

**The Environment, Food and Rural Affairs Committee
Climate change: citizen's agenda**

Memorandum by the Royal Society of Chemistry

The Royal Society of Chemistry (RSC) welcomes the opportunity to comment on “The Environment, Food and Rural Affairs Committee Climate change: citizen's agenda” inquiry.

The RSC is the largest organisation in Europe for advancing the chemical sciences. Supported by a network of 43,000 members worldwide and an internationally acclaimed publishing business, our activities span education and training, conferences and science policy, and the promotion of the chemical sciences to the public.

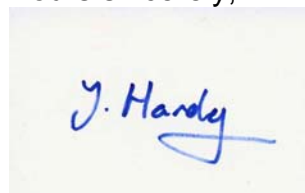
This document represents the views of the RSC. The RSC's Royal Charter obliges it to serve the public interest by acting in an independent advisory capacity, and the RSC is happy for this submission to be put into the public domain.

The document has been written from the perspective of the Royal Society of Chemistry and consequently our comments relate to only parts of the consultation document.

The evidence submitted was for the most part published in an RSC report¹ entitled “Chemical Science Priorities for Sustainable Energy Solutions” and the RSC responses to the DTI energy review², the EAC inquiry into Reducing Carbon Emissions from Transport, the EAC inquiry into Climate Change – The UK Programme and the joint RSC and Bioscience Federation response to the EFRA inquiry into Climate change: the role of bioenergy.

If you would like further information or need anything in this document clarified, please do not hesitate to contact me.

Yours sincerely,

A rectangular box containing a handwritten signature in blue ink that reads "J. Hardy".

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¹ www.rsc.org/Gateway/Subject/EnvEnergy/

² www.rsc.org/policy

Executive summary

1. A combination of energy efficiency measures and low carbon technologies will need to be employed in order to reduce the UK carbon emissions.
2. The chemical sciences will play a critical role in the development of technologies that will reduce carbon emissions from domestic living, especially those that reducing heat loss in the home, efficient lighting and efficient transportation options.
3. Citizens can contribute to reducing UK carbons emission through their use of technologies and lifestyle changes that affect the home and personal transport choices.
4. Government must put in place a framework of incentives, regulation, education and demonstration and all of these must be at an appropriate level to inspire action. Ideally there should be cross-party consensus on this framework.
5. Government must be prepared to lead by example and demonstrate energy efficiency measures and technologies in Government buildings and in the vehicle fleet. Such demonstrations will be invaluable in educating citizens about the viability and economics of energy efficient measures and technologies.
6. Learned bodies such as the RSC have a key role to play in providing expert, unbiased advice on technologies and measures to reduce carbon emissions to Government and other key stakeholders. There is also an important role in educating organisation members and the general public about the science behind climate change and the measures required to mitigate it.

Introduction

Technology has in the past and will in the future have a major impact on reducing UK carbon emissions, however, individual and community actions to reduce carbon emissions are critical if we are to address climate change. Dangerous impacts of climate change will only be mitigated if we maximise the use of all the tools available.

In its submission to the EAC inquiry on the climate change programme the RSC made a number of points relevant to this inquiry.³

A huge amount of energy is wasted in generation, transmission and at final use. Significant public and/or private investment in energy efficiency is vital because:

- The Government will fall short of its target of 20% carbon emission reduction by 2010.
- The UK government will not meet the carbon emissions reduction target of 60% by the year 2050 without huge improvements in energy efficiency.
- It has been calculated that 20% of energy could be saved cost-effectively by investing in energy conservation. This would yield savings of over £10 billion a year; money that would boost the economy when spent on other goods and services.
- There are significant social benefits of investment in energy conservation include creating significant numbers of jobs in energy-related services such as manufacturing and installation of energy saving equipment. Moreover, homes and workplaces would be made easier and cheaper to heat, greatly improving standards of living and comfort.

Good leadership and adequate support from Government will ensure that the chemical sciences have a leading role in improving efficiency in the generation, transmission and use of energy.

For the **transport sector** the RSC encourages the uptake of biofuels through the Renewable Transport Fuel Obligation. However, when considering biofuels it is important that they are produced efficiently otherwise the benefits of reduced carbon emissions can be eroded. In particular the RSC is concerned that the recent DTI report *the energy challenge*⁴ indicated an increase in the Renewable Transport Fuel Obligation that would place it at level where UK would be forced to import fuels as they could not be produced locally. The energy balance of a fuel (i.e. how much energy is required to produce it and transport it compared to the energy it produces on combustion) can be adversely affected by transport over great distances. This point is equally valid when describing the impact of transporting food (i.e. food miles) over large distances. A move towards vehicles with greater fuel efficiency through the use of lighter materials of construction, advanced fuel additives, increased engine efficiency, the use of advanced technologies such as hybrid

³ www.rsc.org/policy

⁴ <http://www.dti.gov.uk/energy/review/>

and electric vehicles and those with fuel cells should be encouraged both through support for technology development and through policy that offers incentives for using such vehicles. Carbon emissions from air travel are expected to increase substantially in the medium term, and whilst technology can reduce the emissions per flight, it is much more important to reduce the overall number of flights.

