Wuppertal Institut für Klima, Umwelt und Energie)* uns auch in der Veröffentlichung „Zukunftsfähiges Deutschland“ befasst haben. Allgemein so etwas wie eine Umweltbibel, für allgemein in Nachhaltigkeit interessierte Leser. Da hatten wir auch eine Forschungsrunde ob

wir ein individuelles Emissionshandelkonzept mit rein nehmen in die Studie, 1998 ist sie erschienen. Da haben wir uns damals entgegen entschieden, da war ich auch sehr ernüchtert über die Einstellung von meinen Kollegen zum europäischen CO₂ Handel. Weil da einige Kollegen die mit dem Thema arbeiteten, gar nicht entschlossene Befürworter waren. Wobei der Handel bisher auch eher als katastrophal eingeschätzt werden kann. Jetzt wird ja in 2012 auch etwas angezogen, aber da muss man mal abwarten. Bei der gegenwärtigen Periode kann Deutschland mit den clean development mechanism sogar mehr emittieren als in der Periode davor. Die Verhandler haben dafür gesorgt dass so viele Schlupflöcher vorhanden sind, dass das System bisher auch noch keinerlei Wirkung erzeugt hat. Jetzt kann man wieder auf 2012 hoffen. Aber auch da gibt es schon wieder jede Menge Befürchtungen, dass das ohne Effekt vorüberziehen wird. Man kann da wirklich eine gesunde Skepsis an den Tag legen. Das hat ja aber erstmal nichts damit zu tun das Ganze vom Konzept her zu beleuchten. Etwas kann vom Konzept her gut sein, aber dann sollte man auch ehrlicherweise sagen welche Chancen das in der politischen Entscheidungslandschaft hat. Es geht ja nicht immer darum welches ist das beste Konzept, sondern wie ist die politische Durchsetzungsfähigkeit und was sind die Menschen gewohnt. Und da haben wir jetzt jede Menge etablierte Instrumente, mit der Ökosteuer zum Beispiel, die ja auch 20 Jahre gebraucht hat um auf den Weg zu kommen. Und soll man die jetzt einfach wegschmeißen für etwas anderes völlig Ungewisses. Es ist auch letztlich so dass die Demokratie vor ihrer größten Bewährungsprobe steht. Sie ist in der Krise. Das liegt auch daran das die Leute kurzfristig denken und dann auch Leute wählen die kurzfristig denken. Welcher Politiker springt schon über seinen Schatten. Gerhard Schröder ist abgewählt worden für Hartz-IV, nach meiner Einschätzung eine mutige Form. Da liegt es nach meiner Wahrnehmung näher, dass wir so einen fuel escalator auf dem Weg bringen. Dazu braucht es allerdings Leute die sagen, gut ich bringe das jetzt auf den Weg, auch mit dem Risiko abgewählt zu werden.

Wobei das vielleicht auch viel daran liegt das die Bevölkerung nicht hinreichend über solche Themen informiert ist. Da gibt es auch viele Studien in Großbritannien in denen Fokus Gruppen nach der Aufklärung über PCT vor die Wahl einer Steuer, upstream trading und PCT gestellt wurden. Da wird dann von der Mehrheit PCT als Instrument bevorzugt. Könnte man da nicht auch noch viel Unterstützung gewinnen wenn man noch etwas mehr die Bevölkerung aufklärt?

