



European  
Research Area

# EUROPEAN POLICY BRIEF



**GILDED:** Governance, Infrastructure, Lifestyle  
Dynamics and Energy Demand: European Post-Carbon  
Communities

Ongoing project: Policy Brief 4

## SUMMARY

### Objectives of the research

Findings from the GILDED project have been used to generate policy advice for those developing EU level policy directives in relation to reducing household greenhouse gas (GHG) emissions (primarily CO<sub>2</sub>). Policy implications are identified and advice provided on mechanisms appropriate to accommodating these.

### Scientific approach / methodology

This document draws upon the key findings from the GILDED project to inform policy-making in relation to reducing household greenhouse gas (GHG) emissions (primarily CO<sub>2</sub>). In order to do so, it refers to findings from research on both household behaviours and regional governance structures and policy implementation in relation to GHG emission reduction. It draws upon outputs from 4 work-packages, three of which carried out research across five case study areas in Europe (in the UK, the Czech Republic, the Netherlands, Germany and Hungary). The work-packages looked at regional governance, household behavioural responses to a GHG reduction initiative, perceptions and beliefs surrounding climate change and environmental issues; in addition, the Scottish team developed an agent-based model to explore the consequences of different behaviour change drivers.

### New knowledge and/or European added value

This research identifies individual and perceived institutional characteristics related to energy consumption. We found that household values, and beliefs about the environmental



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**Key messages for  
policy-makers,  
businesses,  
trade unions and  
civil society actors**

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consequences of energy use, are indeed related to how much a household uses. We also found that the seriousness of climate change is broadly accepted, but with some national differences, and that there is a considerable degree of cynicism about human behaviour and modern society, making many people consider that reducing demand would require regulation, price increases, and technical change. Environmental NGOs are seen as the most effective institutions in regard to energy demand reduction.

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The seriousness of climate change is broadly (but not universally) accepted; scepticism about individual or household-level changes in behaviour to save energy, however, is widespread, leading many to say that regulation, price increases and technical innovation will be required to reduce energy demand. Developing more energy-efficient technologies and switching to renewable energy sources are the most favoured approaches. Household energy demand is influenced by economic factors, but also by goals and values: altruistic and pro-environmental values do appear to correlate with acceptance that energy use has undesirable environmental consequences, and with lower household energy demand, so policymakers and civil society actors should focus on these environmental consequences as well as cost savings. Among a range of institutions, environmental NGOs and other third sector actors are the most trusted, and considered key to implementing significant emission reductions, and this is emphasised by their value when facilitating effective partnerships between policymakers and other civil society actors.

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## Objectives of the research

GILDED is a 41 month collaborative research project running from December 2008- April 2012 funded by the European Union's Framework 7 Programme. The overall goal of GILDED is to identify socio-economic, cultural and political changes that could bring about a reduction in carbon-intensive energy demand from the household sector, in both urban and rural communities across the EU.

The focus of the project is household consumption, the cause of approximately 35% of all primary energy use and 40% of all greenhouse gas emissions in Europe. While technological innovations can reduce the energy requirements of specific activities, society will still need to choose to consume less. Consequently this project has sought to improve our understanding of household behaviours in relation to energy use and climate change, with the aim of enabling better targeted policy and therefore more successful outcomes i.e. significantly reduced greenhouse gas emissions.

## Scientific approach / Methodology

GILDED has taken a mixed-methods approach, combining qualitative and quantitative techniques. Research included stakeholder interviews, postal surveys, literature reviews, agent-based modelling and theoretical development. The project made use of five case studies each consisting of a city and rural environs.

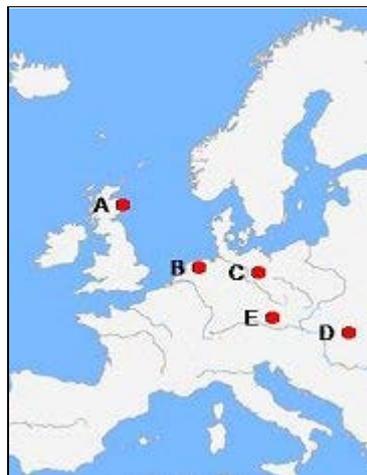
More precisely we:

- analysed the structural factors (governance, power relations, physical infrastructure) shaping current and recent energy demand and use within the household sector;
- analysed lifestyle patterns and characteristics across and within case study areas, and in parts of each country contrasting with the case study areas;
- sought to identify the socio-economic, cultural and political factors and actors that facilitate or obstruct GHG reduction within both urban and rural households;
- Modelled household responses to socio-economic incentives and neighbours' behaviour changes.

