

RURAL ECONOMY AND CONNECTIVITY COMMITTEE

SUBMISSION FROM THE MINERAL PRODUCTS ASSOCIATION

DRAFT CLIMATE CHANGE PLAN (RPP3)

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 British Precast and the British Association of Reinforcement (BAR), it has a growing membership of 480 companies and is the sectoral voice for mineral products. MPA Membership is made up of the vast majority of independent SME quarrying companies throughout the UK, as well as the 9 major international and global companies. It covers 100% of cement production, 90% of aggregates production, 95% of asphalt and over 70% of ready-mixed concrete production and precast concrete production. Each year the industry supplies £20billion worth of materials and services to the Economy and is the largest supplier to the construction industry, which has annual output valued at £144billion. Industry production represents the largest materials flow in the UK economy and is also one of the largest manufacturing sectors. For more information visit: www.mineralproducts.org

Question 1. Progress to date in cutting emissions within the sector/sectors of interest and implementing the proposals and policies set out in the RPP2

2. As noted in the RPP3, emissions from Scottish industry have seen a considerable reduction of 50.5% between 1990 and 2014. It is also recognised that a large proportion of this has sadly been achieved through deindustrialisation.
 3. MPA represents the cement sector, a fuel and electro-intensive sector with one plant in Scotland. A large proportion (70%) of the emissions produced in the manufacture of cement are unavoidable 'process emissions' generated when the raw materials are heated. The remaining 30% of emissions arise from the combustion of fuels. Since 1998 the UK cement sector has reduced emissions per tonne of cement by 23%. This has been achieved through fuel switching from coal to waste derived fuels, the use of less carbon intensive substitute materials such as ground granulated blastfurnace slag (a by-product from steel manufacture) and pulverised fly ash (from coal-fired power generation) and heavy investment in energy efficiency measures and technologies. The sector is regulated under the EU Emissions Trading System.
 4. The cement sector takes its decarbonisation responsibilities seriously and in 2013 was the first national cement sector association to publish a decarbonisation roadmap showing how greenhouse gas emissions could be reduced by more than 80% by 2050 with help from policy makers and others. The sector also worked with the UK Government and its consultants to produce the Government cement sector decarbonisation roadmap and is currently working on finalising the action plan that sets out the tasks required to achieve the decarbonisation identified in the roadmap.
 5. Long term, the RPP3 states the ambition of Scotland is to deliver "*emissions reductions through a circular economy approach in our business and industry sectors by 2050*". The cement sector can and does do more for the low carbon economy than just reducing its direct emissions in manufacture. As such, the sector can play a valuable role in helping Scotland to achieve this circular economy approach. For example, the production of cement already results in a net consumption of waste. In 2015 the UK production of cement recycled 1.6 million tonnes of
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wastes and by-products from other industries. Some of these wastes were used for their heat value, where in 2015 they accounted for 42% of thermal input whilst at the same time providing mineral input into the final product in a simultaneous process called 'co-processing'. The advantage of the cement sector burning these wastes compared to energy from waste plants, is that as well as this recycling of the mineral content of the waste, there is no residue left over for landfill disposal. In 2015 over 150,000 tonnes of fuel ash was recycled into cement. This recycling of mineral and metal content in UK cement production is not counted towards UK and EU recycling statistics but it provides a valuable contribution to the circular economy and Scotland has an opportunity to formally recognise this recycling achievement. Furthermore, since 2013 all process waste from the manufacture of cement has been recovered for use in land remediation and as a fertiliser on farmland. Zero process waste from cement manufacture is sent to landfill, so the sector is already meeting Scotland's aspirations for reducing waste to landfill.

Question 2. The scale of reductions proposed within their sector/s and appropriateness and effectiveness of the proposals and policies within the draft RPP3 for meeting the annual emissions targets and contributing towards the 2020 and 2050 targets.

6. RPP3 is relying on EU ETS to deliver the decarbonisation of energy intensive sectors. In doing so RPP3 also relies entirely on the provisions within EU ETS to protect sectors at greatest risk of carbon leakage and ensure that decarbonisation is not achieved through deindustrialisation. The cement sector has previously been recognised as being at risk of carbon leakage. In negotiations for Phase IV (2021-2030) of EU ETS, the cement sector is one of three sectors that have been singled out for an 'import inclusion scheme, also known as a border adjustment mechanism (BAM). This is based on the assumption of low trade intensity of the cement sector and will require EU cement producers to purchase all of the CO₂ allowances equivalent to their production whilst other sectors in EU ETS would continue, at least in the short-term, to receive free allocation as mitigation against carbon leakage risks. MPA is extremely concerned about the impact a BAM could have on UK and Scottish cement producers. Imports of cement to GB are already over 17% and a large increase in cement import terminals has been observed since 2001. EU clinker (the intermediate cement constituent) trade intensity is 59%^a. There has been no regulatory or environmental impact assessment carried out to show that a BAM would result in greater or even equivalent emissions reductions compared to current methods for carbon leakage mitigation, and the decision to introduce a BAM will be taken before any details of the design of it are known. The BAM would create an asymmetric and unharmonised EU ETS and it must be stopped before irreparable damage is done to the manufacture of cement in Scotland and the subsequent loss of jobs.
7. Climate change is a global, rather than a regional issue. Ideally it should be tackled at a global level. Trying to address the issue in smaller and smaller geographical areas moves the action further from the main global problem and prevents a holistic view of the problem to be overcome. Regional action has its place but it must be set in a global context. To this end, Scottish target setting and carbon budgets should take into account the abatement potential of the specific sectors and operations in Scotland. This principle follows the United Nations

^a Calculation by CEMBUREAU (The European Cement Association) using 2012 Eurostat data

Common but Differentiated Responsibilities and Respective Capabilities (CBDR–RC) which is used by the United Nations Framework Convention on Climate Change (UNFCCC). This principle acknowledges the different capabilities and differing responsibilities of individual countries in addressing climate change^b. By following this principle Scotland can ensure that targets and budgets are fit for purpose and achievable.