Ein klassisches Argument, welches allerdings nach meiner Einschätzung täuscht. Sie wissen, dass Strom gelb ist? Das weiß jeder, da sind 300, 400 Millionen Euro für diese Kampagne in die Hand genommen wurden. Und das war nur eine einfache Floskel. Stellen

sie sich mal vor die Bürger hätten über den Euro abgestimmt. In Deutschland wäre der ganz klar abgelehnt worden. Das hat schon 10 Jahre gedauert bis auch die letzten Politiker die Vorteile verstanden haben, wie soll man da der breiten Bevölkerung über Medienkampagnen so etwas beibringen. Das halte ich für aussichtslos. Mittlerweile bin ich ein Gegner von Volksentscheiden. Über solche Sachen wie den Euro abzustimmen ist eine Katastrophe. Wenn man sich schon Hamburg anschaut, wie die Eliten die Öffentlichkeit instrumentalisiert haben, oder in Berlin Tempelhof. Das ist eine sehr frustrierende Sache. Die Leute mit viel Geld können dann Kampagnen ins Leben gerufen, die andere Bürgerinitiativen nicht finanzieren können. Das ist ja das Argument bei Volksentscheiden, dass man die Menschen nur gut genug informieren muss und dann können sie eine ordentliche Entscheidung treffen, aber wenn man schaut was alles auf der politischen Agenda steht, dann ist unmöglich alles zu erklären. Auch einzelnes, wie die Ökosteuer, da sind ja die Leute wild geworden. Die Presse, die Bild, hat damals alle aufgehetzt mit schlechten Schlagzeilen und die Bürger sind voll drauf angesprungen. Da kann man jetzt sagen da hätte man besser informieren müssen, aber da hat die Bundesregierung damals Millionen ausgegeben, für Plakate und ähnliches. Das kostet ja alles Unsummen und dann kommt gleich der Bundesrechnungshof und erhebt Einspruch. Das ist schon eine schwierige These. Wenn man jetzt sagt über Fokus Gruppen, über repräsentative Gruppen haben wir ermittelt das die Leute eher für PCT als für Steuern sind, dass man dann auch davon ausgehen kann das die breite Mehrheit das akzeptiert, davon bin ich nicht überzeugt. Zu den meisten politischen Instrumenten hat es ja vorher auch Befragungen und Fokus Gruppen gegeben. Auch zu der Ökosteuer. Auf kommunal Ebene kann man das besser machen. Auf Bundesebene würden ein paar Fokus Gruppen nicht ausreichen.

Aber generell kann man sagen es gibt schon viele gute Argumente für das Konzept. Das ist nicht von der Hand zu weisen, deshalb hat es auch eine gewisse Zugkraft und Attraktivität. Ein Mittelweg wäre nach meiner Wahrnehmung nach ein Verfahren zu entwickeln damit die Erfassung vereinfacht wird und dann könnte es hingehen bis zu einer CO₂ Karte für jeden. Und dann bucht man ab und das hätte ja dann vermutlich schon vom Bewusstsein her einen enormen Effekt. Das System so einzuführen kann man auf jeden Fall befürworten, ohne das das ein Handel oder Verrechnung stattfindet. Und wenn man dann merkt das hat sich über Jahre bewährt, die Leute können damit umgehen, dann könnte man ja anfangen die Caps zu reduzieren. Es wäre nur fatal wenn man das politische Voranschreiten auf anderen Wegen damit behindern würde.

Vielen Dank für dieses Gespräch.

Questionnaire 1:

Questionnaire developed for David Fleming, the originator of the TEQs scheme.

22.07.2010

- **How would you assess the evaluation of the DEFRA (Department for Environment, Food and Rural Affairs) and subsequently the House of Commons from 2008 that a Personal Carbon Trading scheme is “ahead of its time”?**

I do not think the DEFRA research programme was a helpful analysis in any sense. The various models in discussion vary profoundly. No evidence has ever been offered that “personal carbon allowances” or “cap and share” represent a feasible model. Indeed, it is clear that both of them are absurd. “Personal carbon trading” would include only individuals, so that different arrangements would have to be made for two different energy markets for (1) individuals, and (2) all other energy users. It is obvious that such a market would break down quickly.