It should be noted that the research findings are not based on representative population surveys but are nevertheless

indicative of a range of views across the five regions studied, and these regions are similar in terms of urban/rural demographics.

**Figure 1: The five GILDED study areas**



**GILDED study areas**

A. Aberdeen, Aberdeenshire, Edinburgh (Scotland, UK)

B. Assen, Assen Municipality, Amsterdam (the Netherlands)

C. Potsdam, Potsdam-Mittelmark Kassel (Germany)

D. Debrecen and Hajdū-Bihar (Hungary)

E. České Budějovice, Budějoviceshire, Prague (the Czech Republic)

**New knowledge and European added value**

***European Policy Context***

The EU has set itself the goal of being the world leader in the development of a sustainable, competitive and secure supply of renewable energy for its citizens. The aim is to establish a 'post-carbon' society, where greenhouse gas emissions are dramatically reduced. However, to date technology has received far more research attention than socio-economic, cultural and political factors, and energy supply far more than energy demand in relation to this goal.

The EU is now moving on from the Lisbon Treaty's 'Sustainable Growth' objectives, and its Horizon 2020 strategy talks of enabling a knowledge economy, increased use of sustainable energy, development of efficient technology and addressing the increasing inequality within and between countries. The EU's structural funds are being re-designed to be more flexible and able to support these objectives.

Most studies on factors influencing household energy use date

back to the 1970s and 1980s, when energy conservation was promoted to avoid depletion of energy sources. Current studies have a focus on CO<sub>2</sub> emissions and global warming and these new studies also reflect the changes in culture, technology and government policies in the past few decades. It is important to take such issues into account when developing and implementing policies aimed to reduce carbon energy use. There is very little research on household level energy consumption and lifestyle choices. Most studies ask individuals about their energy use and values, and then average or group these to represent the whole population. The problem with this is that people tend to make decisions as part of a household or family group, and with some reference to their peers (friends, family, co-workers etc.). While difficult, it is also important, to look at decision-making and energy consumption at the household and social group levels in order to develop effective policies and implementation processes.

Different countries in the EU have different cultures, laws, service infrastructures (e.g. options for heating, transportation and food) and climates. It is therefore relevant to link and coordinate research across countries to identify which policies might work best overall, and where more specific approaches might be required. There also may be important differences between previously Soviet-influenced and capitalist European economies. This explains why GILDED was undertaken in Western Europe (the UK and the Netherlands), Eastern Europe (the Czech Republic and Hungary) and in former East Germany, which has aspects of both.

A key driver of EU CO<sub>2</sub> emissions policy following Kyoto 1997 (UNFCCC) is the EU-15 (pre-2004 EU Member States) joint emission reduction target of 8% below 1990 levels. An internal agreement means that some EU Member States are permitted increases in emissions, while others must decrease them. The majority of Member States that joined the EU after 1 May 2004 have targets of -6% to -8% from their base year (usually 1990). In order to achieve these targets most European countries have developed national policies aimed at reducing emissions including:

- increased use of renewable energy (wind, solar, biomass) and combined heat and power installations;
- improved energy efficiency in buildings, industry,

household appliances;

- reduction of CO<sub>2</sub> emissions from new passenger cars;
- abatement measures in the manufacturing industry;
- measures to reduce emissions from landfills.

In 2009, EU members adopted a climate and energy package to implement the 20-20-20 targets endorsed by EU leaders in 2007. These targets stated that there should be a 20% reduction of GHG emissions compared with 1990, a 20% share of renewables in EU energy consumption, and energy efficiency improvements of 20% by the year 2020.

The Directive on Energy End-use Efficiency and Energy Services that requires member states to draw up national action plans to achieve 1 percent annual energy savings between 2008 and 2017. The plans cover retail, supply and distribution of electricity, natural gas, urban heating, and other energy products including transport fuels. National action plans must be submitted to the European Commission for approval and will be reviewed every three years. Currently, the sum of member state action plans will only achieve 9% reduction by 2017. It can therefore be seen that new action plans are required if the 2020 non-binding agreement is to be achieved.

Of the four pieces of legislation key to these objectives, one is directly relevant to GILDED:

- “An "Effort Sharing Decision" for emissions from sectors not covered by the EU Emission Trading Scheme (ETS), e.g. transport, housing, agriculture and waste. Each Member State will have to achieve a binding national emissions limitation target for 2020. Overall, these national targets will cut the EU's emissions from the non-ETS sectors by 10% by 2020 compared with 2005 levels.”

It is important to note that the different political and economic status of EU nations is currently being exacerbated due to certain countries adopting austerity packages which inhibit their ability to act effectively on EU Climate Change related policy.

