



Campaigning for Warm Homes

Consultation Document Response

Heat Call for Evidence

Source: BERR, Defra, CLG

NEA welcomes the opportunity to respond to the 'Heat Call for Evidence' published by BERR, Defra and CLG.

This response draws mostly on evidence from work in the United Kingdom where similar conditions are found and hence more consistent conclusions can be drawn. However, it is of note that much work in this area is being carried out throughout Europe, USA and Canada.

The UK Government has made a clear commitment both nationally and internationally to cut carbon emissions from the domestic sector. The Code for Sustainable Homes is a welcome step towards improving the energy efficiency of new homes. In addition, steps must be taken to improve the performance of existing stock which, by 2050, will still comprise 75% of the total housing stock.

NEA welcomes the Government's proposal to adopt a strategy for heat. Actions resulting from this strategy should have four main aims:

- lower carbon emissions
- increased domestic energy efficiency
- improved thermal comfort and lower expenditure on fuel for those in or near fuel poverty
- support for a growing industry and its related supply chain.

As fuel sources shrink and prices rise, the long-term solution to fuel poverty is to end people's reliance on fossil fuel. In the longer term, this means developing renewable energy solutions. In the medium and short term, research and implementation of these renewable solutions must not overshadow the need for a secure, consistent and affordable energy supply.

Decarbonising heat can only achieve its fundamental aims of environmental protection if it is done in the context of reducing demand for diminishing fossil fuels.

Running parallel to carbon reduction commitments is a Government commitment to sustainable development. The principles of sustainable development require a secure economic, social and environmental context.

It is from that perspective that this response is written. NEA's aim of eradicating fuel poverty puts it in a good position to consider the economic, social and economic drivers and consequences of proposed actions to ensure that the response is truly sustainable.

NEA has campaigned for 27 years for the case of the fuel poor to be considered in policy making. Informed by research and demonstration projects for new technologies, NEA will take this opportunity not only to share its knowledge of technical solutions, but also, and arguably more importantly, to help inform the Government of effective ways of implementing these technologies and how to ensure that the impacts do not adversely affect those most vulnerable in society.

NEA's response follows the sequence of the specific questions posed.

For the original reference documents and template, visit:

<http://www.berr.gov.uk/files/file43609.pdf>



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Question 1: Table 2.1 sets out technological measures for reducing carbon emissions from the heat loads of existing homes, with cost estimates. Do you have any comments about this analysis?

We strongly recommend that running costs of each technology are also considered alongside capital costs and potential carbon savings. This will more accurately reflect the true cost of the technology and its social impacts. Systems that are expensive to run are not an appropriate solution for many families, particularly the three million households in England already in fuel poverty.

It is irresponsible to consider insulation separately from the other micro-generation technologies. Insulation should be a prerequisite to micro-generation, not an alternative. If a home is not sufficiently well insulated, micro-generation will be inefficient. As many of these decarbonising technologies require some sort of electrical input, this inefficiency will result in unnecessary carbon emissions and costs. Insulating 'hard-to-treat' properties, such as those with solid walls, can be technically challenging but it is a challenge that must be met if micro-generation is to be meaningfully implemented.

Using waste timber in biomass boilers is of significant advantage on both micro and macro scale. The financial and environmental benefits from diverting waste from landfill should be noted here.

It is misleading to state that solar thermal technology 'replaces' hot water load. Solar thermal systems, like most other micro-generation technologies, can make a contribution to energy generation and to fulfilling some heat and DHW demand. However, it is rare that these systems at present can consistently produce enough energy to totally replace existing systems. This has implications for the expectations of the public, the reputation of the industry and, significantly, the true cost of running a comprehensive heat and DHW system.

Air-source heat pumps are a notable omission from this analysis. Significant work has been carried out across the UK and abroad to add to the evidence base for these systems as a valuable source of low carbon and relatively low-cost heat. For example, an NEA installation in Fylde reduced a disabled householder's electricity costs by approximately £50 a month, with projected carbon dioxide savings of 3.4 tonnes a year. Other projects have had similarly positive results. We therefore consider it a technology worthy of analysis.

Potential carbon savings must be considered alongside cost. Decarbonising electricity is said to require an upgrading of the system to support a four-fold increase in demand. It is not acceptable to pass this cost on to the consumer, particularly those who are in fuel poverty. In addition, increasing dependence on a single source of fuel is strategically inferior to diverse and alternative sources.