As for “Cap and Share”, this is based on money, rather than not on actual quantities of energy. But every system must have some guarantee of actual energy rights for every individual – that is, some form of entitlement or rationing. In the absence of such rights, any shortage of energy will lead immediately to energy-famine for those individuals that do not have the money/power/luck to get hold of the energy they need. Cap and Share does not have any such concept of rights. Indeed, Cap and Share is intriguing because of the complete absence of any of the criteria needed for an effective system to reduce fossil fuel dependency.

The criteria are:

1. A *guarantee* that the defined budget for reduction in fossil fuels will in fact be implemented.
2. *Time to plan ahead* to make the big changes in our whole energy-economy that are needed. At least a 20-year time horizon is needed.
3. *Leaves money with the user*. The scheme should not (like tax) take money away from people. They will need all the money they can get in order to survive increasing energy shortages and make the needed changes in their lives.
4. *Equity*. It should treat people equally.

5. *An assured ration.* It should ensure that people have a basic entitlement to energy in conditions of scarcity.
6. *Specified in terms of energy.* The *numéraire* should be energy, not money. If it is specified in terms of money people will simply devote their time to challenging the prices (as you say in your note).
7. *Both for fuel scarcity and climate.* Any scheme must be equally suited to conditions of *both* energy scarcities (peak oil, etc), and reductions in carbon emissions (in the context of climate change).
8. *Ownership.* People should think of the scheme as their own scheme. If it works it will be because of their own commitment to it. It cannot, therefore, be a top-down scheme (such as taxation or the EU-ETS).
9. *Government there to help.* The government must be free to devote its whole effort to enabling everyone to live within the budget. Its role should not be that of issuing regulations instruments of control.
10. *Competitive advantage.* It should be consistent with trade – so that the countries with TEQs schemes have the advantages of energy efficiency and the relevant technologies.
11. *Pull.* It should provide all participants with an intrinsic incentive. They need to want to reduce energy use for its own sake, rather than simply being motivated to do so because of a system of rewards if they do and punishments if they do.
12. *The common purpose* – A shared aim to reach a shared goal: where collective aims are advanced by the individual purpose, and individual aims advanced by the collective purpose

The problem with the DEFRA reports is that they were not in fact based on the TEQs scheme. Instead, the authors assumed that the available schemes were simply different “flavours” of the same thing. That is, to say, the report was wholly disconnected from reality. It is interesting that the researchers made no attempt to get in touch with the Lean Economy Connection. There is no evidence that the writers of the report on the economic implications of personal carbon trading and even taken the trouble to look at the TEQs website or read the book. In short the project was carried through in deep ignorance of the scheme.

It may tell us something about modern life – or perhaps just British society – that the civil servants instructed to evaluate a model did not think it is necessary to make a telephone call to its inventor or even to read his description of it.

- **Would you think the implementation of a Personal Carbon Trading scheme is still in the realm of possibilities after the financial market crisis?**

Without any doubt. It is hard to see any way in which it can be avoided. In the future, there will be an energy shortage. This will be for either or both of two reasons:

1. Because of oil depletion (peak oil) and/or shortages of other energy forms (such as gas or nuclear-generated electricity).
2. Because of reductions in the availability of fossil fuels as a result of a successful programme to reduce carbon emissions.

Many people find it hard to understand this point: For either, or both, of those reasons (peak oil and climate change), there will be significant shortages of energy. You will not be able to buy the petrol or electricity you need. Under these circumstances, it will be essential (as stated above) to have a rationing system. What alternative is there? If there is a rationing system, it will have to be either a paper rationing system (as during World War II), or an electronic system. But it can't be a paper rationing system because energy users' needs for energy vary so much – every person and every firm needs different amounts, and this means that there will need to be some system for trading. Paper rations are highly unsuited to this. Think about it! Clearly it will need to be an electronic system – and that means TEQs.

I have no doubt, therefore, that TEQs will be implemented. The danger is that nothing is done until there is an energy crisis or a climate crisis – but that is too late. It might take two years to establish and test a TEQs scheme. We need to have one available as soon as possible. We are already running into danger without one.