The **domestic sector** offers a huge opportunity and a challenge for reducing carbon emissions. The RSC is encouraged that the Climate Change Programme includes measures for much needed energy efficiency improvements to domestic buildings and building regulations. Domestic energy efficiency measures can play a significant part in meeting UK carbon reduction targets. The RSC is concerned that the measures proposed do not adequately address energy efficiency in older buildings and that this is a missed opportunity. Smart coatings on glass and highly efficient insulation materials could dramatically reduce heat loss in all buildings saving money and reducing carbon emissions. With sufficient support, scientists and engineers will continue to develop products and services that are energy efficient.

It is critical that low carbon technologies that are available now, and that will be available in the future, are widely employed by individuals and by communities. The RSC recommends that a framework of regulation and incentives is put in place by Government nationally, regionally and locally that demands and encourages the application of low carbon technologies and also energy efficiency in domestic life and in communities. It is absolutely crucial that this is complimented by an educational campaign that both informs and motivates individuals and organisations to take positive and appropriate action.

The RSC is encouraged that *the energy challenge* proposes that inefficient technologies such as incandescent light bulbs, standby modes on electrical goods and inefficient white goods are to be phased out. To maximise the impact of these measures they must be carried out alongside a targeted programme of education and demonstration.

Encouraging public action

The RSC suggests that timescales for the impact of global warming are perceived as too far in the future and that people cannot associate today's individual actions with their impact on future climate change scenarios. This is a huge challenge to overcome as action is required now in order to reduce the impact of climate change.

To encourage individuals to "do their bit" towards minimising the impact of climate change will require a framework of incentives, regulation, education and demonstration and all of these must be at an appropriate level to inspire action.

Regulation and incentives

The RSC recognises that regulation forcing the public towards a change in lifestyle (for example regulation that demands a minimum standard of insulation in every home in the UK) is unlikely to be a vote winner. The RSC suggests that such legislation and regulation be brought in on the back of a cross-party agreement that demonstrates consensus of all major parties to the measures in the long-term. Equally such measures should be backed with an incentive, education and demonstration scheme at the appropriate level that clearly demonstrates the benefits and assistance of the measures.

Education and demonstration

Currently a significant level of misinformation and media hysteria surrounds the impact of climate change and the strategies for its mitigation. The role of Government is to inform the public about climate change and clearly detail the UK strategy to address it.

In the **public sector** the Government must lead by example and **demonstrate** significant carbon emission reduction in both its buildings and its vehicle fleet. Such a scheme would increase stakeholder confidence in carbon emission measures and technologies and provide valuable data on high impact programmes and technologies.

In a broader sense Government must also lead the way in planning and constructing new buildings and public services that, as well as having low carbon emissions, are located to minimise the need for both employees and customers to travel and to optimise the use of efficient public transport.

A wider point here is that demonstration projects and educational initiatives must be linked together as this will provide an essential means of reinforcing educational messages. Here the RSC recommends that demonstration projects are developed at the local, regional and national level and that these projects have an educational aspect associated with them. It is critical that demonstration projects span all aspects of society including homes, schools, universities, business, public buildings, transport and Government and that the technologies employed are appropriate to the situation. Through such projects it will be possible to demonstrate, gather data and inform the public on a number of key technologies including:

- Smart meters (helping to demonstrate the effect of lifestyle and technology on energy usage)
- Energy efficient buildings (insulation, smart windows and natural ventilation systems)
- Energy generating buildings (see the energy generating home below)
- Low carbon transport (walking, cycling, improved public transport, lighter fuel efficient vehicles, smart fuel additives, biofuels, hybrid vehicles and fuel cell vehicles)

As an example, the RSC is a partner in the European platform for sustainable chemistry (SusChem); one of the initiatives of this project is the **energy generating home**⁵ (see Figure 1). In this project ground-breaking technologies and smart materials will make this vision possible by reducing heat loss, improving energy efficiency and absorbing and transforming energy into electricity. This project aims to demonstrate a mixture of present and future energy technologies and has an interactive control system that provides real-time information on the status of the property. By a combination of smart windows and insulation materials, micro-energy generating technologies and intelligent control systems this project will demonstrate that a house can actually generate electricity for sale to the national grid.