Question 2: What scope is there for greater use of electrical heating to reduce carbon emissions from heating? In what circumstances is electrical heating best deployed?

To attain a sustainable and therefore meaningful solution, decarbonising heat should have parallel aims of lowering costs and securing supply. Although electricity prices are rising more slowly than gas prices, they have increased by 66% since 2003, adding an increasing burden to household budgets and resulting in increasing numbers of fuel poor households.

Electricity can be efficient in driving air and ground-source heat pumps. In these circumstances, high coefficients of performance (CoPs) mean that more kilowatt hours of heat are generated than kilowatt hours of electricity consumed, sometimes as much as a ratio of 4:1 i.e. 400% efficient.

Diversifying the type of fuel used is also important; reliance on one source of fuel at a micro and macro scale should be discouraged.

Mains gas remains the most cost-effective fuel option. Electric heating should not replace gas as this would result in significant cost implications. More than four million households in the UK already live in fuel poverty, needing to spend more than 10% of their income to keep warm. They should not be further financially or socially disadvantaged in pursuit of environmental objectives.

Question 3: Is it desirable to include emissions from all heat use in a carbon market, even if it is indirectly through the supplier?

NEA welcomes acknowledgement of the limitations of a carbon market. The proposal for such a system may have negative impacts, particularly for the fuel poor. For example:

- The paper states that opportunities for cost-effective mitigation are not always taken up. Research shows that this is particularly prevalent among the fuel poor.
- The paper acknowledges that 'impacts on fuel prices of carbon trading will have a negative effect on fuel poverty.' This cannot be ignored and should not be dismissed as an impact of 'any policy which imposes a carbon price on domestic heating fuel use.' In order to promote other objectives of wellbeing, sustainable communities and reducing inequalities, this impact must be countered. A compulsory and effective social tariff can help offset this. This would ensure environmental protection, social equity and economic inclusion; an altogether more sustainable and holistic solution.

It is not within our expertise to respond to questions 4 and 5.

Question 6: Would you anticipate significant impacts on fuel poverty as a result of means to limit heat emissions? In what ways might these impacts be limited?

The ‘means to limit heat emissions’ are varied and as such have varying impacts on fuel poverty. Some of these means have been covered in this paper while others have either been ignored or been given surprisingly little attention.

Below is a list of actions that NEA considers to be effective in reducing heat emissions. As requested, ways to mitigate this impact are also suggested.

Means to limit heat emissions	How might it impact on the fuel poor	Comment
Insulation	Subsidised insulation programmes	Warm Zones is proving effective here. Once cavity walls have been filled, hard-to-treat homes must also be treated. Hard-to-treat homes comprise as much as 30% of the housing stock. Grant maxima must be raised considerably to cover the additional cost associated with solid wall insulation.
Design	Quality design and efficient methods of construction should not become an elite product.	It is right that the focus of this paper is on measures that can be implemented in existing stock. New-build affordable housing must incorporate energy efficiency design to ensure fuel-poverty proofing for occupants.
Support development and uptake of microgeneration systems	<ul style="list-style-type: none"> • Increase grant maxima/promote soft loans to eradicate excess payments. • Encourage tariffs that support the demand of technologies e.g. economy 10. 	Micro-generation can play an important role but the technology is not enough. Encouraging take-up, correct use and viable tariffs to maximise efficiency are crucial.
Carbon market	A significant and well targeted obligatory social tariff will be needed to safeguard the fuel poor.	As with any equitable ‘free market’ system, provision should be made to safeguard those to whom the benefits do not trickle down. As fuel prices rise irrelevant to decarbonising measures, a social tariff should be introduced to safeguard the fuel poor.
Rationing	Publicising health threats and benefits	Encouraging rationing of fuel is not safe for some people. E.g. advice to turn down a thermostat by 1°C, if adopted by vulnerable people, can have negative health impacts. This is also a potential danger with smart metering.
Microgeneration in off-gas areas	Potentially positive impact on fuel poverty, particularly in hard-to-treat homes	Once systems are in place and adequate user guidance issued, micro-generation and renewable systems can provide affordable fuel.

Question 7: Is our view of these technologies correct? Have we left out any technologies that could make a significant contribution?

