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Introduction

Climate change has become "potentially the greatest challenge to global stability and security" (UK Cabinet Office, 2008). Yet, in spite of the severity and importance of the threats caused by global warming, little progress has been made towards the development of effective policies. In light of the reluctance of governments to implement radical changes in economic and environmental policies, this paper investigates what role individual citizens can play in the fight against climate change. Specifically, the paper critically examines the growing market for ecological products and services, such as low-emission cars, solar-powered technologies, and food with low carbon footprints. How do private businesses sell products that (purport to) help combat global warming and climate change, i.e. what products do they offer, and what rationalities and strategies do they use to market these products? In short, can a market approach present a suitable complementary to national and international environmental regulation, and what its potential problems are in comparison to regulatory policies?

Since 2006 the threat of global climate change has gained increasing media attention.[1] In particular Al Gore's film "An Inconvenient Truth" facilitated a news media and advertisement campaign that turned jute bags into fashion items, had leading newspapers "off-set" the CO_2 emissions of their travel section reporters, and created regular columns such as "The Eco-Worrier" to educate readers about environmentally-friendly consumer choices.[2] Rather than leading to demands for political action, Gore's wakeup call to global warming has resulted in a discourse that suggests that the solution to global warming can be found in changing consumer behaviour. Given the Neoliberal credentials of the United Kingdom (UK) and its recent governments this appears a suitable course to take. Already in the 1990s, the New Labour government attempted to link economic growth, environmental protection and resource development through the concept of 'sustainable consumption'.[3] Instead of

[1] Maxwell T. Boykoff, 'The Cultural Politics of Climate Change Discourse in UK Tabloids', *Political Geography*, 27, no. 5 (2008), p. 553.
[2] 'How to be an eco-slut', *Company Magazine*, 2006; 'Eco-Worrier', *The Times*, weekly.
[3] Kersty Hobson, 'Competing Discourses of Sustainable Consumption: Does the 'Rationalisation of Lifestyles' Make Sense?' *Environmental Politics*, 11, no. 2 (2002), pp. 95-120; Gill Seyfang, 'Shopping for Sustainability: Can Sustainable Consumption Promote Ecological Citizenship?' *Environmental Politics*, 14, no. 2 (2005), pp. 290-306; Kersty Hobson, 'Sustainable Consumption in the United Kingdom: The "Responsible" Consumer and Government at "Arm's Length",' *The Journal of Environment and Development*, 13, no. 2 (2004), pp. 121-139.

"prescriptive changes to practices", the UK government has argued that market-oriented policies can lead to a 'win-win' situation in which private businesses *and* the environment can benefit from the development of new products and services.[4] Citizens play a major role in this scenario since they are supposed to shape the market through the increased consumption of ecological goods. To encourage demand for such goods, the policies of the UK government have ranged from improved labelling of products and environmental certification schemes to public education such as the "nation-wide 10 million sustainable consumption multimedia advertising campaign ... 'Are you doing your bit?'"[5]

Despite the promotion of environmental consciousness, so far little progress has been made towards changing consumption patterns in the UK. The number of licensed vehicles, for instance, increased by almost 3 percent annually between 1980 and 2007, cancelling out cuts in emissions achieved by energy efficient motors.[6] Private consumption has played a major role in this trend. Statistics show that the proportion of households in the UK with access to two cars has risen from 13 to 26 percent, while the number of households without a car has declined from 41 to 21 percent.[7] Domestic electricity consumption has increased by 33 percent over the same time period, with first decreases noted in the past two years.[8] In addition, the number of leisure flights has risen from 12 million in 1980 to 45 million in 2007.[9] Short-haul flights, which are the most detrimental to the environment, make up about 80 percent of these.

The failure of UK consumers to live up to the expectations of their government with regard to the environment has been a puzzle. Surveys have indicated that a large number of citizens are in favour of products with a lower impact on the environment. Yet, few consumers buy 'green' products and services. Many studies have investigated this gap between consumer attitude and action.[10] They have observed that many factors can have a

[4] Hobson, 'Sustainable Consumption in the United Kingdom', p. 124.
[5] Hobson, 'Sustainable Consumption in the United Kingdom,' p. 126; Hobson, 'Competing Discourses of Sustainable Consumption,' p. 102-3.
[6] Hobson, 'Sustainable Consumption in the United Kingdom,' p. 129; Department for Transport, *Transport Trends 2008 Edition* (Newport: National Statistics, 2008), p. 19.
[7] Department for Transport, *Transport Trends 2008 Edition*, p. 21.
[8] Department for Business, Enterprise & Regulatory Reform, *Energy Consumption in the United Kingdom: Domestic Data Tables, Update 2008*, at: http://www.berr.gov.uk/energy/statistics/publications/ecuk/page17658.html.
[9] Department for Transport, *Transport Trends 2008 Edition*, p. 79.
[10] Hobson, 'Sustainable Consumption in the United Kingdom,' p. 130; Ben Lane and Stephen Potter, 'The Adoption of Cleaner Vehicles in the UK: Exploring the Consumer Attitude-Action Gap,' *Journal of Cleaner Production*, 15, no. 11-12 (2007), pp. 1085-1092; James A. Roberts, 'Green Consumers in the 1990s: Profile and Implications for Advertising,' *Journal of Business Research*, 36, no. 3 (1996), pp. 217-231; Christer Berglund and Simon Matti, 'Citizen and Consumer: The Dual role of Individuals in Environmental Policy,' *Environmental Policy*, 15, no. 4 (2006), pp. 550-571.

negative influence on 'green' consumption, including lack of information, cost and habit.[11] The typical conclusions are that citizen-consumers need further education and that ecological products require clearer certification and labelling. Another is that consumers need to be coaxed towards ecological behaviour by a combination of "carrots" and "sticks".[12]

However, the supply-side of the equation, i.e. the question of whether the private consumer market offers sufficient and adequate choice of ecological products and services, is equally important. As one consumer research participant complained: "When I go into a supermarket and ask for certain items, they say, 'oh there isn't the demand for it'".[13] While a large number of studies have examined and critiqued the commodification of the environment in from macroeconomic perspectives such as global capitalism and neo-liberalism, the microeconomic problems of seeking to turn environmental issues into products for sale have been under-researched.[14] This paper seeks to help address this gap by investigating two questions. Firstly, how can private firms convert an inherently collective good like climate change into products and services for sale? Secondly, why has the consumer demand for such products and services remained low?

To answer these questions, this paper is structured in three sections. The first section discusses the commodification of climate change from the perspective of Collective Goods Theory. It suggests that the products and services offered by private businesses in the name of fighting global warming fall into three ideal-type categories: impure private goods, impure collective goods and pure collective goods. The second section examines the provision and marketing of these goods in three cases: the 'green' car, renewable electricity and carbon offset schemes. The third section discusses how these goods have been perceived by the media and the consumers, and how both the marketing and consumer reception of 'green products' have contributed to limiting the demand for them. In conclusion, the article argues that the commodification of climate change offers only a partial solution. While new products can help reduce greenhouse gas emissions in some areas, the interest of private businesses in

[11] Hobson, 'Sustainable Consumption in the United Kingdom,' p. 131; Roberts, 'Green Consumers in the 1990s,' p. 218;

[12] Alex Coad, Peter de Haan and Julia Sophie Woersdorfer, 'Consumer Support for Environmental Policies: An Application to Purchases of Green Cars,' *Ecological Economics*, 68, no. 7 (2009), pp. 2078-2086, p. 2078; Joanna Collins, Gillian Thomas, Rebecca Willis and James Wilsdon, *Carrots, Sticks and Sermons: Influencing Public Behaviour for Environmental Goals*, Demos/Green Alliance Report for DEFRA (London: Demos, 2003).

[13] Hobson, 'Competing Discourses of Sustainable Consumption,' p. 112.

[14] Julian Saurin, 'Global Environmental Crisis as the 'Disaster Triumphant': The Private Capture of Public Goods,' *Environmental Politics*, 10, no. 4 (2001), pp. 63-84; Peter Newell and Matthew Paterson, 'A Climate for Business: Global Warming, the State and Capital,' *Review of International Political Economy*, 5, no. 4 (1998), pp. 679-703.

generating profits and the interests of the consumer in private benefits set inherent limits to the effectiveness of a market-oriented policy towards climate change.

