Tackling Climate Change

Why Demand Side Measures Supply Truly Cost-effective Solutions

Overview

Europe – facing a new set of challenges

Europe faces a very different set of challenges now than it did at its creation fifty years ago. For much of the last fifty years, Europe's political leaders were focused on delivering peace and prosperity. Now Europe must face a new threat to prosperity and to peace – climate change.

Importantly, the need to act has been recognised; on the 9th March 2007, Europe's Heads of State committed Europe to a greenhouse gas emission reduction target of 30% by 2020 (conditional on other developed countries agreeing similar targets). In addition, Heads of State committed, irrespective of the action of other nations, to a binding and unilateral target of a 20% cut by 2020.

Unfortunately, to meet these targets, commitments need to be delivered in practice and therefore must improve Europe's competitiveness rather than harm it. Fortunately, the CEPS/ECN study demonstrates that energy efficiency in buildings can deliver climate and energy security, whilst also improving competitiveness. Moreover, it demonstrates that energy efficiency in buildings is the only measure that is at once cost-effective, based on existing and proven technologies whilst not demanding a trade-off against other risks.

Managing energy demand in buildings – the best way to deliver in practice

The case for the cost-effectiveness of energy efficiency measures, particularly within the building sector, has been clear for some time. At recent peak energy price levels, improving the energy efficiency of Europe's building stock would save the EU 270 billion euro a year in energy costs. These improvements would also reduce carbon dioxide emissions by 460 million tonnes a year (more than Europe's total Kyoto commitment) and reduce energy use by the equivalent of 3.3 million barrels of oil a day.

However, the wider competitiveness impacts of these improvements, on for example improved energy security, reduced air pollution, job creation and poverty alleviation have not been as clear. It is for this reason that the European Insulation Platform (EIP), commissioned the Centre for European Policy Studies (CEPS), to analyse the wider competitiveness effects of different solutions to deliver climate change objectives. This leaflet explains how this was done, the conclusions of the study and what this means for Europe's policy on climate and energy security.

The CEPS/ECN Study – a proposal for a broader approach

At the global and at the European level, one of the main considerations for choosing polices to tackle climate change has been cost-effectiveness, i.e. the number of euros per tonne of carbon dioxide saved. With climate change measures having an important impact on other policy areas such as, security of energy supply, air quality and competitiveness, it is important to ensure these impacts are taken into account. If not, the real impact on competitiveness is not properly understood and policy decisions might not be in line with the political objective of delivering all of these different goals.

The study undertaken by CEPS together with ECN therefore analysed the wider costs and benefits of climate change mitigation measures. By including the co-benefits of climate change measures on air quality and energy security of supply, it has proposed a method for including these benefits within a cost-effectiveness analysis. In addition, the study considered the impact of measures on jobs so as to also include this within the broader analysis.

The CEPS/ECN Study – a reviewed approach puts energy efficiency in buildings at the top of the list

The study demonstrates that to achieve climate change objectives, whilst supporting other policy goals, Europe will need to focus policy more on energy demand management measures and the development of energy technologies. Both these stress the need for European Union competencies in the field of energy and a partnership approach with business.

Domestically it will be of crucial importance that the European Union achieves greenhouse gas reductions across all sectors but notably in buildings and transport. The study indicates that energy efficiency in buildings is the best way to deliver climate and energy security, whilst also improving competitiveness and should therefore be at the forefront of policy measures.

Key Findings

Developing a new approach – it is possible

In terms of developing a wider cost-effectiveness analysis, the study concludes that it is possible to integrate both air quality and energy security of supply benefits into a cost-effectiveness modelling. Other benefits such as employment were not so easily included. Certain, disadvantages, such as the potential nuclear accidents, were also not easily monetised. The study suggests that these factors need to be left to the appreciation of policy makers.

A reanalyse of priorities – the priorities change

From the social cost-benefit analysis of specific measures **five options** stood out as having the best cost benefit ratio, when taking into account the quantifiable externalities:

1. **Insulation** comes out as the best measure in terms of the social cost-benefit analysis. It is a very cost-effective option from the end-user point of view in reducing the emissions of GHGs and has ancillary benefits for energy security and air quality, as well as job creation. In addition, it improves issues such as fuel poverty, which although difficult to monetise brings real benefits to individuals.

2. **Integrated gasification combined cycle (IGCC)** power plants have medium costs but contribute significantly to the long-term goal of applying Carbon Capture and Storage (CCS) in these and other coal-fired plants.

3. **Bio fuels** for transportation have medium to high implementation costs and high benefits for energy security; there may be scale limitations.

4. **The cost of combined heat and power (CHP)** is assessed to be low (but with a high level of uncertainty) while having both a large potential to reduce emissions of GHGs and medium ancillary energy supply security and air pollution benefits.