NEA welcomes the acknowledgement that some types of micro-generation are not cost effective in areas that have a mains gas connection. In terms of energy efficiency and fuel poverty, it would also be prudent to emphasise that insulation is a prerequisite to all renewable energy solutions. NEA also welcomes recognition of the contribution that waste can make to heat generation.

Air-source heat pumps are a notable omission from this analysis. NEA demonstration projects show that this technology provides consistent heat, is easily controlled and is low in terms of disruption when being installed.

A crucial point of omission currently is standardisation for these products. NEA believes that once heat pumps have a standard agreed by all manufacturers, they will be more readily taken up by consumers. Work in the North of England is currently underway through Community Energy Solutions (CES) to install up to 300 air-source heat pumps. One of the aims of this project is 'market transformation.' Large scale installations should bring the price of the technology down and therefore make it more accessible to householders. Training enough workers to install these systems should also boost the supply chain and make this low carbon technology increasingly feasible for incorporation into mainstream markets.

Question 8: Is our analysis of potential biomass fuel supply accurate? Do you have evidence relating to the long term sustainability of biomass, or demand pressures from other EU countries?

Paragraphs 87-89 note that renewable heat technologies are unlikely to be cost competitive with conventional heating fuels. This is accurate in terms of current capital costs of systems. However, a more astute consideration would be of capital and running costs, taking into account current and future projections. Doing so would suggest that some technologies already on the market are more viable than traditional solutions, particularly, as this paper notes, in rural locations. As fuel prices increase, the most cost-effective solution will be that which has low running costs.

The 'chicken and egg' nature of the biomass industry has been acknowledged in this paper. In NEA's experience, take-up of this fuel source is stifled by a supply chain that is not adequately developed.

NEA's biomass project has been most successful where householders have sourced their fuel informally through waste wood. The existence of a 'global biomass market' creates concerns relating to the environmental impacts of transport involved and also to the cost implications this for the end user.

Question 9: Do you agree with the assessment of the potential for heat from biomass and the barriers to its deployment? How can these barriers best be tackled? Are there other barriers that should be addressed?

The potential for biomass is proven. It can be a low carbon, low tech solution to fuel poverty, particularly in off-gas areas. We agree that potential for a reduction in air quality must be considered. A quality standard will help ensure that products are as

clean as possible. However, this should not be used as an excuse to increase the cost of the system.

This analysis omits the issues that would affect the end user and take up of this heating system. This is a common mistake and must be rectified if a true picture of the viability of this technology is to emerge. Biomass, particularly burning timber in stoves, requires a substantial ability to source, store and load the fuel. Installing biomass boilers can also be very disruptive and the costs involved can be unpredictable. This can have a negative impact, particularly for the more vulnerable and low-income members of society. These issues should not be considered as a barrier to expanding the market, but as things to consider when choosing the specific location of a system and its supply chain.

Question 10: Do you agree with this assessment of the potential for heat from waste and the issues restricting deployment? How can these barriers to heat from waste be tackled? Are there other barriers which we have not identified?

Our clients have found the use of waste wood in multi-fuel burning stoves to be of huge benefit, providing a free source of fuel. In addition, our trials in Trafford showed that it can have the additional benefits of reducing the council's landfill tax bill and promoting social cohesion through wood clubs.

On a larger scale, if incinerators are to be used, research on impacts to health must be robust. Convincing the public of its safety will be a major barrier to deployment.

Questions 12 and 13: Are there any other significant non-financial barriers specific to the deployment of renewable heat technologies as well as those set out at paragraphs 87-115 above? How might Government address them?

It is inaccurate to state that underfloor heating is needed with air-source heat pumps. A more financially viable option is to resize radiators and install a model with fan convectors in order to increase their surface area and circulate the warm air more effectively.

Other significant barriers include:

- I. *Installer knowledge and accreditation:* The accreditation scheme run by BRE is welcome in setting a quality standard for installers. However, there is concern that the cost of this is too high and that this is limiting take-up. Consequently, a significant opportunity to create jobs and boost local economies is being missed. Air-source heat pumps should also be included in the scheme.
- II. *Product standardisation:* As the market expands and new systems develop it is essential that a standardised and independently validated system is in place to rate the efficiency of the products. This currently does not exist for air-source heat pumps.
- III. *Consumer knowledge to increase up-take:* Many householders are sceptical about change, particularly regarding new technologies. Much work has to be done on disseminating information and discussing advantages and, importantly, potential disadvantages. Using an independent organisation and other members of the community is important here. Recommendations I and II above can also help.
- IV. *User information:* A system is only useful if the user knows how to get the most out of it. For example, the system must be effectively controlled, maintained and used

at the most efficient time of day. NEA's report, '*Renewable Energy: how to get the best for your clients,*' and forthcoming user guides can be of help here.