The Commodification of Climate Change

Collective Goods Theory seeks to explain what goods and services private companies are likely to offer for sale and which have to be supplied by the state because of market failure. To do so, Collective Goods Theory distinguishes all goods and services in terms of two characteristics. One is the excludability of such products, i.e. the ability to exclude potential consumers from the benefits of a good or service. Examples of excludable products are items such as cars or houses. These goods typically belong to individual consumers who are the only beneficiaries or who are at least able to control who else may use them. Non-excludable goods, by contrast, are free for the taking. They include things such as fresh air or rainwater. The other feature is the rivalry of goods, i.e. whether the benefits of a good or service are divided among its users or equal for all. The more users a rival good has, the fewer are its benefits for each of them. The stereotypical example of a rival good is food. The more people share a loaf of bread, the less there is to eat for each. Non-rival goods and services do not suffer from depreciation. They retain the same user value no matter how many consumers there are. TV broadcasting is a prime example of a non-rival good. It has the same quality irrespective of the number of viewers who watch a programme.

Based on these two sets of categories, Collective Good Theory distinguishes between four ideal-types of goods and services. Firstly, goods and services that are both excludable and rival are called 'private goods'. They are very common and range from washing powder to electricity. Secondly, products and services that are excludable, but non-rival, are termed 'club goods'. They benefit a limited group of users. Club goods include databases and computer programmes. Thirdly, goods and services that are non-excludable, but rival are called 'common pool goods'. Common pool goods are very rare and typically occur in nature such as fishing and hunting grounds. Fourthly, products and services that are both non-excludable and non-rival are 'collective goods'. They are also small in number and the examples commonly mentioned in the literature include traffic lights and lighthouses.[15]

As the difficulty of finding examples for the four ideal-types suggests, there are few examples of 'pure' goods or services. In many instances, it is possible to find exceptions or

[15] Inge Kaul, Isabelle Grunberg and Marc A. Stern, 'Defining Global Public Goods,' in ibid. (eds.) *Global Public Goods. International Cooperation in the 21st Century* (New York: Oxford University Press), pp.2-27, pp.3-4; Hugh Stretton and Lionel Orchard, *Public Goods, Public Enterprise, Public Choice* (New York: St. Martin's Press, 1994), p. 54.

limitations. Even fishing grounds are circumscribed since the fishing fleets of many countries claim distinct marine territories for themselves. Similarly, online databases can suffer from rivalry if too many users log on at the same time and a system crashes. Nevertheless, the distinction between these four ideal-types of goods helps to explain why some goods can be commodified, i.e. sold for profit, more easily than others. According to Collective Goods Theory, the key factor is excludability. Only if the benefits of a good or service can be restricted to paying customers, the latter are willing to part from their money for it. If the same benefits can be had for free, it is very difficult to persuade somebody to pay for a good. The tendency of consumers to free-ride on goods and services which are free for the taking, suggests that profit-oriented companies are unlikely to supply non-excludable goods and services. In these cases, Collective Goods Theory argues, the state has to step in. The state can overcome the free-rider problem because it can force citizens/users to pay for non-excludable goods or finance them through taxes. Commercial businesses are also likely to favour rival goods because they are consumed and have to be reproduced. Non-rival goods and services, by contrast, sometimes suffer from illicit distribution because users can distribute their access rights or the goods without reducing their own benefits. Examples range from the copying of books or CDs to the downloading of information and music. In sum, the preceding arguments suggest that commercial producers are most likely to produce private goods and least likely to supply collective goods.

From the perspective of Collective Goods Theory the commercial production of goods and services that contribute to fighting climate change presents a puzzle because it appears to be a pure collective good.[16] The benefits of fighting global warming are both non-excludable and non-rival. To be sure, the effects of climate change are distributed unevenly around the globe. However, who will be the winners and who will be the losers, or whether there will only be losers, remains to be seen.[17] The lack of certainty about the consequences of global warming, the speed of the change and its irreversibility, suggest that everybody will benefit from reducing the causes of climate change; if only to gain time to adapt. Foremost among the "very likely" reasons for the current rise in global temperatures and the changes in weather patterns and ocean currents is the increased emission of greenhouse gases such as carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4) and ozone (O_3) "due to human

[16] Some studies conceptualize the issue of climate change as an unintended 'cost', i.e. an negative externality to other public and private goods. See for instance, Coad et al., 'Consumer Support for Environmental Policies,' p. 2078. This article not only adopts reverse psychology by viewing the fight against climate change as a positive good, but also shows how this 'good' can be sold for profit.

[17] Karen L. O'Brien and Robin M. Leichenko, 'Double Exposure: Assessing the Impacts of Climate Change within the Context of Economic Globalization,' *Global Environmental Change*, 10, no. 3 (2000), pp. 221-232.

activities".[18] The cutting of these emissions is in the interest of everybody. However, because nobody can be excluded from the benefits, the reduction of greenhouse gas emissions is prone to free-riding. Countries and citizens might support the call for speedy action to fight climate change, but they are likely to resist carrying the cost of such action.

The Kyoto Protocol at the international level and the resistance of industry pressure groups to radical policies leading to emission reductions at the national level illustrate the difficulty of agreeing on measures to cut greenhouse gases and the general inclination to free-ride. The commercial sale of products and services which contribute to the fight against climate change should be even more difficult. Nevertheless, the past few years have witnessed the emergence and growth of a market for goods and services which lower the release of greenhouse cases, in particular CO_2. These 'low-carbon' products, such as local food and electricity from solar and wind power, have left the realm of environmental activism and become commodified. Although the market size remains small, a growing number of firms are developing and offering self-professed 'green' or 'ecological' products and services. The question therefore arises: how can businesses commodify what appears to be a pure collective good?

A preliminary survey of the types of goods and services offered under the low-carbon label suggests an answer. Private firms offer pure collective goods only in exceptional cases.[19] Instead, the goods and services sold on the private market to reduce greenhouse gas emissions appear to fall into three categories. The first category includes conventional products with reduced emissions, such as energy efficient cars and refrigerators or food from local farms. These products are best defined as impure private goods since their benefits are primarily excludable and rival. The main concern of buyers and users is the traditional purpose of these products. In the cases listed above, they include a flexible means of transport, the preservation of food and the taste of fresh vegetables. Only secondarily do these products contribute to a collective good in terms of reduced greenhouse gas emissions.

The second category of products and services aims to reduce greenhouse gas emissions, but has also another purpose. They include technologies and practices such as double glazing and insulation, solar and wind energy, and energy efficiency consulting. This

[18] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Synthesis Report* (Geneva: IPCC, 2008), p. 5, p. 82.

[19] Matthew J. Kotchen, 'Impure Public Goods and the Comparative Statistics of Environmentally Friendly Consumption,' *Journal of Environmental Economics and Management*, 49, no. 2 (2005), pp. 281-300; Matthew J. Kotchen and Michael R. Moore, 'Private Provision of Environmental Public Goods: Household Participation in Green-electricity Programs,' *Journal of Environmental Economics and Management*, 53, no. 1 (2005), pp. 1-16.

category can be conceived of as impure collective goods since their aim is the cutting of emissions, but they also have private benefits for the consumer, such as lower heating or electricity bills.

Only the third category regards goods and practices that have the sole purpose of lowering greenhouse gases, such as carbon-offset schemes, emission credit trading and other forms of donations. Since all their tangible benefits are non-excludable and non-rival, they can be considered pure collective goods.[20]

As with all analytical categories, there are several ways of combining these features in practice. Some companies offer conventional products which include a small donation as part of the purchase. The Product Red merchandise which supports the fight against HIV/AIDS in Africa is an example. In the field of climate change, a typical illustration is the carbon offsetting included in the cost for flight tickets or 'green' holiday packages. Other goods and services seem to fall between the first and second categories such as recycling products. Recycling plays a major part in reducing emissions, but recycling products such as toilet article and plastic containers are bought largely for their private use value. Nevertheless, the preceding distinctions help illuminate some of the features of the low-carbon market in industrialized countries. Collective Goods Theory explains, for instance, why firms might be interested in combining these categories. Most customers can be expected to be more likely to pay for a collective good if it also contains some private rewards. To some customers, however, it might appeal if a private good also has collective benefits. EDF Energy uses both strategies to sell its "Green" electricity product. The supply package not only promises to collective advantages by contributing "to renewable energy projects across the UK", but also provides additional private incentives through a "free home energy efficiency audit".[21]

The following section examines in detail how low-carbon products and services can be commodified. Given the limited scope of this article, it focuses on three examples to illustrate the categories of goods outlined above: the 'green' car, renewable energy, and carbon-offset schemes.

'Low-Carbon' Products and Services

In order to understand and evaluate the techniques and strategies that private firms use in order to profit from the fight against climate change this section examines three questions: (1) what types of products do private firms offer, (2) how (much) do these products contribute to

[20] Intangible benefits such as the nice 'warm feeling' of altruism are exempt from this analysis.
[21] EDF Energy, at: http://www.savetodaysavetomorrow.com/.

lowering CO_2 emissions, and (3) how are these products marketed? All three questions help to understand whether firms provide indeed collective goods and what may limit consumer demand.