- **Some voices claim that the financial market crisis would have had less impact if our economies were already located in a process towards more ecologic (and subsequently economic?) sustainability. Do you agree with this and where would you see intersections between economic and ecologic policy?**

Yes, I agree with is, sort-of. But I don't think the analysis is very good. If we were *really* in a sustainable economy we would be using almost no fossil fuels. We would have net zero or even net *negative* carbon emissions. Our use of resources would be a fraction of what it is now. We would have much more informal (non-monetary) trading, and we would be less dominated by the market and financial flows. The market economy that we have now is very

vulnerable and fragile; it is highly-connected through a small number of hubs (the technical term in network theory is “scale-free”) – and if just a few of those hubs break down, the system as a whole will break down. The market is taut – that is tightly-linked together, and when those links break, whole sectors of the market break down.

So *of course* the financial crisis would have far less impact if we were in a condition of sustainability! I wonder about your question!

The connections between economic and ecological policy – Oh, where to start? Economic *policy* means growth. Sustained growth will destroy the ecology. The economy cannot exist without growth. Yet it depends on the ecology, too. And the ecology cannot co-exist with an economy that sustains growth. This is the problem of our time, and no one knows the answer to it. There probably isn’t the answer. If there is a future for us it will have to be a radically different future – one in which we do not have a growth dependent economy. But how do you do that? My forthcoming book tries to answer that, but it has taken 20 years study to get there, and it takes us a long way beyond the world of “interactions between economic and ecological policy.” [Point of language “interactions” is the best word here; “intersections” are places where motorways join up!]

- **A lot of individuals have also been affected by the financial crisis through devalued financial investments. Might the British population now be more willing to invest their money in tangible assets like a home solar photovoltaic system to provide their own clean energy?**

I don’t know! I think people will probably be less willing to invest in such tangible assets, simply because they have lost a lot of money and are feeling poor. They are also probably less willing to believe anything anyone tells them, particularly where someone is promising a payback!

- **The German professor Claudia Kemfert argues that in the aftermath of the financial crisis overall carbon emissions are lower than in times of an economic boom and that therefore emission abatement targets are more feasible. Would it be easier to implement a Personal Carbon Trading concept in a recession in terms of adaptation?**

No. I see what Prof Kemfert means but I don’t really agree with her. The reduction in emissions that has followed the financial melt-down is trivial in comparison with the reduction

in the use of fossil fuels that lies ahead – either as a result of peak oil or as a result of action on climate change. The point is that we need to recognise that if we are to *cope* with the coming reductions in energy use (as distinct from simply suffering and perhaps dying because we have less energy) we are going to need to make radical changes not only in energy conservation but also in the whole structure of our society. We are going to have to live in different places, use land and transport differently, grow food differently and in different places, and do different jobs. We have to rebuild our society, and localise our towns, villages and industry. These changes will be very expensive and they will take a long time. We have to have at least a 20-year time-horizon. These conditions will only exist if we have money, a sense of confidence and the experience of stability. The recession may make us worry more about the future, but to do something constructive about it we don't need recession, we need an effective framework – that is, the top-down AND bottom-up framework of TEQs. I do not believe there is any way of achieving the needed revolution in our understanding and use of energy other than a TEQs scheme. It is as important as that.

- **How would you assess the concept for international use? Would it be beneficial or obstructive to implement the scheme in all EU countries?**

TEQs is specifically *not* an international scheme. An effective system is not one enormous system that does one thing. It is a network (panarchy) of subsystems each of which is designed for the scale at which it operates. Remember the System-Scale Rule: “Large-scale problems do not need large-scale solutions. They need small-scale solutions working within a large-scale framework”.