Question 14: Do you believe that financial support is essential, desirable, or not essential to achieve a significant increase in the uptake of renewable heat? Is your answer the same for all technologies and fuels?

In relation to the fuel-poor sector, it is clear that financial constraints are a significant issue. For this sector, loans are not an option as debts must be minimised and a client contribution is not feasible.

Media and Parliamentary scrutiny have highlighted the fact that current grant levels are often not sufficient and Warm Front clients are being asked to pay towards the cost of work.. Currently some 17% of all jobs exceed the grant maximum (considerably higher where heating improvements are installed) requiring an average client contribution of more than £500. Grant maxima must increase to a level that will obviate the need for a client contribution.

For the able to pay sector, financial support is also desirable. Some sections will need loans and subsidies to support the initial expenditure. In some other cases, microgeneration systems can function as a status symbol and should be promoted as such.

NEA emphasises that financial support is not enough on its own. Experience shows that people can indeed be mistrustful of offers of 'free' systems. Community/tenant development work must happen to gain the trust and understanding of householders.

Question 15: What level of support would bring on how much of each renewable heat technology? How cost effective would you judge this to be in relation to other ways of reducing emissions? Can you supply supporting evidence based on the costs of equipment, infrastructure or renewable fuels?

The list below cites some of the prices applicable to some NEA projects. It is of note that these are demonstration projects, hence installation and equipment costs do not benefit from economies of scale. We reiterate that running costs must also be taken into account alongside the capital costs.

All estimates include equipment, installation and all other necessary materials. Costs for these projects will vary dramatically depending on the standard and type of system currently in place.

- Biomass: £5,000 - £6,000
- Air-source heat pump: £5,000 - £6,000
- Solar thermal: £3,000 - £4,000
- Solar PV: £8,000 - £10,000

Supporting the dissemination of information and community development will be necessary alongside supporting the development and installation of the actual technologies.

Question 16: If you believe a funding mechanism is needed to expand renewable heat, do you have any ideas for a different mechanism to the three set out above? What are your views or preferences between the various options set out here? Do any of the options create particular barriers to certain heat technologies or fuels? Are there particular difficulties including bio-methane in a renewable heat support mechanism?

NEA welcome BERR's acknowledgement that, as well as environmental impacts, 'the overall cost to society' is an important factor. It is worth bearing in mind that if systems are not cost effective to those living in poorest quality homes, a huge opportunity will be missed. It is also important that a range of technologies is covered to ensure that hard-to-treat homes and non-traditional housing types can benefit from the support.

Grants: Grants can be a welcome short-term solution. However, recent funding programmes (LCBP phase 2) have very low take-up rates. Promotion must be pro-active, criteria simple and guidance clear. Difficulties can also arise among fuel-poor clients where the grant does not cover the whole cost of work and so comprehensive works cannot be carried out. Consideration must be given to supporting the whole process, from disseminating information to ensuring adequate insulation, to installation of the micro-generation/renewable energy solution and post-installation aftercare.

Feed-in tariff: NEA welcomes the recognition that fossil fuel suppliers may have to subsidise this feed-in tariff. It is important that this cost is not passed on to the fuel poor. An added income stream would be an incentive to take-up not only for the fuel poor, but also for those nearly in fuel poverty and others.

Renewables Obligation: This has already stimulated welcome action by the suppliers. Again, the concern, expressed by many stakeholders including the suppliers, is that schemes such as RO will lead to increased prices. It is unlikely that small producers will benefit from this (although Scottish and Southern are making headway here), but instead the premium priced electricity will benefit large-scale companies.

The fines for not adhering to ROC targets have proved to be substantial. However, the destination of this money is unknown. Using this money to specifically help the fuel poor would be a very welcome move. It would be of great benefit to the increasing numbers of people in fuel poverty and enable the Government to invest additional resources as it endeavours to meet its fuel poverty targets.

It is not within our expertise to respond to questions 17 and 18.

Thank you for your consideration of the above points. If you require further information, please contact me on:

e. Victoria.Eynon@nea.org.uk t. 0191 261 5677 m. 07939604277