The 'Green' Car

Transport is the second largest source of CO_2 emissions in the UK.[22] Moreover, emission rates in this sector have continued to increase against all efforts. Since "household use of private vehicles" is responsible for 42 percent of total transport emissions, the automobile industry plays a major role in the fight against climate change.[23] So far this role has been explored primarily in terms of the technological development of 'green' cars and the consumer demand for such vehicles.[24] The definition of 'green' cars differs widely between the expert literature, the government, the automobile industry and the media. Experts speak of 'low-carbon' cars with regards to automobiles emitting less than 100g CO_2 per kilometre.[25] The UK government, therefore, excludes cars meeting this standard from vehicle tax. Carbon emission is also the basis of the UK Vehicle Excise Duty (VED) scheme introduced in 2001 which links the amount of tax payable for private vehicles to types of fuel and levels of CO_2 discharge. To help prospective buyers, the government, in collaboration between the automobile industry and the Low Carbon Vehicle Partnership, has encouraged the voluntary introduction of a label for 'Fuel Economy'. However, the label is confusing for three reasons. Firstly, while the term 'fuel economy' relates to miles per gallon (MPG) or litres per 100km, the industry label refers to carbon dioxide emissions. Secondly, in contrast to the expert definition the label marks, literally, as 'green' all cars that produce less than 150g CO_2 per kilometres. Thirdly, the label uses the same alphabetical labels for CO_2 emission categories as the VED tax scheme, but its units are different. In particular the label that refers to emissions of 141-150g CO_2 is coloured light green, despite having a higher VED than the lower two tax bands which have the same fuel economy label colour. Another definition of 'green' cars can be found in public and media discourses. These typically associate the term with hybrid and electric motors. As will be shown below, both do not necessarily produce less CO_2 than petrol or diesel engines. Finally, the term 'green' may refer to cars adapted to

[22] Department of Energy and Climate Change, *2008 UK Greenhouse Gas Emissions*, 26 March 2009, at: http://www.defra.gov.uk/environment/statistics/globatmos/index.htm
[23] Department for Transport, *Transport Trends 2008 Edition*, p. 110.
[24] Matthew Paterson, 'Car Culture and Global Environmental Politics,' *Review of International Studies*, 26, no. 2 (2000), pp. 253-270; Lane and Potter, 'The Adoption of Cleaner Vehicles in the UK'; Coad et al. 'Consumer Support for Environmental Policies'.
[25] Lane and Potter, 'The Adoption of Cleaner Vehicles in the UK', p. 1085.

use alternative sources of fuel such as ethanol, hydrogen, natural gas or biodiesel.[26] The automobile industry uses this definitional confusion about what is a 'green' car for its own purposes by labelling also models environmentally friendly that have merely average emissions of CO_2.

Table 1. VED and the 'Fuel Economy' Label

Band	**CO_2 emission (g/km)**	**12 months tax rate**	**Fuel Economy Label (colour)** [27]
A	< 100	-	A (dark green)
B	101-110	£35.00	B (green)
C	111-120		
D	121-130	£120.00	C (light green)
E	131-140		
F	141-150	£125.00	
G	151-165	£150.00	D (yellow)
H	166-175	£175.00	E (light orange)
I	176-185		
J	186-200	£215.00	F (dark orange)
K*	201-225		
L	226-255	£405.00	G (red)
M	Over 255		

To gain a first picture of the supply and marketing of 'green' cars, this section examines the products and British websites of the five automobile manufacturers with the largest market shares in the UK: Ford (17%), Vauxhaull (14%), Volkswagen (8%), Toyota (5%) and Audi (5%).[28] With the exception of Audi, all companies offer an explicitly 'green' vehicle range. Ford's "ECOnetic" range includes three models, Vauxhall's "ecoFLEX" range includes five and Volkswagen's "BlueMotion" range has six models. Only Audi does not use the 'eco' label to identify specific models with low CO_2 emissions. However, it has several engines which meet standards comparable to those of its competitors.

Among these ranges only Toyota's Prius has a hybrid petrol and electric engine [See Table 2]. All the others have conventional petrol and diesel motors. They achieve fuel efficiency and lower carbon emissions by means of minor technical changes, such as superior aerodynamics, fuel efficient engines, low weight, low rolling resistance tyres, low-viscosity transmission oil and diesel particulate filters. Only two of these cars meet the expert standard

[26] See 'Green Technologies and Alternative Fuels' at: http://www.greencar.com/.
[27] See http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenershopping/DG_064874.
[28] The Society of Motor Manufacturers and Traders Ltd., *New Car Registrations*, 7 May 2009, at: http://www.smmt.co.uk.

of CO_2 emissions below 100g/km: the Ford Fiesta ECOnetic and the Volkswagen Polo Blue Motion. Both have diesel engines. The remainder have emissions between 100-160g/km.

Table 2. 'Green' Cars

Company	**Model**	**Engine**	**Miles/gallon (Litres/100km)**	**CO_2/km**
Ford	Fiesta ECOnetic 1.6 TDCi DPF	Diesel 90PS	76.3 (3.7)	98g
Ford	Focus ECOnetic 1.6 TDCi	Diesel 90PS	65.7 (4.3)	114g
	Focus ECOnetic 1.6 TDCi DPF	Diesel 109PS	65.7 (4.3)	115g
Ford	Mondeo ECOnetic 1.8 TDCi	Diesel 125PS	53.3 (5.3)	139g
		Diesel 115PS	54.3	139g
Vauxhall	Agila ecoFLEX	Petrol 65PS	56.5	119g
		Diesel 75PS	62.8	120g
Vauxhall	Corsa ecoFLEX	Diesel 75PS	>70.6	105-119g
Vauxhall	Astra ecoFLEX	Diesel 110PS	62.8	119g
Vauxhall	Zafira ecoFLEX	Diesel 110PS	53.3	139g
Vauxhall	Insignia ecoFLEX	Diesel 160PS	54.7	136g
Volkswagen	Polo Blue Motion 1.4 TDI DPF	Diesel 80PS	74.3 (3.8)	99g
Volkswagen	Golf Plus Blue Motion1.9 TDI DPF	Diesel 105PS	58.8 (4.8)	127g
	Golf Estate Blue Motion 1.9 TDI DPF		61.4 (4.6)	122g
Volkswagen	Jetta Blue Motion 1.9 TDI DPF	Diesel 105PS	61.4 (4.6)	122g
Volkswagen	Passat Blue Motion 2.0 TDI	Diesel 110PS	57.6 (4.9)	128g
Volkswagen	Touran Blue Motion 1.9 TDI DPF	Diesel 105PS	52.3 (5.4)	144g
Volkswagen	Sharan 2.0 Blue Motion TDI DPF	Diesel 140PS	47.1 (6.0)	159g
Toyota	Prius 1.5 VVT-i E-CVT	Hybrid 99PS	65.7 (4.3)	104g
Toyota	Aygo 1.0VVT-i	Petrol 68PS	61.4 (4.6)	108g
Toyota	Yaris 1.0 VVT-i	Petrol 70PS	52.3 (5.4);	127g
	Yaris 1.3 VVT-i	Petrol 101PS	48.7 (5.8)	136g
Toyota	Yaris 1.4 D-4D	Diesel 90PS	62.8 (4.5)	119g
Toyota	Auris 1.4 D-4D	Diesel 90PS	56.5 (5.0)	131g
Audi	SE 1.4 TFSI	Petrol 125PS	(5.7)	113g
Audi	SE and Standard 1.9TDIe engine	Diesel 105PS	62.8 (4.5)	119g
Audi	SE 2.0 TDI engine	Diesel 140PS	(5.1)	134g

Compared to the average private vehicle's emission of 160g/km in the European Union these 'green' models hardly present a major contribution to the fight against climate change. On the contrary, they indicate that the market supply of environmentally friendly cars is still far away from the European Commission target of an average emission of 95g/km for the year 2020.[29] In order to achieve this aim radical technical innovations are necessary. So far, the major car companies are not offering such products. Although new developments are and have been in the pipeline for some time, few have reached the sales shops. In sum, the five largest automobile companies in the UK have been rather half-hearted in their exploration and generation of a new market for low carbon vehicles.