So, TEQs are designed for the national level. There can be an international framework, within all nations operate their own TEQs scheme. And there can be regional frameworks, such as a European Union “bubble” setting an agreed collective target for all member states, but the states themselves will have their own TEQS schemes as means of achieving the commitment defined in the bubble. Each nation should have a TEQs scheme operating to a budget specifically designed for its own levels of energy usage; and each scheme depends on national populations having a sense of ownership of the scheme: it is *their* scheme; unit prices are under their collective control (because prices respond to the level of demand for energy, relative to the budget at that time).

Implementation of a single TEQs scheme in all EU countries would fail. It would have all the stresses of the present EU currency crisis but worse. But it is not necessary to do so. TEQs is designed to be organised on a national basis. The EU could establish very powerful

first-user advantages by being the first group of nations in the world to establish the scheme. But it needs to do so quickly because, if energy shortages begin before a TEQs scheme is in place, we will be in trouble.

- **Do you have a suggestion to whom I could/should talk as well?**

UK Matt Prescott matt.p.prescott@gmail.com

Sweden (Member of European Parliament) Anders Wijkman anders@wikman.nu

Sweden (Member of Parliament) Per Bolund per.bolund@riksdagen.se

I will try to think of others.

Good luck!

David Fleming for Franziska Teichmann, 22 July 2010.

Additional questions:

- **Do you, and if yes, where do you see economy stimulating potential of a TEQs scheme, especially after the financial market crisis?**

I do not believe that TEQs have potential to stimulate the economy. This is not the purpose of the scheme. An important principle of good systems-design is to focus on a specific aim, and not to burden it with a range of other aims which are essentially irrelevant.

I am often asked whether TEQs have other benefits of this kind. The potential as an alternative currency at a time of hyperinflation, or their ability to redistribute wealth, are two of the additional “benefits” about which I am asked. The scheme does not deliver these benefits. Nor does it walk the dog.

I call this question the “Does it walk the dog question.” It doesn’t. And it shouldn’t.

Having said that, TEQs does indeed stimulate the economy in the following sense. If it is the only available means of phasing-down demand for fossil fuels on the scale needed by climate change and by depleting supply, then TEQs have a vital function in sustaining the economy in an orderly and functioning condition, where the alternative would be collapse. But I wouldn’t call this “stimulating the economy”. I would call it the only available means of enabling our economy and society to survive the loss of the abundant fossil fuel energy on

which they depend. The question is not whether we can stimulate the economy, but whether in the future there will be a functioning economy at all.

- **The financial crisis leaves behind tightening regulations and more governmental interference within the respective economy. Could this climate be seen as beneficial for the introduction of the scheme since it would also strongly regulate an economy?**

I am sorry to say this question fails to recognise the principle at the heart of the TEQs scheme. It is NOT a form of regulation. It is a form of anti-regulation. TEQs is explicitly designed to make almost forms of energy-related regulation unnecessary. Instead, it simply takes note of the quantity of fuels that will be available in the future and shares those quantities out to energy users. The energy users can then do what they like with the fuel. They would be well advised to work out ways of reducing their use of fuel, but their decisions about what to do and how to do it is based on PULL. It is not based on PUSH – that is, on regulation.

We will not succeed in reducing energy dependency by a regime of regulation. Nor by financial incentives. We will only succeed in this aim by making it completely clear how much energy (and which kinds) are available now and will be available in the future, guaranteeing that people get their fair shares, and providing an incentive – known in systems theory as a “forcing function” – for individuals to work out how to do it. But they will not be left on their own to work it out. Communities, technical experts, the government, neighbours – everyone will be on hand to enable everyone else to achieve this extremely difficult aim. This is known in my work as the “common purpose”, where individuals are motivated to contribute towards collective aims.

The fact that in your question you describe TEQs as a scheme which would strongly regulate the economy illustrates the difficulty we are having in explaining the principle of TEQs. If you can still think that after studying it so intelligently, what hope is there for anyone else?