5. **Nuclear power** appears to be cost-effective and has significant benefits regarding avoided air pollution and energy supply security. Its suitability needs to be assessed based on political acceptability and proliferation risks. Costs, such as the final storage of used fuel and the risk of accidents need to be included.

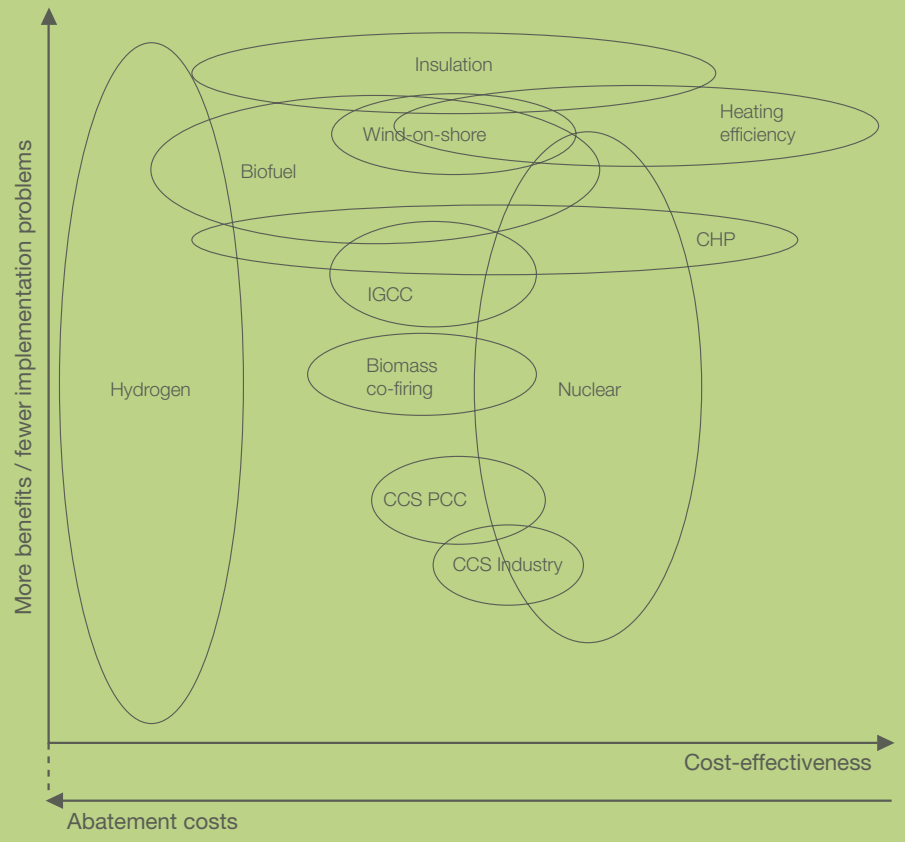
Relating the Technologies to Carbon Dioxide Reductions

It is estimated that to maintain global carbon dioxide levels in the atmosphere below 550 ppm, 6-7 billion tonnes of carbon (22-25 billion tonnes of carbon dioxide) will need to be saved annually by 2050, versus business as usual. The table below indicates how, much, of each of the 8 options is needed in order to save 1 billion tonnes of carbon (3.7 billion tonnes of carbon dixiode).

Of the options in Table A, energy efficiency in buildings is currently the only option that fulfils three key criteria: it is cost-effective, available with current technology and is based on simple technology that does not demand trade-offs against other risks.

Graph A provides an analysis of the cost-effectiveness of different climate solutions as well as the benefits they deliver to society and the ease of delivering them. As can be seen, insulation comes out as highly cost-effective whilst providing the most societal benefits of the different options. Unlike certain options insulation is also shown to be easy to implement and without trade-offs against other risks.

Climate Solutions - A cost effective analysis



Graph A

Technology	Required for 1 bn T reduction of carbon (3.7 bn T of carbon dioxide)
Measures related to energy consumption in existing building stock (heat installation, insulation, appliances, etc.)	9 times the present Energy Performance in Buildings Directive for EU-15 if extended to all houses (hypothetical global application)
Nuclear power plants replace average plant	1500 x 1 GW (5 x current)
Wind power replaces average plant	150 x current
Solar PV displace average plant	5 x 1 million (2000x current)
Hydrogen fuel	1 billion H2 cars (CO2-free H2) displacing 1 billion conventional 30 mpg (approx. 8 litres per 100 kms) cars
Geological storage of CO2	Inject 100 mb/d fluid at reservoir conditions
Biomass fuels from plantations	100 x 1 million ha (half of US agricultural area)

Table A

Behind the Figures

Externalities – what was included

In reaching its conclusions, the study had to consider a number of externalities and co-benefits. In the final report the following conclusions were reached:

Air Pollution: Quantification of externalities of air pollution was based on literature approaches and it was possible to include this in the cost-effectiveness analysis.