Their use of CO_2 emissions as a marketing device has also been limited. Audi does not even attempt to sell its vehicles as 'green', while Ford, Vauxhall and Volkswagen do little to highlight their 'eco'-model ranges on their websites or in their brochures. On most websites, the potential consumer has to search specifically for 'eco' cars in order to be directed to the relevant models. Neither do the companies use the voluntary 'Fuel Economy' label to promote their products. Most websites instead refer to the VED bands which have excludable benefits for the prospective buyer because they relate CO_2 emissions to personal cost savings. Also more important than the labelling scheme are awards and consumer reviews in the press, such as the 'Green Car of the Year' award, Fifth Gear, autocar.co.uk and cleangreencars.co.uk.[30] The primary focus of websites and brochures is on fuel efficiency and the associated financial savings of 'green' cars due to lower petrol consumption and road tax. The benefits for the environment and the fight against global warming are considered secondary. Companies even emphasize that they pursue environmental benefits only as far "as possible today, without compromising your driving experience".[31] As Volkswagen writes, "We looked at every way to make our cars cleaner and more efficient, while still being great to drive".[32] In this context, the companies portray radical new inventions in a negative light. According to them advantages can be found in an "intelligent refinement of existing technology", while more extensive innovations are often described negatively as "different", "expensive" and "bolted on".[33]

In sum, the 'green' car market focuses on the supply of private goods. Although low-carbon vehicles might contribute to decreasing the threat of climate change, the car

[29] See http://ec.europa.eu/environment/air/transport/co2/co2_home.htm.
[30] See http://www.ford.co.uk/Cars/FordECOnetic.
[31] See http://www.ford.co.uk/Cars/FordECOnetic.
[32] See http://www.volkswagen.co.uk/volkswagen-world/environment/blue-motion.
[33] See http://www.volkswagen.co.uk/volkswagen-world/environment/blue-motion and http://www.ford.co.uk/Cars/FordECOnetic.

companies market these models primarily in terms of private and excludable benefits.[34] Foremost are fuel and tax savings, followed by criteria like "fun" and "driving experience".[35] Collective benefits such as environmental protection are clearly subordinate to private concerns and are pursued only as long as they do not restrict private pleasure and gain. Albeit implicit in the relationship between fuel consumption and CO_2 emissions, the major UK car companies have not yet fully explored the potential for a 'win-win' situation by producing and promoting a larger choice of vehicles with a high MPG ratio and lower carbon emissions. Rather they have attempted to limit their investment cost by introducing minor modifications to existing models. It can be assumed that the sunk cost of automobile production plants are an important impediment to extending the production of fuel efficient cars. The next section shows that the high start up cost of new technologies which cut greenhouse gas emissions can nevertheless be overcome and new profitable markets be created.

Renewable Energy

Household energy consumption accounts for 27 percent of CO_2 emissions in the UK.[36] Nearly 90 percent of UK primary energy production derives from carbon sources such as oil, gas and coal.[37] The development and use of renewable energy sources for the private sector is an important factor in the fight against climate change. Specifically, renewable energy refers to energy "obtained from the continuing and repetitive currents of energy occurring in the natural environment, and includes non-carbon technologies such as solar energy, hydropower, wind, tide and waves, geothermal heat, as well as carbon neutral technologies such as biomass".[38] Over the past decade, however, the supply of renewable energy in the UK has increased only minimally, reaching 6.3 percent of total electricity production in 2009.[39] It remains woefully short of the target of 20 percent by 2010 set by the government in 1998,

[34] For other analyses of environmental marketing strategies see Veronica Wong, William Turner and Paul Stoneman, 'Marketing Strategies and Market Prospects for Environmentally-Friendly Consumer Products,' *British Journal of Management*, 7, no. 3 (1996), pp. 263-281; Ken Peattie, 'Golden Goose or Wild Goose? The Hunt for the Green Consumer,' *Business Strategy and the Environment*, 10, no. 4 (2001), pp. 187-199; Ken Pattie and Andrew Crane, 'Green Marketing: Legend, Myth, Farce or Prophesy?' *Qualitative Market Research*, 8, no. 4 (2005), pp. 357-370.

[35] Ibid.

[36] Brenda Boardman, *Home Truths: A Low-Carbon Strategy to Reduce UK Housing Emissions by 80% by 2050*, ECI Research Report 34 (Oxford: University of Oxford, 2007), p. 11.

[37] International Energy Agency, *United Kingdom*, at: http://www.iea.org/textbase/stats/pdf_graphs/GBTPESPI.pdf.

[38] IPCC, *Climate Change 2007*, p. 80.

[39] Department of Energy and Climate Change, *Energy Statistics*, Press Notice, 24 September 2009, at: http://www.decc.gov.uk/en/content/cms/statistics/publications/trends/trends.aspx.

and is unlikely to meet the current revised target of 15 percent by 2020.[40] Academic research has sought to explain this failure in terms of two factors: governmental policies and customer demand.[41] This section investigates what role energy companies have played in shaping the renewable energy market. To do so, it analyses five renewable energy suppliers in the UK: British Gas, Scottish and Southern Electric (SSE), Ecotricity, Green Energy and Good Energy. While the first two belong to the 'Big Six' traditional energy companies, the latter three have emerged as small firms with a particular focus on 'green' energy. What types of 'green' energy do they supply and how is renewable energy marketed to private consumers?

The renewable energy sector is one of the most extensive, but also one of the most confusing markets for environmental products and services in the UK. As of 2009, nearly all British energy suppliers offer some kind of 'green' tariff. Already among the five companies examined for this study, it includes eight different schemes with a broad mixture of energy sources, and additional benefits and services. In the main, 'green' energy tariffs include one or several of the following three core elements: 'green' electricity supply, 'green' energy funds and carbon offsetting.[42] The 'Zero Carbon' tariff by British Gas, for instance, provides electricity from 100 percent renewable sources and a 100 percent carbon offset of the customer's electricity consumption. It's 'Future Energy' tariff offers 100 percent green energy supply and a contribution to the 'Energy for Tomorrow' fund which develops renewable energy generation.

Many companies have increased the percentage of renewable sources in their main green tariffs. While British Gas's first carbon offset tariff 'Climate Aware' used electricity from carbon sources such as coal and gas, its new 'Zero Carbon' tariff provides both carbon offsetting and renewable energy. Similarly, Ecotricity has responded to growing competition by offering the 'New Energy Plus' tariff. This tariff complements Ecotricity's own renewable energy production of so far only 50 percent with another 50 percent renewable energy from

[40] International Energy Agency, *United Kingdom*, at: http://www.iea.org/textbase/stats/pdf_graphs/GBTPESPI.pdf; S.L. Batley, D. Colbourne, P.D. Fleming and P. Urwin, 'Citizen Versus Consumer: Challenges in the UK Green Power Market,' *Energy Policy*, 29, no. 6 (2001), p. 479; UK Environment Agency (2008), at: http://www.environment-agency.gov.uk/research/library/position/41201.aspx.

[41] David Toke, 'Are Green Electricity Certificates the Way Forward for Renewable Energy? An Evaluation of the United Kingdom's Renewables Obligation in the Context of International Comparisons,' *Environment and Planning C: Government and Policy*, 23, no. 3 (2005), pp. 361-374; Rolf Wüstenhagen and Michael Bilharz, 'Green Energy Market Development in Germany: Effective Public Policy and Emerging Customer Demand,' *Energy Policy*, 34, no. 13 (2006), pp. 1681-1696; David Toke and Volkmar Lauber, 'Anglo-Saxon and German Approaches to Neoliberalism and Environmental Policy: The Case of Financing Renewable Energy,' *Geoforum*, 38, no. 4 (2007), pp. 677-687; Batley et al., 'Citizen Versus Consumer'.

[42] Virginia Graham, *Reality or Rhetoric? Green Tariffs for Domestic Consumers* (National Consumer Council, 2007), p. 7.

other providers to make up a 100 percent renewable-electricity package. Additional private benefits in terms of gifts and free expert advice on energy efficiency also illustrate the increased competition among renewable energy suppliers. In particular, the traditional energy companies British Gas and SSE use such offers to attract new customers to their green tariffs. Both companies also embrace a different approach towards marketing renewable energy than the Ecotricity, Green Energy and Good Energy which specialize in green energy. While the latter extensively elaborate their green credentials, the threat of global warming and the benefits of renewable energy on their websites, British Gas and SSE simply present their tariffs and its components without further information on climate change.