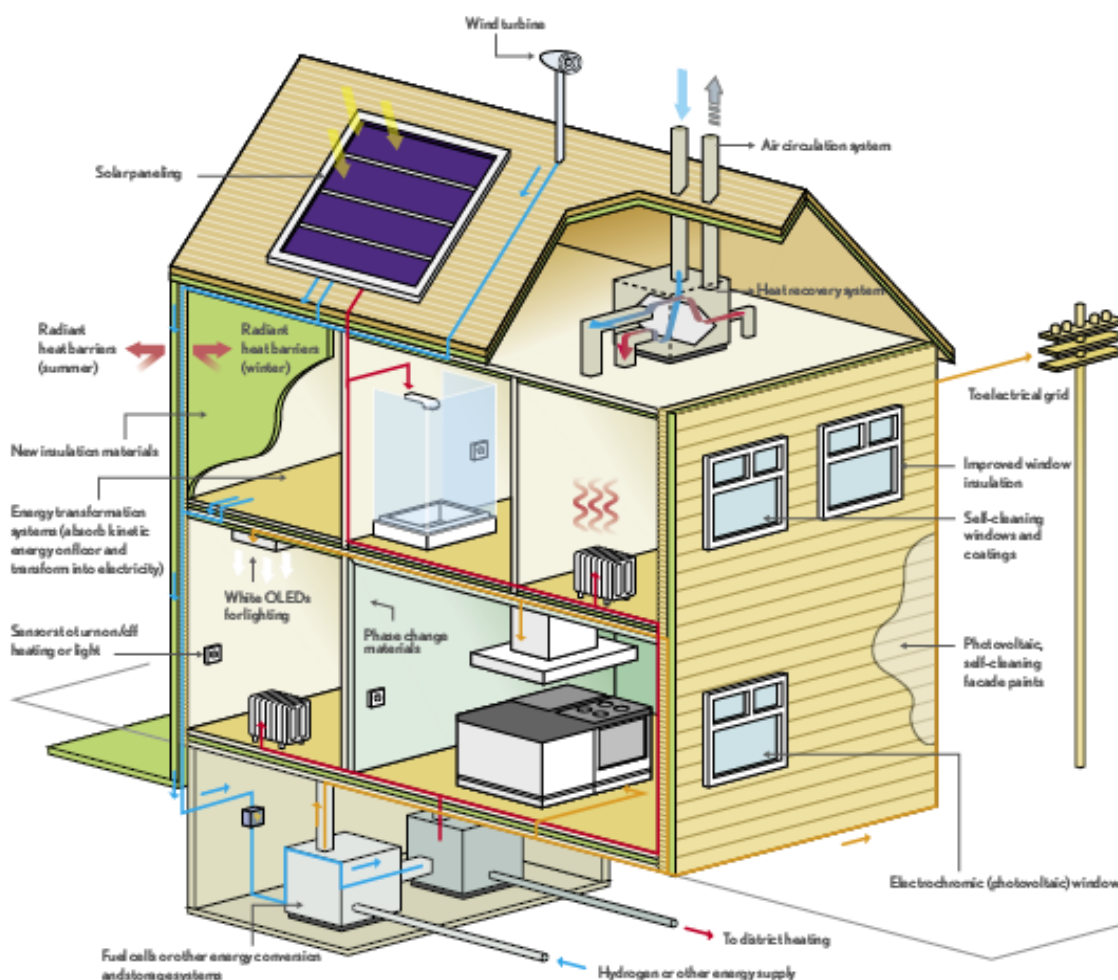


Figure 1: SusChem energy generating house

The role of the RSC and other learned bodies

At the RSC our Royal Charter demands that we serve the public interest by acting in an advisory, consultative or representative capacity in matters

⁵ www.suschem.org

relating to the science and practice of chemistry⁶. The RSC actually has a number of roles in delivering the citizen's climate change agenda, including:

- Education
- Unbiased scientific advice to Government and to the public
- Technology assessment
- Technology foresight
- Expert members available for comment

Through its expert members the RSC can provide authoritative information on current and future low carbon technologies and the impact of climate change and how to mitigate it. The RSC published an authoritative report on *chemical science priorities for sustainable energy solutions* in 2005 and has responded to a number of Government consultations in related areas including our response to *Our Energy Challenge*⁷. Currently an expert working group is compiling a report on *chemical science priorities for sustainable water* that will include details on water and energy efficiency in the household and the effect of climate change upon UK water resources.

Tradable domestic quotas

The RSC does not have an official position on tradable domestic quotas, however, the RSC does recognise that this concept offers a clear mechanism for individual contribution to climate change abatement.

The RSC is concerned that reducing carbon emissions is not cost neutral and that if incentives are not in place then only those that can afford to implement low carbon measures will do so (for example consider the cost of wind turbines and solar panels). This could result in a situation where those who are most able to afford to implement such measures are likely to be those who have credits to sell. Conversely, those who are most likely to struggle to meet the cost of improvements are also those who are most likely to need to buy credits.

In addition to the concern about cost the RSC also is aware that in order to implement domestic tradable quotas it will be necessary to inform the public to a far greater extent the link between domestic living and climate change. This must include a clear presentation of the facts that will prepare the public for the changes in lifestyle required, such as:

- The likely impact of climate change, the associated dangers and the cost of inaction
- Extent of reductions required
- How this will affect lifestyle
- Fact that regulation may be required
- Timescale over which these changes will need to be implemented

⁶ <http://www.rsc.org/AboutUs/Governance/charter.asp>

⁷ www.rsc.org/policy