Security of Energy Supply: Due to a lack of existing approaches a novel "risk premium" approach is suggested and used for measuring impacts on the energy security of supply risk. A novel approach is used for including security of energy supply in the calculations. Issues such as the impact on the European economy of price volatility as well as the military expenditure needed to secure long-term access to oil and gas, made a case for the need to include such benefits of climate policy into the analysis.

Other externalities: Areas such as damages and employment are discussed although the effects are not included in the cost-benefit calculations because of the difficulties in quantifying them in a meaningful way.

Classic cost-effectiveness analysis – problems identified

Short-term cost-effectiveness of greenhouse gas reduction options, (i.e. €/tCO2 avoided), without due regard for long-term social costs and benefits appears to be the single-most important criterion for policy-makers in designing emission reduction programmes. The study has shown that the application of this criterion for prioritising climate change mitigation options is problematic due to:

- widely diverging and inconsistent practices in cost-benefit analysis (CBA), the scarcity of data and large cost uncertainties;
- its disregard for many long-term social costs and benefits in which quantification problems constitute but one underlying factor;
- key factors such as discount rates and the high volatility of energy price trajectories (i.e. the fact that energy prices might increase more significantly over the next 50 years than was used for analysis) are not accounted for properly and may lead to underestimation of the longer-term cost-effectiveness of certain options.

Recommendations

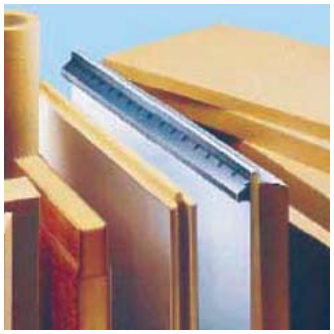
Climate Change Policy – time for a review

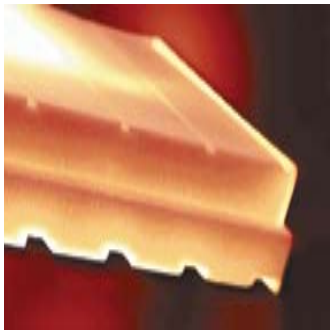
Given that a wider and more sustainable cost-effectiveness analysis provides different priorities for mitigating climate change, Europe needs to review its policy priorities. Such a review is needed to ensure that Europe's approach reflects the true societal costs that are being paid and delivers a competitive Europe. Such a review is needed to deliver in practice on the Commitments made by Heads of State to reduce greenhouse gas emissions by 20% by 2020.

The report in particular delivers a clear message that demand side measures, in particular insulation in buildings, is key to delivering climate and energy security. However, this now needs to be moved forward.







Four Policies to Deliver Climate Security through Buildings

The European Insulation Platform (EIP) brings together the leading trade associations representing different insulation materials. This report clarifies the need to focus on energy efficiency. The following four actions suggest four concrete steps that can be taken right now, to put us on the road towards energy and climate stability.

Action 1 – Implement with Ambition Current Legislation:

The Energy Performance of Buildings Directive (EPBD) and the Energy End-Use and Energy Services Directive (ESD) have a huge potential to deliver major improvements if ambitiously implemented with ambition by national governments. Europe's Member States should go well beyond the 1% annual energy efficiency target as part of their national action plans under the ESD and extend the EPBD to cover all existing buildings in terms of renovation requirements.

Action 2 - Lead by Example in Public Buildings:

Public procurement accounts for 16% of Europe's GDP. One step to seize the energy efficiency potential in these buildings would be for major cities to take a lead. The Covenant of Majors initiative proposed by the EU's Energy Efficiency Action Plan should take this as one of the key areas for action.

Action 3 – Focus on the Money but Help Don't Tell:

All the evidence points to a lack of upfront finance and the lack of technical support for renovations as being key barriers preventing a transformation of the existing residential building stock. Member States must put in place upfront financing mechanisms (e.g. low interest loans) and must go beyond telling people of the benefits of renovation but rather create real technical support schemes to help people to overcome the various barriers to upgrading the energy efficiency of their property.

Action 4 - Adopt a Clear Strategy for Passive Houses:

Buildings that use almost no energy can be built today at a cost which over the life-time of a typical loan will lead to a cost saving for the purchaser. The EU therefore needs to work with all Member States to put in place a strategy to ensure that all new build is passive by 2015. The technology exists, the know-how exists, all that is needed is a public-private partnership to deliver it.

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exiba the european XPS association

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BING
represents the interests of rigid polyurethane insulation Industry in Europe

EURIMA
represents the interests of all major mineral wool (glass and stone wool) producers in Europe

EUMEPS
represents the expanded polystyrene (EPS), plastic foam insulation Industry in Europe

EXIBA
represents the extruded polystyrene (XPS) insulation Industry in Europe

06/2007 design: Morris & Chapman