In order to help consumers find their way through the variety of offers, government watchdogs and non-governmental organizations (NGOs) working in the area provide basic comparative data on all UK energy suppliers. Despite this information, the contribution made by these tariffs to cutting CO_2 emissions remains diffuse and incomprehensible to even the most determined consumer. The complexity of the subject matter, and debates among experts and companies over the 'green' credentials of the various approaches undermine rather than encourage consumer confidence in the benefits of green electricity schemes. The greatest division is between those electricity suppliers who reinvest their profits into the building of new facilities for the production of renewable energy, and those who buy existing 'green' electricity from individual suppliers and retire the Renewables Obligations Certificates (ROCs) issued by the UK government as part of its own carbon credit market. A ROC is a green certificate issued by the UK government to a generator of renewable electricity for each megawatt hour (MWh). Since the government has set an obligation of at least 9.1 percent (3 percent in Northern Ireland) renewable energy production by licensed generators in 2008-9, companies that do not produce enough renewable energy to meet this obligation can either buy ROCs from those who produce more than they need or pay a fine. Ecotricity argues that its approach of direct investments into large wind turbines and wind farms is the fastest and most efficient way of lowering CO_2 emissions. Its competitors Green Energy and Good Energy claim that the potential for such large scale projects is limited and that it is best to support microgeneration by small producers such as private households. They do so by buying up the ROCs and taking them from the carbon credit market. The idea is that the latter will drive up the price for ROCs, thus encouraging energy companies to invest in their own green energy sources rather than buying ROCs from others to fulfil the current UK government obligation.

Table 3. Renewable Energy Tariffs

Company	Tariff	Energy sources	Additional benefits	ROC's retired above legal requirement	Investment in renewable energy
British Gas	Future Energy (available only to the first 60,000 households who sign up)	100% of electricity use matched with energy from renewable sources such as wind and water	Free standby saver worth £19.99; contribution to 'Energy for Tomorrow' fund; free expert advice on how to save money and energy	None	Plans to invest £1.5 billion over the next 5 years in wind farms (2009). £38 per customer (2008)[43]
	Zero Carbon	100% of electricity use matched with energy from renewable sources such as wind and water	100% carbon emissions will be offset; contribution to 'Energy for Tomorrow' fund; support for investment in new renewable energy generation in the UK	Buys ROCs worth 12% of electricity consumption	
Scottish & Southern Electric	Better Plan	100% of energy consumption matched with hydro electricity	Free electricity monitor worth £45	None	Invested a total of £572.6m (2009) £16.31 per customer (2008)
Ecotricity	New Energy	50% from own wind turbines, 50% 'brown energy' from other producers	None	None	Invested a total of ca. £14m (2008) £401.49 per customer (2008)
	New Energy Plus	50% from own wind turbines, 50% renewable sources from other producers	None	None	
Green Energy	Pale Green	100% energy from low impact combined heat and power sources	Option of non-tradable company shares for the first 100,000 customers (max 400)	None	No direct investments
	Deep Green	100% renewable energy from other producers	None		
Good Energy		100% renewable energy from own sources and independent producers	None	Retires 5% ROCs in addition to government requirements	Planning to invest £10m into repowering its wind farm in Delabole

[43] Per customer investment data from WhichGreen League Table, cited at: http://www.ecotricity.co.uk/about/how-green-is-your-electricity-company/.

Another division is over the respective merits or demerits of particular forms of renewable energy production such as solar panels, wind turbines, hydropower or biomass generators. While a detailed examination of these issues is beyond the scope of this paper, they point to the sometimes self-destructive debates among the energy companies most committed to the fight against global warming and provide one explanation for the lack of consumer demand for 'green' energy products, the benefits of which they cannot assess.[44]

But how do private businesses sell their 'green' electricity? Foremost, green energy is sold as a private good since the electricity is provided to and benefits only paying customers. Also in the marketing strategies of green energy suppliers the primary appeal is to private interests and benefits. The price of electricity is a key factor. British Gas, SSE and Ecotricity do not charge a significant premium for their 'green' energy with a price of £460-479 per year for a medium-use customer as compared to non-renewable electricity for £430-460.[45] British Gas and SSE also offer a free standby saver and electricity monitor to new customers. Green Energy attempts to attract consumers by making non-tradable company shares available to its first 100,000 clients. Somewhat counterproductively with regards to the aim of reducing CO_2 emissions, British Gas and Ecotricity have lower prices per KWh with higher levels of consumption. Only SSE offers to reward customers who reduce their energy bill by 10 percent from last years' bill. All green energy schemes also claim to contribute to a collective good by lowering CO_2 emissions. While it is unclear in how far these schemes indeed help reduce CO_2 emissions in the UK beyond the requirements for renewable energy production already set by the government's ROC policy, the purported collective benefits seem to appeal only to a small section of the population. Companies which only supply 'green' energy such as Ecotricity, Green Energy and Good Energy specifically try to mobilize environmentally conscious consumers. They do so by engaging prospective and existing customers in the debate over renewable energy through blogs such as "Zero Carbonista" by Ecotricity founder Dale Vince and a blog by Good Energy, information about climate change and energy saving measures, and detailed comparisons of the green credentials of various energy suppliers and their approaches. The latter, however, illustrates the difficulties of these companies to convince larger groups of the population of the added utility of these schemes with regards to the fight against climate change.

[44] See debate on http://www.guardian.co.uk/environment/ethicallivingblog/2009/May/you-ask-they-answer-good-energy.
[45] http://www.consumerfocus.org.uk.

In conclusion, the 'green' energy market in the UK is divided between those companies which attempt to attract customers through private benefits and those who seek to appeal to consumers who are concerned about the collective good of fighting climate change. Neither approach has resulted in creating significant consumer demand. While 64 percent of the population, claim they would "consider switching to a green energy company", only a minority has done so.[46] A major impediment appears to be the complexity of renewable energy production and the market in ROCs, as well as heated debates among 'green' energy suppliers as to the most suitable approach. Moreover, consumer reviews such as the National Consumer Council suggest that "many green tariffs are not delivering the environmental benefits they claim to".[47] An important factor is the UK government's ROC scheme. On the one hand, this has permitted the formation of 'green' energy companies such as Good Energy and Green Energy which do not themselves invest in renewable energy sources, but buy ROCs from small, independent suppliers. On the other hand, the ROC market has complicated the issue for the consumer who can no longer clearly assess how much of their spending on renewable energy actually contributes to lowering CO_2 emissions because ROCs can be resold to businesses which do not meet the government requirement and because some companies do not provide more green energy than the 9.1 percent requirement already set by the government.

Carbon Offsetting

In contrast to 'green' cars and renewable energy, carbon offsetting is a service which provides a pure collective good, namely lowering the threat of global climate change. The basic idea behind carbon offsetting is that unavoidable greenhouse gas emissions can be cancelled out by reductions in other areas. Although offsetting does not necessarily reduce emissions below existing levels, it at least helps to prevent further increases. Since the principle of emissions offsetting has been most prominently implemented by international institutions, such as the Kyoto Treaty or the European Union Greenhouse Gas Emissions Trading System (EU ETS), so far little academic research has been conducted on carbon offsetting as a market for private consumption.[48] Nevertheless, a number of studies attest that

[46] Graham, *Reality or Rhetoric?*, p.1.
[47] Ibid.
[48] Emma Paulsson, 'A Review of the CDM Literature: From Fine-tuning to Critical Scrutiny?' *International Environmental Agreements*, 9, no. 1 (2009), pp.63-80; Dieter Helm and Cameron Hepburn (eds.) *The Economics and Politics of Climate Change* (Oxford: Oxford University Press, 2009).

private demand for carbon offsetting has been growing considerably.[49] Analytically it is possible to distinguish between two types of private carbon offset markets. The first type has developed as a derivative of international emission trading schemes such as the Clean Development Mechanism (CDM) established under Article 12 of the Kyoto Treaty and the EU ETS. In these cases carbon offset firms buy emission credits from strictly monitored international programmes for emissions trading among states and sell them on to private clients. The Certified Emission Reductions (CER) credits, awarded to greenhouse gas cutting projects in developing countries under the CDM, are the most popular. They have gained particular recognition in the UK through the Government Quality Assurance Scheme for Carbon Offsetting which seeks to indicate to consumers the respectability of particular offset schemes. The second type of market has evolved on the basis of voluntary credit systems certified by non-governmental organizations and directed primarily at corporations and individuals.[50] This section examines the five companies which have been approved by the UK Government Quality Assurance Scheme for Carbon Offsetting: British Airways, Carbon Footprint, Carbon Passport, Clear and PURE.[51] Since the basis for the UK government accreditation is the sale of CERs rather than voluntary credits, the analysis is skewed towards the first type of emission markets. However, as the following analysis will show, some of these companies also offer other kinds of carbon offset schemes in addition to CER trading.

The most striking feature of the types of services offered by the five companies is the individualization of carbon offsetting, despite the fact that offsetting provides essentially a collective good. As the basic idea of offsetting implies, it seeks to cancel out CO_2 emissions which have already been made or will be made by the client him- or herself. To do so, all firms offer detailed assessments of their client's personal 'carbon footprint' for a specific time period, including emissions from cars, motorbikes, public transport, flights, heating and household appliances. Carbon Footprint and PURE even offer deductions for responsible consumption, such as the use of energy savings devices and recycling. Behind these detailed calculations is the notion that consumers need to pay for only as many CERs as are necessary to offset their own emissions, thus giving the impression of personal and excludable benefits.