***Government and governance***

Combinations of strengths and weaknesses are present in each of the energy-governance models exhibited in our pan-European case studies, and no single one should be singled out as an ideal. EU directives need to continue to encourage the development of governance methods appropriate to engaging societal change, balancing civil-association activity with local government planning legislation and regulation.

Viable sources of alternative energy are present in all our case study areas and presumably in most if not all EU regions: they should be promoted alongside the means for individuals and communities to access and benefit from such developments. Policies should enable implementation in cooperation with local businesses and communities which are key to initiating local engagement. Legislation at the national level needs to provide both incentives and regulation if local government, agencies and individuals are to affect widespread, meaningful change.

Regional level governments have been exposed to significant developments in the past ten years including the rolling-out of renewable energy technology, responsibilities for improving resource efficiency, and engaging with the public in implementing policy locally. EU Directives need to assist local authorities in continuing to make adjustments in response to external drivers like these by providing clear strategies to aid policy implementation.

Exogenous factors might provide opportunities for such change, including the combination of the global recession and fuel price rises, given the finding that households believe that this will drive behavioural change in relation to energy efficiency. Another common view among both stakeholders and citizens is that information and advice needs to be clear, consistent, and linked to feedback on the impact that the collective action is making. This information needs to relate primarily to saving energy, a more tangible goal for citizens than mitigating climate change.

***Leadership and partnership***

Housing standards, transportation and food policies are typically set at national or regional levels and then implemented by local

authorities. However the study provides evidence that individuals show a widespread preference for a lead to be taken by government (at EU, National and local levels) in reducing GHG emissions. Government at multiple levels needs to demonstrate best practice by allowing public bodies and stakeholder partnerships to demonstrate the benefits of emissions reduction across sectors such as infrastructure, transport and energy planning.

EU policy must enable national governments and industry leaders to implement tangible GHG reduction practices alongside policies focused on household consumption in order to engender a sense of shared responsibility for action. Policymakers and local authorities should draw attention to those business role models which can demonstrate continued profits either despite, or as a result of, reducing GHG emissions. Policy incentives that encourage business leadership are required to build public acceptance of the need to adopt more carbon efficient lifestyles. Indeed, in environments where public funding might be increasingly scarce, such policies may be the main drivers for achieving the overall policy goals of GHG emission reduction.

In all the case study areas new stakeholders who mediate between individuals and their communities and regional authorities were recognised as key to building the partnerships and networks necessary for coordinated policy implementation. Such third sector actors (NGOs, community development groups etc.), can be powerful stakeholders because they mediate between households and those implementing policy at different levels and therefore have considerable leverage on the degree to which policies can influence household behaviour in relation to CO<sub>2</sub> emissions. Therefore public and private bodies need to continue efforts to engage in network building, showcasing examples of good practice, and these should improve the transmission of information and skills. This includes identification of local stakeholders who may become drivers of energy saving and awareness raising, and whose economic interests and moral commitments are associated with energy saving and use of renewable sources. The diversity of funding sources available can result in confusion, administrative delays and disappointments on behalf of keen stakeholders: funding needs to be streamlined at national levels. Indeed, those

responsible for implementing policies at a local level stated a desire for closer, more direct links to the EU in terms of funding.

### ***Climate change perceptions and changing behaviours***

The science relating to anthropogenic climate change is becoming increasingly well understood, as evidenced by recent IPCC reports and related research. However, this is not necessarily reflected in people's beliefs and behaviours. Climate change perceptions were correlated with energy consumption behaviour in the case study areas in the Netherlands and Germany, but less so in Scotland, the Czech Republic and Hungary. This implies that awareness campaigns based on climate change will be more effective tools for changing behaviour in the Netherlands and Germany.

Those who do not accept anthropogenic climate change will not be persuaded by scientific or technical arguments for reducing their fossil fuel derived energy use and subsequent GHG emissions. Therefore there is a need to set GHG reduction policies that aim to change public behaviour in the context of more tangible environmental issues, in particular, increased energy efficiency to counter rising fuel costs. Climate change itself is only going to provide a persuasive argument for individuals who already accept the science supporting anthropogenic climate.

While policy and market forces are the primary drivers of behaviour change, social norms and relationships with peers and friends within communities do influence decision-making and uptake of new behaviours. Environmental values can be developed from an early age via family, peers, formal and informal education, television, books, magazines and the internet. While knowledge on its own is not usually sufficient to drive behaviour change, educational policy that promotes an understanding of the science underlying environment issues means that individuals are better equipped to make future decisions to adopt pro-environmental behaviours.