OK, if you want to make a link between TEQs and the tightening regulations of our time, then I think you should look instead at the opposite principle which is being strongly developed in the UK at the moment. The Conservative Party went into the election with (perhaps) the most interesting manifesto in British history – the idea of the Big Society, which is the principle of bringing citizens back into decision-making and into running their own affairs, instead of leaving it to government and regulatory agencies. The Big Society is the same

principle as that of “presence” which I have developed in my book, and TEQs were developed with that in mind.

It is true that banking regulations are being developed all over the place but I believe that the Big Society is the spirit of the age, and TEQs fit into it perfectly. As you see, this – in common with all other new, unfamiliar, radical ideas – is hard to get across to people. They think “What is the catch?” It may take years.

But we don’t have years. Our Prince Charles said the other day that we only have 100 months to save the climate!

- **I have encountered the argument that although a TEQs scheme is very attractive, the political decision-making process would very likely stretch over several years in which other environmental policy proposals would be dismissed in anticipation of a decision on the scheme’s future. What do you think about that?**

This is a very common question and I am glad you asked it. I think we may be in a situation where our society is unable to agree to any solution which would be effective. Its effectiveness rules it out. We have no trouble in agreeing to ineffective schemes, and we do not believe that we should even be asked to consider any other kind of scheme.

The problem is not just that democracy is about asking for what we want, and getting it. It is deeper than that. Sustainable Development has this flaw built into it. There are rigorous definitions of sustainable development (e.g. Herman Daly) but the received meaning of sustainable development is that it is a policy which enables us to continue to develop (i.e. grow) as before – with no changes to our way of life and expectations – while at the same time applying clever technologies in ways which will solve the environmental problem for us at the same time.

This is a very attractive proposition. It gets us out of jail free. Advocating it shows that we are green, aware of environmental problems, yet we are also responsible, focusing on the task of keeping our economy and society forging ahead as before. Brilliant.

Now the TEQs solution comes along and says, “Look, we really have to take this seriously. We must quickly reduce our dependence on fossil fuels. We must guarantee fair access to energy at the same time. We must awake out of our delicious dream that someone else

(probably scientists somewhere) will solve our problem and we don't have to do anything ourselves.”

There is a real likelihood that our society is incapable of seeing reality in this way. But the problem is not a problem with TEQs themselves. It is a problem with ANY scheme that would require us to get real.

Actually, as I said in my last notes, I think ANY effective scheme would have to have the same ingredients of a clearly-defined Budget corresponding to the needed rate of reduction in carbon emissions and/or to the decline in the availability of fuel, along with individual entitlements to maintain an orderly distribution of energy and prevent energy-famine. And that means, of course, that when we suggest that what the planet needs is a real-world effective scheme, we are saying it really has to go along with the TEQs model or something very like it.

But yes, I have my doubts as to whether our society is capable of adopting a real scheme. And one way of not adopting it would be to spin out the discussions for several years. People will accuse TEQs of all sorts of things – do you want a list of the insults I have heard? – but all this is a form of denial.

On the other hand, when people do apply their minds to the system, there comes a point at which they “get it”. There is a brilliant opportunity here of seeing a convergence between the Big Society, presence, and lean thinking (pull) – and to establish a solution for the real world.

And don't forget that it would be hard to imagine a scheme which is less intrusive and authoritarian than TEQs. I buy energy (combined gas and electricity) four times a year, by direct debit. I am never aware of buying energy. Under a TEQs scheme, I would – on those same occasions four times a year – surrender TEQs units by direct debit, automatically, without having actually to do anything. That's all. Shock! Horror! What a terrible scheme! I would be so paralysed with anxiety that I would not even be able to get out of bed in the morning!

David Fleming for Franziska Teichmann 27 July 2010

Questionnaire 2:

Questionnaire developed for Richard Starkey, Research Fellow at the Tyndall Centre for Climate Change Research, University of Manchester.