[49] George J. MacKerron, Catrin Egerton, Christopher Gaskell, Aimie Parpia and Susana Mourato, 'Willingness to Pay for Carbon Offset Certification and Co-Benefits Among (High-)Flying Young Adults in the UK,' *Energy Policy*, 37, no. 4 (2009), pp. 1372-1381; Heather Lovell, Harriet Bulkeley and Diana Liverman, 'Carbon Offsetting: Sustaining Consumption?' *Environment and Planning A*, 41, no. 10 (2009), pp.2357-2379; R. Brouwer, L. Brander and P. Van Beukering,' "A Convenient Truth": Air Travellers' Willingness to Pay to Offset their CO_2 Emissions,' *Climatic Change*, 90, no. 3 (2008), pp. 299-313.
[50] Lovell et al., 'Carbon Offsetting,' pp. 2361-2362.
[51] Act on CO2, at: http://campaigns2.direct.gov.uk/actonco2/home/features/offsetting.html.

Table 4. Carbon Offset Schemes

Company / Charity	**Products**	**Projects**
British Airways (company)	• Offsets for personal CO_2 emissions caused by flights with BA	UN certified CER credits are bought from the following projects: 1. Bayin'aobao wind farm, China 2. Faxinal dos Guedes hydroelectric power plant, Brasil 3. Xiaohe hydroelectric power plant, China
Carbon Footprint (company)	• Offsets for personal CO_2 emissions in six areas - house, flights, car, motorbike, bus & rail, secondary (food, recycling, fashion, packaging, finance) - in a personally selected period of time • Offsets for business emissions • Free site energy reduction surveys • Free expert guides • Planting of a tree in the UK • Planting of a tree in Kenya	UN certified CER credits are bought from the following projects: 1. Wind energy projects in Harshnaht, India 2. Reforestation, Kenya 3. Tree planting, UK 4. Reforestation with Maya nut trees, Americas
Carbon Passport (company)	• Offsets for personal CO_2 emissions in four areas - car, flights, home, total individual/household - • "Gift" offsets for £10, £20, a honeymoon (£50), a gap year (£65), one year (£72), a round-the-world flight (£74)	UN certified CER credits are bought and cancelled from the following project: 1. BK Energia Itacoatiara (energy production from waste wood), Brazil
Clear (company)	• Offsets for personal CO_2 emission calculated in five areas: car, flights, home, commute, motorbike	UN certified CER credits are bought and cancelled from the following project: 1. Biomass electricity plant CAMIL Itaqui, Brazil
PURE – The Clean Planet Trust (charity)	• Donation of a chosen amount • Offsets for personal CO_2 emissions in five areas - home, appliances, (energy) savings, road, flights	UN certified CERs are bought and cancelled from the following projects: 1. Crop waste power plant in Malavalli, India 2. Hydropower station in Shimenping, China 3. Crop waste power plant in CAMIL Itaqui, Brazil 4. Renewable energy & forest preservation BK Energia Itacoatiara, Brazil 5. Wind farm in Ningxia, China 6. Hydropower plant in Aleo Manali, India 7. Wind farm in Tejona, Costa Rica 8. Wind farm in Fujian Zhangpu Liuao

Offering the consumer a choice among different CER projects or carbon reduction services provides another mechanism for seemingly 'privatizing' the service of carbon offsetting.

Thus, the clients of Carbon Footprint can select to offset their personal CO_2 emissions through either Reforestation in Kenya, VCS certified projects that support clean energy, UNEP projects in the Americas, UK tree planting or CERs. Carbon Footprint also offers real private benefits such as free site energy reduction surveys and free expert guides. Carbon Passport adopts another strategy by also selling carbon offset 'gift' sets for £10, £20, a gap year, a honeymoon, a year or an around-the-world trip, thus turning carbon offsetting into a private good that one can give to another person. In addition, it supplies a personalized or gift certificate which states the amount of CO_2 offset by the payment. That voluntary private carbon offsetting is essentially a donation to a collective good is only acknowledged by PURE, the only charity, which also provides an option for doing away with the calculations or intangible "gifts" by specifying any amount that the client would be willing to buy CERs for.

The impact of private carbon offsetting on reducing greenhouse gas emissions is difficult to assess. As Collective Goods Theory expects, the lack real private benefits to individual clients can be a problem for the growth of the carbon offset industry in this area. Corporate clients, like Body Shop, Marks & Spencer, O2 or Reed, are much more likely to offset their CO_2 emissions because aiming to be a 'carbon neutral' company has measurable private benefits such as rising share prices and sales. As The Carbon Neutral Company, a British firm specializing on corporate offsetting, writes "Managing climate change is not just good for the environment. It can deliver real commercial return".[52] It is unsurprising that corporate consumers make up 80 percent of the global market for voluntary carbon offsetting, while private individuals only account for 5 percent.[53] While private individuals have shown a considerable willingness to pay for carbon offsetting levied as taxes on flights or other products, voluntary offsetting is likely to remain a small market.

Additional questions about the impact of the private carbon offset market have been raised by the criticisms directed against the CER system.[54] One regards the question of whether the emission reductions financed by the purchase of CER from projects in developing countries are indeed 'additional'. According to Mike Childs, Head of Climate Change at Friends of the Earth, carbon offsetting derived from carbon credits is not

[52] The Carbon Neutral Company, at: http://www.carbonneutral.com/pages/businesscanbenefit.asp.
[53] Lovell et al., 'Carbon Offsetting,' p.2363.
[54] Paulsson, 'A Review of the CDM Literature', pp.66-74.

necessarily beneficial because these projects would have happened anyway.[55] The academic literature, too, has expressed increasing doubts over the additionality of CDM projects, the assessment of which is based on 120 different methodologies.[56] Another issue has been the possible negative impact of the CDM in developing countries, such as the prevention of local initiatives or the displacement of emissions to other areas.[57] Finally, the idea behind the CDM has been questioned because its focus on cheap emissions reductions in developing countries seems to prevent the necessary reorientation towards sustainable production and consumption patterns in industrialized states.[58] In sum, the potential contribution of private carbon offsets to fighting global climate change is at best very limited.

Reaching the Consumer

One of the notable observations regarding the marketing of the products and services analysed in the preceding sections is the lack of direct references to the threat of climate change. Firms offering low-emission goods and services appear to assume that citizens are already well informed about its dangers and convinced of the need to take private action through consumption choices. So the question emerges: how is the market for low-carbon products and practices created and shaped? Western government agencies and international organizations have played a key role in the securitization of climate change.[59] Their efforts are complemented by a multitude of environmental NGOs and think tanks. However, the impact of government and NGO reports on public opinion is at best indirect. Few consumers/citizens read the reports of governments and think tanks on climate change. Most information about these studies is conveyed through the media. TV programmes, advertisements and newspaper reports have arguably the broadest reach and, presumably, influence on public perception. Since the content of TV programmes and advertisements is difficult to analyse, this paper focuses on the print media, specifically the main British newspapers.

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[55] Louise Gray, 'Carbon Neutral Guidance Is 'Greenwash',' *Telegraph*, 1 October 2009. This suggestion has also been made in TV programmes such as 'Dispatches: The Great Green Smokescreen' and Cannel Four (2007), cited in Lovell et al. 'Carbon Offsetting,' p.2373.

[56] Cameron Hepburn, 'International Carbon Finance and the Clean Development Mechanism', *Smith School Working Paper Series*, 3 September 2009, p.5.