### ***Policy instruments***

Policy should involve an effective mix of regulation, pricing mechanisms, education (including labelling), technological improvement, and collective action. However, policies that

emphasise the benefits (e.g. community, financial, wellbeing, etc.) of environmentally sustainable behaviour should be used in preference to restrictive measures, unless regulation is required in order to produce equitable outcomes.

It needs to be highlighted that even given the 'right' suite of supranational and national level policies, the local agencies responsible for implementation need to have control of the levers enabling implementation (e.g. decision-making power in relation to public transport provision). Where such powers are not in place, the relationship with the private sector becomes even more essential in order to achieve the widest possible support for regional sustainable development plans.

Different groups within society respond more or less favourably to different policy types. People with strong values relating to hedonism and egotism preferred policies promoting efficiency to curtailment policies. In contrast, those with strong alternative and biospheric ('green') values indicated a preference for curtailment policies aimed at changing user behaviour. Government regulations must be perceived as equitable and not favouring one section of society over another – most individuals will not choose to take actions for the common good if others are seen to benefit without cost to themselves. However the level of trust in the government can also affect this: for example in the Czech Republic case study area acceptance of government regulations is inhibited because of issues relating to a lack of transparency and a perceived regulatory bias towards some sectors of the economy.

An energy saving measure requiring little or no personal sacrifice or expense is much more likely to be adopted than one requiring behaviour change at the individual level. The current political climate means that politicians are unwilling to make unilateral change that they perceive will not be acceptable to electorates. This may not be because the public are waiting for a global consensus; indeed this study suggests that households across all of the study areas would like to see increased leadership, and solid arguments, from those in a position to shift policy away from the current carbon intensive society.

### ***Sectoral GHG policy***

While GHG emission reduction targets are the overall aim of climate change related policy, targeted approaches are required in order to address sectoral issues, such as transport, housing and food as explored in this study. The ability of households to reduce their GHG emissions via changes in behaviour is necessarily constrained by previous choices (e.g. location of home) and existing infrastructure, and are highly influenced by social norms.

### ***Households***

This study shows that significant reductions in household sector GHG emissions will depend on sufficient subsidies for costly modifications such as home insulation, efficient or renewable heat and power.

While industry has responded to calls for more energy efficient electrical goods (e.g. A+++ washing machines), there has been a marked increase in domestic energy use for electrical appliances in the past decade, with the improved efficiency of individual electrical appliances more than offset at the household level by the increased number of appliances being used. The agent-based model based on the Scottish case-study readily replicated this effect when modelling the period 2000-2010, while future scenarios to 2050 showed it continuing under a broad range of assumptions, at least until 2040 – and these scenarios did not take into account the possibility that entirely new kinds of appliance (for example, domestic robots, or 3D printers) could become widespread.

Low cost behaviour change measures alone will not result in the large GHG reductions required to achieve GHG emissions reduction targets. However meaningful reductions would be achievable if a significant majority of households were to adopt such measures, therefore they should be encouraged to do so.

### ***Food***

Two key approaches have been identified which may lead to a reduced GHG emissions from meat consumption. Firstly, reductions in meat consumption can effectively be approached from a local economic sustainability, or health perspective and secondly, rather than focusing on the complicated links between GHGs and meat production, a focus on other environmental

consequences of food decisions, such as deforestation to grow animal feed, may be more effective. Policies aimed primarily at reducing meat consumption are likely to be resisted in those economies more dependent on the agricultural sector and with a more rural demography. This view emphasises the continued need for nuanced implementation strategies across Europe.

#### *Transport*

In order to facilitate GHG emissions reduction in the transport sector, transport efficiency needs to be a key driver of regional and national infrastructure planning. Existing infrastructure, particularly in rural areas, often lacks effective public transport provision or opportunities for walking and cycling, inhibiting behaviour change away from commuting by car. Urban populations are generally more accepting of public transport because for them it can more easily provide a realistic alternative to private cars. Changing behaviour to reduce transport emissions depends on alternatives being available, including strategic investment in transport and communication infrastructure, for example high-speed internet facilitating working from home.

#### **Key messages for policy-makers, businesses, trade unions and civil society actors**

#### **Strategic recommendations**

In order to change individual behaviours so as to reduce national GHG emissions, clear supra-national strategies are needed. Indeed a long term, European level framework will be needed to support these strategies in order that a shared commitment to change can be recognised. Such an approach will provide a stable foundation supporting action at the local level given that decision-makers will be better equipped to overcome resistance to change at the local level, particularly by working with third sector parties. Within such a framework, policies and strategies need to fit to regional needs to provide a clear and consistent framework to aid implementation of practical measures to reduce household greenhouse gas emissions.

