Response from the Mineral Products Association to the Energy and Climate Change Committee Inquiry into Heat

1. Executive Summary

1.1. Government has got the balance wrong by incentivizing the production of expensive inefficient renewable heat and not incentivizing large scale efficient use of renewable heat.

1.2. The Renewable Heat Incentive is expensive and poorly formulated.

1.3. Renewable energy targets will only be met with the large scale participation of major industrial operations such as cement, lime and asphalt.

1.4. Renewable heat use in mixed biomass/fossil fuel uses needs to be incentivized otherwise incentive payments will move biomass from industries that currently use them to industries that don't, with no net benefit.

1.5. Government is attempting to address the symptom of heat demand in the domestic sector and little effort is being placed on long term heat consumption minimization. Building 'thermal mass' use should be maximized.

1.6. Biomass supply is insufficient to deliver all of the policies and therefore it is most important to utilize the limited supplies in industries that can maximize its potential.

2. Introduction

2.1. The Mineral Products Association (MPA) is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries. With the recent addition of The British Precast Concrete Federation (BPCF) and the British Association of Reinforcement (BAR), it has a growing membership of over 450 companies and is the sectoral voice for mineral products. MPA membership is made up of the vast majority of independent SME companies throughout the UK, as well as the 9 major international and global companies. It covers 100% of GB cement production, 90% of aggregates production and 95% of asphalt and ready-mixed concrete production and 70% of precast concrete production. Each year the industry supplies £9 billion of materials and services to the £120 billion construction and other sectors. Industry production represents the largest materials flow in the UK economy and is also one of the largest manufacturing sectors[1].

2.2. This response relates largely to the MPA Cement and British Lime Association activities which are part of the Mineral Products Association.

3. Is the government taking the right approach to reduce heat energy demand?

3.1. Government has chosen two principle policy approaches:

3.1.1. to reduce heat demand through energy efficiency

3.1.2. to decarbonise heat through incentivising certain limited technologies.

3.2. Government has an excess of policies to address energy efficiency or reduce greenhouse gas emissions. These numerous policies are creating a cumulative burden of cost on manufacturing sectors such as the UK cement and lime manufacturing. This cumulative burden is demonstrated in the MPA evidence to the Environmental Audit Committee[2]. These two sectors are examples of the mineral products targeted directly through 'command and control' legislation and economic instruments but these sectors are not provided with the opportunities of incentive schemes that other sectors of the economy benefit from. As such Government has got the balance

[1] "Make the Link: The Mineral Products Industry's Contribution to the UK", 2012, http://www.mineralproducts.org/documents/MPA_MTL_Document.pdf

[2] Environmental Audit Committee: Energy Intensive Industries Compensation Scheme Sixth Report of Session 2012–13. Ev36

wrong when it comes to 'carrots and sticks' for reducing heat demand and decarbonising heat.

3.3. Cement and lime production cannot benefit from the Renewable Heat Incentive (RHI) because the scheme has three principle limitations:

3.3.1. It does not allow the use of biomass to be supplemented by fossil fuels. This mixed use is necessary in some industries to maintain fuel security of supply and cater for biomass fuel interruptions.

3.3.2. The RHI prescribes technologies that generate 'metered' heat. Directly fired operations in kilns or furnaces use heat directly and are not metered via a heat carrier e.g. steam. However, directly fired biomass applications can easily measure the amount of biomass use by measuring the calorific value of the fuel input.

3.3.3. RHI does not include any equipment that is not new. Many industrial processes have long investment life cycles and fuel switching will often, but not always, require new equipment. More likely are modifications to existing equipment. The requirement for the RHI to be applied to new equipment is a significant limitation to biomass heat use in industry, particularly where incremental change is a necessity to minimize production intervention.

3.4. In the industrial sector it is companies with large energy bills that are taking action to minimise their costs, tackle energy and heat efficiency. The UK cement industry has published its 'Greenhouse gas strategy to 2050'. Outlining an ambitious target of -81% GHG emissions by 2050, against 1990, (the Kyoto Protocol baseline year), the UK cement industry has set out for the first time the actions they, and others, need to take to exceed the UK Government's own -80% aim. Government support to assist and accelerate the delivery of this strategy is noticeably absent and without such support the maximum ambition of an 81% decarbonisation of UK cement production by 2050 may not be delivered.

4. What progress is the government making on reducing the demand for heat?

4.1. Some sectors of the economy have already taken considerable early action. The minerals manufacturing sector and in particular cement and lime manufacturers have made considerable improvements to reduce their heat demand and to decarbonise their heat use. The UK cement industry has reduced absolute GHG emissions by 54% since 1990 which out strips the UK economy as a whole. Waste derived fuel used to replace traditional fossil fuels in the UK cement industry is now at 40% thermal replacement, biomass is now at 17%, but more could be done with targeted assistance from Government. Similarly, the UK lime industry has replaced fossil fuels with waste and part biomass waste, but more opportunities exist within the correct framework.