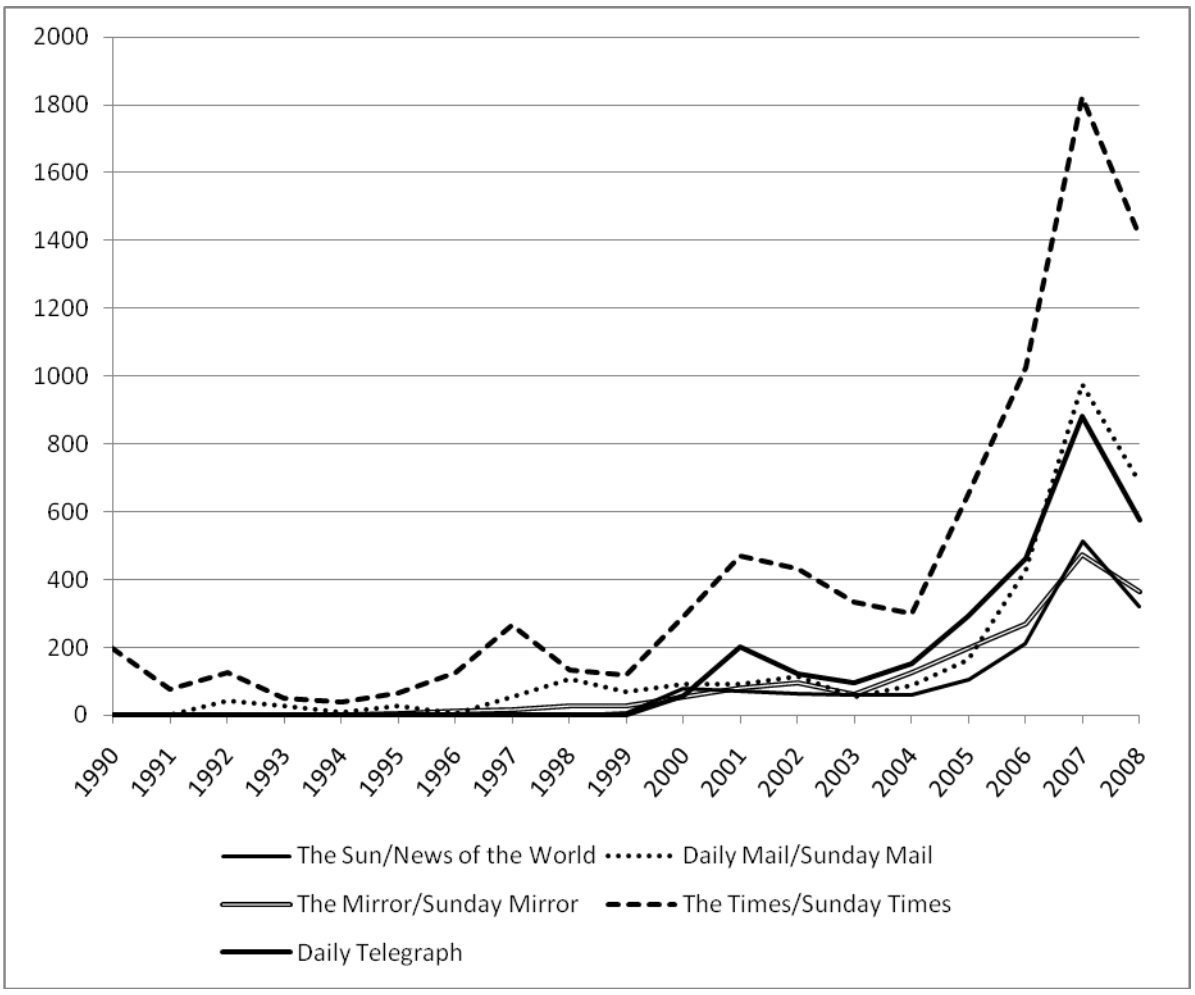
[57] Paulsson, 'A Review of the CDM Literature', pp.69-70; Hannah K. Wittman and Cynthia Caron, 'Carbon Offsets and Inequality: Social Cost and Co-Benefits in Guatemala and Sri Lanka,' *Society and Natural Resources*, 22, no. 8 (2009), pp. 722-3.

[58] Kevin Smith, *The Carbon Neutral Myth: Offset Indulgences for your Climate Sins* (Amsterdam: Carbon Trade Watch, 2007).

[59] Hans Günter Brauch, 'Securitizing Climate Change', paper presented at the 50th ISA Annual Convention, New York, 15-18 February 2009; Maria Julia Trombetta, 'Environmental Security and Climate Change: Analysing the Discourse,' *Cambridge Review of International Studies*, 21, no. 4 (2008), pp. 585-602.

A content analysis of the top five UK daily newspapers and their Sunday editions - *The Sun/News of the World*, *the Daily Mail/Mail on Sunday*, *the Daily Mirror/Sunday Mirror* and *The Times/Sunday Times* - demonstrates the growing preoccupation with climate change. Figure 1 shows how the prevalence of the phrase 'climate change' has increased exponentially in the new millennium, peaking in 2007. It also demonstrates that the issue of climate change has moved from a 'high brow' concern of broadsheets such as *The Times* into the discourse of mass papers such as *The Sun*.

Figure 1. 'Climate Change' in Top 5 UK Newspapers



Regarding the presentation of climate change in the private press, three questions are of particular interest in this paper. Firstly, how is climate change presented? Is it 'securitized' or 'de-securitized'? Is it regarded a contemporary 'threat' or a future 'risk'?[60] Is it presented as local, regional and/or global problem? Secondly, what is the relationship drawn between

[60] For the distinction between threats and risks see Elke Krahmann, 'Beck and Beyond: Selling Security in the World Risk Society,' *Review of International Studies*, 2010 forthcoming.

climate change and consumer behaviour? Is the consumer 'responsibilized' or 'de-responsibilitzed' with regard to the fight against climate change? What is the presumed impact of changes in consumer behaviour on greenhouse gas emissions? Thirdly, how are 'eco-', 'green' and 'low-carbon' products and services evaluated? Are they presented in a positive, negative or neutral light?

A detailed analysis of these questions is beyond the scope of this paper. However, a preliminary survey of articles published in *The Sun*, the newspaper with the largest circulation in the UK, in 2007 (i.e. before climate change was displaced by news of the financial crisis) suggests the following tentative conclusions. Regarding the first question of whether and how *The Sun* presents climate change, the analysis shows that the majority of articles see climate change not as a 'security' issue. Instead it views climate change primarily as an environmental problem with impacts on weather patterns in the UK and around the world, such as the frequency and severity of local floods and storms. The articles apply the consequences of these changes in the weather mainly to farming and housing, including the threat of droughts or the benefits of a warmer climate for certain crops as well as the dangers to housing built in coastal areas or river valleys. The presumed consequences can be both positive and negative. For instance, *The Sun* notes that champagne makers are "considering buying up land in Kent and Sussex" because the climate increasingly resembles that of Bordeaux thirty years ago.[61] But it also worries that whisky distilleries in Scotland are threatened by rising sea levels: "in 20 years most whisky distilleries located on the coast of Scotland could disappear. Now it really is getting serious."[62] Importantly, the newspaper presents climate change as a present danger rather than a potential and future risk. Mentions of climate change occur typically alongside statements pointing out its observable consequences in the UK or elsewhere:

> "BRITAIN faces a future of violent storms - along with higher temperatures - because of climate change, a Government report has warned. ... In fierce winds yesterday a lorry jack-knifed and overturned on the A12 at Kelvedon, Essex, and a tree crashed into a house in Crowborough, Sussex."[63]

These findings show that *The Sun* has not followed the 'securitization' of climate change, observed in government or NGO discourses. Neither does the paper suggest that climate change is merely a potential risk in an unforeseeable future. Climate change is occurring now

[61] NN, 'Corking news, UK', *The Sun*, 31 December 2007.
[62] Robin Galloway, 'Eco row is hot air', *The Sun*, 21 December 2007.
[63] Graeme Wilson, 'Wind will reign', *The Sun*, 8 December 2007.

both regionally and globally. The newspaper also presents a quite differentiated picture of the potential consequences of climate change.

Despite the recognition of the threat of climate change implicit or explicit in the publications of *The Sun*, its views on the relationship between consumer behaviour and climate change are ambiguous. On the one hand, one of the most frequent phrases in the context of environmental behaviour is the appeal to "do your bit" to save the environment, planet or earth.[64] In addition, *The Sun* celebrated its first "Green Day" on 7 July 2007. As part of the event, the paper called for readers to take one of ten different measures such as changing to energy-saving light bulbs, planting a tree, walking to school or work and changing to a green power supplier, asserting that "just a small change in your lifestyle can make a huge difference".[65] In order to illustrate this difference, the newspaper asked readers to call or text it with information about their actions so it could "predict how much carbon Sun readers have saved in just one day".[66]

In this as well as in other issues celebrities serve as key role models for environmental conscious behaviour and consumption - from the Queen who "has always been energy-conscious" to "Screen greenie - ECO-friendly Julia Roberts".[67] On its "Green Day" *The Sun* specifically asked 14 actors and actresses to give readers their advice how they could help the environment.[68] The suggestions included turning down the heating, switching off electric appliances, eating less meat and recycle. The newspaper also reported about the experiences of a family who tried to be "eco-friendly" for one week following the advice of a consultant from 3 Acorns Environmental Transformations, an environmental auditing company.[69] While the family found some of the changes difficult, such as giving up several TVs, it afterwards felt "very worthy". At the end of the week, the mother concluded:

> "I do miss my baths and takeaways though, not to mention the car and tumble dryer. But I'm determined to keep up with as many rules as I can without all-out family war! The changes we have made are quite small in the scheme of things but, if everyone did it, it would make a huge difference and don't we owe that to the next generation?"