Conversely, as EU level policy-makers have long acknowledged, different policies and implementation structures will be required in different European regions, and any framework proposed by the EU must be flexible enough to allow national policy to be

tailored to context and be compatible with appropriate governance structures.

#### *Issues with key policy implications*

An important implication of the GILDED findings is that while energy and carbon equity is clearly an issue between Europe and developing countries, it is also a serious issue within Europe, and within countries. There are significant differences in the reported carbon footprint across the GILDED case study areas ranging from 2 tonnes to 48 tonnes per household per year. While the ambitious 2050 goal of 2 t/yr for some European households is a reality already today, it has also been established that while there is a positive correlation between income and personal CO<sub>2</sub> emissions, some financially wealthy households do have low CO<sub>2</sub> emissions as a consequence of lifestyle choices.

Policies need to be thought through in the appropriate detail, and include consideration of the whole energy system (supply and demand) in any GHG reduction targets. Two examples of complexities inherent in the processes are: wood is not a 'zero-carbon' fuel unless it is derived from certain species of tree on specified soil types and replanting occurs, and the adoption of pro-environmental behaviours may well be offset by increased emissions from other behaviours or activities.

#### *Barriers*

Decisions relating to household behaviours involve choices, these always being made within contextual constraints. Energy systems, infrastructures and the urban form influence lifestyles, and lifestyles shape their built and technological environment. Lifestyle policies exist and have been used to effect in the past – claims that these are unethical social programming or ineffective can be strongly argued against. If our small intervention package can yield up to 10% annual CO<sub>2</sub> reductions in one year, then surely this and other examples show what might be possible if a coalition of powerful and credible actors committed to a programmes of GHG emission reduction across communities and societies.

The increasing development and marketisation of new technology, and the resulting adoption curves for this, will likely continue to result in appliance envy and other rebound effects which further complicate the attempts to reduce emissions and

increases the uncertainty associated with achieving societal behaviour change objectives.

### **Future drivers, impacts and research needs**

#### *Step change or paradigm shift needed*

If large scale changes in energy demand are to be achieved in by 2050, then novel and politically difficult solutions need to be seriously considered. The overall strategy is not simply about energy saving, but about a fundamental transition of the European energy system (both supply and demand) meaning that a coherent integration of behavior/lifestyle oriented policies with energy technology and infrastructure policies is needed.

Examples that emerged throughout the research process included:

- The imposition of progressive pricing for fuel whereby the marginal cost per unit of energy increases with the amount used. This would require negotiated 'minimum energy requirements' to be established for fuel poverty, and new operating practices to be developed within the energy supply industry.
- Citizens' funds for renewable energy, carbon credits and green tax reform also have potential for providing wider benefits (equity, transparency etc), and therefore emission reductions.

USE our CARBON CALCULATOR for standardised monitoring of household efficiency changes resulting from initiatives.

Until recently, the predominant focus of research has been on the development of technical solutions to reduce GHG emissions, however there is now an increasing focus on social innovation. Ongoing research and network building in relation to sustainable lifestyles includes an EU FP7 project called SPREAD Sustainable Lifestyles 2050 (<http://www.sustainable-lifestyles.eu/about-the-project.html>). This is a European social platform project running from January 2011 to December 2012 and is something that the GILDED research partners are ideally placed to contribute towards. SPREAD involves a range of societal stakeholders (including business, research, policy and civil society) participating in the development of a vision for sustainable lifestyles in 2050. This process will result in a strategic action plan for policy-makers to help deliver innovative ideas for business, research and society, to enable more

sustainable lifestyles across European society. Such ideas will need to lead to actions capable of initiating a shift from personal choice, ownership and wealth to efficient sharing of resources such as multipurpose houses and transport, given that for much of the time such spaces are technically unused.

Demographic changes will also occur, sometimes predictably, in relation to ageing and living costs with impacts on housing densities which will drive changes in energy usage and adoption of new technologies and behaviours.

Global political agendas, not to mention economic agendas, are both to some extent responsible for the continuing drive for choice, consumerism, monetary wealth creation, resource exploitation and short-term planning. Questions which are difficult to predict the answers to will continue to be asked, such as can the localisation vs globalisation agendas be combined; how might climate scientists and pro-environment politicians counter increasing scientific scepticism (particularly in the USA) that make international action even less likely, and how is society to wean itself from energy derived from fossil fuels if there is profit to be made from its recovery and combustion?

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**Website** [www.gildedeu.org](http://www.gildedeu.org)

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**Further reading**

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**Related websites**

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