4.2. Whilst it is important to reduce the nation's reliance on fossil fuels across the whole economy, heat policy should also recognise that the thermodynamics and chemical reactions necessary in some processes require heat to be delivered in a particular way, whilst others have fuel limitations due to product quality. As with the Carbon Budgets that are enshrined in the Climate Change Act, reducing the demand for heat can be met by reducing the industrial base that relies on heat energy. This is unsustainable, and until Government create a complimentary relationship between GHG/energy policy and industrial manufacturing policy environmental policies will continue to erode the competitiveness of the UK manufacturing sector.

4.3. There are a range of Government policies that are relevant to the demand reduction of heat that span the domestic, commercial and industrial areas of the economy. Policies from planning, through building regulations, to building performance certificates all influence the demand for heat in our built environment. Getting the right balance for both heating and cooling is important. In particular

there is a need to get the right balance in the heat policy between the different uses of heat and managing heat.

4.4. The Mineral Products Association is somewhat unique in that our members' activities are broad enough to include the extraction of minerals, the processing of those minerals into construction materials and the design of thermally efficient solutions for commercial and domestic buildings, structures and infrastructure.

4.5. The building fabric in particular represents an area where heat energy demand can be reduced much further through a move to more passive heating and cooling solutions. The proliferation of passive heating and cooling systems utilising the 'thermal mass[3]' benefits of heavyweight materials in buildings would have considerable long term benefits for the economy, emissions reduction targets, energy security of supply and help reduce the risk of future overheating in buildings as a consequence of climate change.

5. Biomass is deemed a key fuel for heat production from both the cost and GHG perspectives. What should be done to ensure methods of calculating biomass GHG balance represent an accurate picture?

5.1. In the UK cement sector, use of fossil fuels accounted for only 60% of combustion fuel use in 2012, down from 94% in 1998. This means that the cement sector has taken considerable early action in decarbonising its heat demand by switching to waste derived and biomass fuels. The challenge for the future will be to make sure that the biomass fuels remain available to cement and lime manufacturers and are not simply diverted to other areas of the economy that are currently receiving incentive payments via the Renewable Heat Incentive which are inaccessible to the cement and lime operators. Consequently, there is a measurement issue when it comes to deciding whether policies such as the RHI are generating additional biomass heat or just moving the biomass heat consumption from those that don't currently receive RHI to those that do.

5.2. There is a debate that encourages CO_2 from biomass fuel use to be counted in GHG inventories. However, there is a danger that this will discourage the switch from fossil to biomass fuels. Without the 'carbon neutrality' of biomass fuels, the incentive to switch away from fossil fuels is vastly diminished in some sectors that require heat to be delivered in a particular way e.g. directly in a kiln. Furthermore waste biomass that would otherwise have been landfilled should also retain a 'carbon neutral' status to further encourage the maximised use of biomass that is technically or economically too difficult to retrieve for non-fuel uses e.g. recycling.

6. What are the lock-in, costs and GHG savings from the promotion of different forms of domestic heating solution?

6.1. The renewable heat incentive scheme has generated 167,816,399.92kWhth and made £7.62m in payments resulting in a cost of 0.0454 £/kWhth of carbon neutral energy[4]. The cost of the RHI is expected to rise considerably as the payments to date have been made using lower non-domestic tariffs. In the future as domestic uptake increases, the value for money of the renewable heat will decrease. The mineral products industry could offer considerably better value to the tax payer to deliver renewable heat.

7. Should the government take any further specific actions in relation to cooling?

[3] http://www.concretecentre.com/technical_information/performance_and_benefits/thermal_mass.aspx

[4] Calculated from figures in the RHI Annual report

7.1. In the domestic sector there is considerable opportunity to gain benefit from the use of thermal mass in buildings. Thermal mass is a term that describes the ability of a material to store heat. To be useful in the built environment, the material must also be able to absorb and release heat at a rate roughly in step with a building's daily heating and cooling cycle. Concrete and masonry products do this well and, being dense materials they can also store a lot of heat. Timber absorbs heat too slowly to offer much effective thermal mass and steel conducts heat too rapidly to be in synchronisation with a building's natural heat flows over the day.

7.2. The amount of CO_2 that can be saved from utilising the thermal mass of a building depends on the building type and the way in which its thermal mass is used. In the case of a very heavyweight building, the additional concrete can result in a slightly higher level of embodied[5] CO_2, but the operational savings afforded by the thermal mass will typically offset this in a matter of months rather than years.

7.3. For housing, the situation is slightly different: The embodied CO_2 in a typical masonry home is about 4% higher than an equivalent timber frame home. Studies by Arup and the NHBC Foundation both arrived at this figure. The Arup study went on to look at operational impacts and found that the passive benefits of thermal mass during the heating seasons resulted in CO_2 savings that offset the figure of 4% in around 11 years.

7.4. Consequently, interventions in the building sector that promote and utilize the benefits of thermal mass to manage heat have the potential to provide long lasting energy efficiency and CO_2 reduction opportunities.

[5] Carbon dioxide emitted when the materials were manufactured