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[64] NN, 'We made small changes that made a huge difference,' *The Sun*, 8 July 2007; Sharon Hendry, '27 days until Green day,' *The Sun*, 11 June 2007; Bronagh Curran, 'Pierce bonds with organic set,' *The Sun*, 29 April 2007; Anya Hindmarch, 'My bag makes you green and cool for a fiver,' *The Sun*, 14 March 2007; Laura Stott, 'Fairtrade,' *The Sun*, 2 March 2007; Kathryn Brooks, '27 ways to go green in 2007,' *The Sun*, 1 January 2007.
[65] Derek Brown, 'The Sun saves earth,' *The Sun*, 25 April 2007.
[66] Ibid.
[67] NN, 'Screen greenie', *The Sun*, 18 December 2007; Katherine Bergen, 'No.1 Vine Street development', *The Sun*, 18 December 2007.
[68] NN, 'Stars of Stage & Green', *The Sun*, 6 July 2007.
[69] NN, 'We made small changes that made a huge difference,' *The Sun*, 8 July 2007.

On the other hand, the number of articles referring to "eco-friendly" or "ecological" behaviour during the rest of the year was rather small. Positive references to environmentally conscious "eco-warriors" and "green goddesses" were countered in nearly equal measure by articles ridiculing those who act in such a manner as "boffins", "eco-nuts" and "eco-fascists".[70] The following commentary summarizes the typical attitude displayed in *The Sun*:

> "My neighbour has covered his roof with gleaming solar panels. Another neighbour has bought one of those hybrid cars that runs on chicken droppings. Wherever you turn, 'saving the environment' is the war cry. Yes, I do believe pollution is making matters worse, and we have a big responsibility to think of the future. But we need calm reason rather than the sort of hysteria we heard at last week's big Bali climate conference."[71]

According to *The Sun* radical changes in contemporary economic and social practices are unrealistic at best, and detrimental to employment figures and the British lifestyle at worst. "We would be back to the horse and cart, living by candlelight in huts. Feel-good gimmicks such as individual wind turbines on roofs are, alas, largely empty gestures", summarizes the general sentiment of these articles.[72] The newspaper is also critical of the role of the economy in fighting climate change. Several articles accuse businesses of preventing consumers who would be willing to reduce their CO_2 emissions from doing so by demanding unacceptable prices for 'green' products and services and by providing inferior goods. The suggestion that the origins of climate change are unclear and widely disputed further questions the need for changes in UK consumer behaviour. Thus, *The Sun* reports that "no fewer than 400 prominent scientists disputed the global warming agenda this year" and argues that "Scientists still aren't sure how much pollution is to blame for global warming."[73]

Together these arguments suggest that the primary responsibility for dealing with climate change rests with governments, in particular those of countries with the highest greenhouse gas emissions, and not the British consumer. The UK is considered only a small part of the problem. Other industrialized countries, in particular the United States, and fast developing nations such as India and China are portrayed as contributing more to greenhouse gas emissions and responsible for making changes first.[74]

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[70] Matt Bendoris, 'Mark my words: being green's cool,' *The Sun*, 13 September 2007.
[71] Fergus Shanahan, 'Take the nuclear option, Gordon', *The Sun*, 18 December 2007
[72] Ibid.
[73] Ibid.; Fraser Nelson, 'Global warming', *The Sun*, 23 December 2007.
[74] David Blunkett, 'Summit missing at Bali', *The Sun*, 19 December 2007.

The Sun's attitude towards environmentally friendly products and services themselves is also ambivalent. The key argument in favour of green products and behavioural changes relates to cost savings generated by reduced energy consumption. According to *The Sun*, low-fuel or hybrid cars "are wowing buyers everywhere because they are much cheaper to run" and save taxes.[75] In addition, ensuring that tyres are fully inflated and having one's car checked by KWIK-FIT's "Go Green - the UK's first green car service" reduces petrol bills *and* carbon emissions through increased efficiency.[76] Other cost-saving gadgets promoted by the paper include energy efficient radios and light bulbs.[77] The reduction of greenhouse gas emissions is a secondary benefit linked to the aim of helping "to save the planet". For the private consumer such action promises a "green glow inside", a "clear conscience", doing something "noble and worthy" and even being "fashionable".[78]

At the same time, *The Sun* appears to be critical of many products and services which would help cut greenhouse gas emissions. Trains and busses are considered both expensive and inefficient.[79] According to the paper, cost-saving 'green' cars are only affordable to the rich with the price for new hybrid, hydrogen or electric models ranging from £120,000 for Ford's 4x4 Edge to £1 million for the Koenigsegg CCXR.[80] Cheaper models are in preparation, will not be on the market for a few years to come. Energy-saving light bulbs can be "a deadly health risk" because they contain mercury which can pollute water if disposed of in the normal rubbish.[81] Demand for local and organic food leads to rising prices as supermarkets are attempting to lower their "food miles" and reduce the carbon footprint of their produce by cutting their cheap imports from overseas.[82] Even Sainsbury's designer "eco-bags" which attempted to make the use of jute bags fashionable led to a backlash when it became apparent that the supermarket chain shipped the items from China, "using cheap labour... - and thousands of litres of fuel".[83] In sum, *The Sun* suggests that the British consumers are not primarily responsible for fighting climate change and that eco-friendly products have at best mixed benefits while being often unaffordable to the average reader. If

[75] NN, 'Save £ £ £ with spark 'n ride,' *The Sun*, 27 November 2007.
[76] NN, 'Do not deflate bank balance,' *The Sun*, 19 October 2007; NN, 'Green machines,' *The Sun*, 26 October 2007.
[77] Trevor Davies and Emily Merritt, 'Roberts' Gemini 21,' *The News of the World*, 18 November 2007.
[78] James Foxall, 'On The Forecourt,' *The News of the World*, 16 December 2007; Phil Lanning, 'Electric dream,' *The Sun*, 5 October 2007; Kay Cox, 'Green and bear it,' *The Sun*, 27 July 2007; Kathryn Lister, 'Eco bag 'con',' *The Sun*, 28 April 2007.
[79] NN, 'So unfare,' *The Sun*, 15 November 2007.
[80] James Foxall, 'Cutting Edge,' *The News of the World*, 16 September 2007; James Foxall, 'Green black Swede's brill thrill for a mill!' *The News of the World*, 16 December 2007.
[81] NN, 'Eco bulb menace,' *The News of the World*, 6 May 2007.
[82] Michael Doyle, 'Not easy going green,' *The Sun*, 8 October 2007.
[83] Kathryn Lister, 'Eco bag 'con',' *The Sun*, 28 April 2007.

there are contributions to make, these are primarily seen in terms of making small behavioural changes which cut CO_2 emissions *and* save money such as not leaving appliances on stand-by and turning down the heating.

Conclusion

Market mechanisms, such as emissions trading, have played a key role in global efforts to combat climate change. Also the UK government has sought solutions to reducing national greenhouse gas emissions through the promotion of 'sustainable' production and consumption. Nevertheless, the private market for low carbon products and services has failed to deliver sizeable cuts in CO_2 emissions. One problem has been the so-called 30:3-syndrome. It refers to the observation that, although 30 percent of individuals favour environmental and ethical goods and services, their market share is only 3 percent.[84] Accordingly, much of research has focused on investigating the lack of consumer demand for 'green' products and services. This paper has examined the supply-side of the equation. Building on Collective Goods Theory, it has sought to explain why the role of free market supply and consumption is likely to be limited with respect to the reduction of greenhouse gas emissions. Several problems account for this failure. Firstly, private businesses find it difficult to sell a pure collective good such as fighting climate change to private consumers. Only where emissions reductions can be conjoined with excludable benefits, such as with renewable energy, appears to be a potential for its commodification. The sale of pure collective goods such as carbon offsets appeals to a very small audience, even if companies attempt to 'privatize' benefits by offering a choice among different offset projects or supplying free energy surveys. Secondly, private businesses seem reluctant to invest into new technologies for the production of low-carbon goods without government pressure. As the vehicle industry illustrates, minor technological improvements tend to be preferred over radical innovations because they are less costly. A greater potential appears to exist in areas where the government requires or supports new investments as in the case of renewable energy. Thirdly, confusing and competing labels, controversial debates between companies over their respective environmental credentials and the media discourse on 'green' consumption and products can discourage demand. Added to the complexity of the science of climate change, they increase doubts among potential customers as to the environmental benefits of allegedly 'green' products and services. It follows that the government's

[84] Hobson, 'Sustainable Consumption in the United Kingdom,' p. 130; Lane and Potter, 'The Adoption of Cleaner Vehicles in the UK'.

reluctance prescribe modifications to products with high CO_2 emissions and its belief in the possibility of 'win-win' situations for business and the environment are based on a lack of understanding of the conditions for effective commodification.

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