28.07.2010

- **How would you assess the evaluation of the DEFRA (Department for Environment, Food and Rural Affairs) and subsequently the House of Commons from 2008 that a Personal Carbon Trading scheme is “ahead of its time”?**

When Alice wants to end her relationship with Bob, she may say, “Bob, it’s not you, it’s me”. This of course may just be a polite way of saying “Bob, it’s not me, it’s you”! Having chatted at length with the economist who wrote the Defra report, I think Defra’s statement that PCT is “ahead of its time” may well be a polite way of saying “no thanks”! However, please do not quote me on this.

- **Would you think the implementation of a Personal Carbon Trading scheme is still in the realm of possibilities after the financial market crisis?**

For all other questions see below.

- **Do you, and if yes, where do you see economy stimulating potential of a TEQs scheme, especially after the financial market crisis?**
- **The financial crisis leaves behind tightening regulations and more governmental interference within the respective economy. Could this climate be seen as beneficial for the introduction of the scheme since it would also strongly regulate an economy?**
- **I have encountered the argument that although a TEQs scheme is very attractive, the political decision-making process would very likely stretch over several years in which other environmental policy proposals would be dismissed in anticipation of a decision on the scheme’s future. What do you think about that?**

- **The German professor Claudia Kemfert argues that in the aftermath of the financial crisis overall carbon emissions are lower than in times of an economic boom and that therefore emission abatement targets are more feasible. Would it be easier to implement a Personal Carbon Trading concept in a recession in terms of adaptation?**
- **How would you assess the concept for international use? Would it be beneficial or obstructive to implement the scheme in all EU countries?**

COMMENT

1. Imagine that prior to the recession some research is done comparing TEQs, Cap and Dividend (C&D), Cap and Share (C&S) and a carbon tax with equal per capita recycling of tax revenue (CT).
2. The research concludes that that one of these instruments is most appropriate. (For the sake of this discussion is doesn't matter which one,)
3. There is then a global recession.
4. After the recession, does the comparison need to be redone? Only if there is an the result of the comparison might be different as a result of the recession. However, from what you've written above, I can see no argument as to why you think the result of the comparison may differ as the result of a recession. To me this is the key question you need to address.

ADDITIONAL COMMENT

Yes, the Lean Economy Initiative (LEI) does question Defra's figures. But this doesn't mean that the LEI is correct. To be credible, your work needs to critically assess the response of the LEI – and indeed the ippr– to Defra's work.

- **Do you think the TEQs scheme has economy stimulating potential?**

Even if the answer is “yes”, the answer might also be “yes” for other instruments. So one still has to choose between instruments. I know I’m repeating myself but I just want to emphasize that the question of which instrument is appropriate is *necessarily* comparative.

- **I have encountered the argument that although a TEQs scheme is very attractive, the political decision-making process would very likely stretch over several years in which other environmental policy proposals would be dismissed in anticipation of a decision on the scheme’s future. What do you think about that?**

First, there are many who don’t find TEQs very attractive, Defra and the ippr amongst others. Second, any policy making system that decided to implement TEQs and wasn’t irrational would find ways of dealing with the long implementation time.

- **David Fleming argues that because of peak oil some sort of energy rationing must be implemented in the future. The German author Franz Groll says that after oil depletion, economies are likely to move to coal as main energy resource and that introducing energy rationing must result because of climate change. Which scenario do you consider more likely?**

David Fleming sees two possible uses for electronic rationing: (1) rationing emissions rights (2) rationing oil rights (which is slightly different from rationing oil). In most of his writings it is (1) rather than (2) which is highlighted but I think (2) is an interesting idea. In essence he is arguing that (a) conventional oil will peak soon (b) post-peak, rationing will be needed (c) electronic rationing is the appropriate means of rationing. Of course some people question (a) and one could accept (a) but question (b). But all very interesting. Haven’t come across Franz Groll but, surely, if climate change is going to be meaningfully tackled, then no fossil fuel of any type will be able to be combusted (without CCS) after 2040.

VII Affidavit

Eidesstattliche Erklärung

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