8. In setting carbon budgets that are fit for purpose, Scotland has an ideal opportunity to lead the UK in the measurement of consumption emissions. This is the only method of accounting that reflects the true level of emissions responsibility in Scotland. The measurement of consumption emissions will also show if Scotland is achieving decarbonisation through deindustrialisation or through real emissions reductions. MPA therefore calls for Scotland to take account of consumption data including quantification and analysis of the 'carbon' cost of Scottish manufacturing compared to other nations.
9. The non-domestic renewable heat incentive (RHI) has been included in the RPP3 as a policy that can contribute to the reduction of industrial emissions. MPA has been lobbying UK Government for some time to change this scheme to deliver much greater value for money by targeting larger, more efficient users of biomass, such as the cement sector. Under the current rules the cement sector cannot access RHI because it excludes the use of biomass in operations that use the heat directly rather than through an intermediary such as steam. In recent years MPA has observed a levelling off of waste biomass fuel use in cement manufacture and believe this is a direct result of policy drivers like RHI incentivising the use of biomass in other sectors, which is increasing competition for finite biomass resources resulting in MPA members returning to the use of coal. The Scottish Government has an opportunity to influence the RHI scheme to get much greater value for money by incentivising efficient directly fired operations to increase their use of biomass.
10. In RPP3, the Scottish Government suggests that it strongly favours timber over other construction materials viewed as having higher embodied carbon, such as concrete. Cement is one of the ingredients in concrete and although the embodied carbon of cement is relatively high, actually concrete/masonry is a low carbon product that is locally produced. NHBC Foundation research that resulted in the publication entitled 'Operational and Embodied Carbon in New Build Housing' states that "No significant differences emerged between masonry and timber construction in terms of overall CO₂ impact over 60 and 120 year study periods." Furthermore, only considering embodied carbon, the carbon emissions associated with the manufacture and transport of a product to the construction site, is entirely misleading and can result in the wrong behaviours and decisions. Carbon must be considered on a whole life basis not just on an embodied basis. All materials have their place and their properties must be considered in the context of the building and infrastructure in which they are used. For example, the thermal mass benefits of concrete can hugely reduce the carbon emissions from a building during its use by reducing the need for cooling and heating. Also, during the life cycle of concrete it will reabsorb around a third of the carbon emitted during manufacture^c. Concrete also has many advantages over timber from durability to fire resistance, from acoustic performance to flood resilience. MPA believes that Scottish timber is not always suitable for the majority of construction purposes, which results in the use of imported timber products. Timber

^b <http://climatenexus.org/about-us/negotiation-issues/common-differentiated-responsibilities-and-respective-capabilities-cbdr>

^c MPA The Concrete Centre, "Whole Life Carbon and Buildings", 2016

must undergo considerable chemical treatment before use, it is a fire risk while in use (Government statistics show that fires in timber framed buildings are more extensive than those of no special construction^d.) and at the end of life it is unrecyclable due to its classification as hazardous waste, a result of the required chemical treatment. Timber is not as carbon neutral as it may appear on the surface as the significant end of life emissions (burning and decomposition) are not considered when only the embodied carbon is accounted for and MPA challenges the Scottish Government to rethink its favouring of timber and instead provide stronger support for low carbon and locally produced concrete for these reasons and those set out below.

11. Concrete is a low carbon product that has high thermal mass properties, which, when used correctly in buildings, enables the storage and then slow release of heat. This has the effect of stabilising the temperature within a building so that less heating is required in winter and less cooling is required in summer, but the benefits are year-round as the diurnal temperature cycle peaks are reduced. This in turn reduces the energy demand of buildings such that the embodied carbon dioxide of a typical building can be “paid off” within 11 years^e. This ‘demand side flexibility’ offered by heavy weight buildings could be a key solution to the growing imbalance between energy demand and renewable energy generation^f. As space heating alone accounts for around 20 to 50 per cent of a building’s energy consumption depending on type^g, and around a third of the carbon emissions from all UK buildings^h, concrete can make a valuable contribution to reducing emissions in residential and service sectors.
12. A recent studyⁱ by the Mackintosh Environmental Architecture Research Unit has shown that overheating of a building in summer is by no means a problem limited to the southern half of the UK. The research involved two years of temperature monitoring in 26 new-build low energy homes in six developments located across Scotland. The results showed overheating to be a problem in nearly all of the dwellings, particularly in bedrooms. The key conclusion of the study was that whilst the risk of overheating is greater in southern England, the combination of heat retention and recovery, occupant behaviour and poor design largely overrides the benefit of a northern location. This suggests that the cooling potential offered by thermal mass is as relevant to housing design in Scotland as it is elsewhere.
13. Further benefits of concrete include that it is fire resistant and it is a very durable material so it needs to be replaced less often and when it reaches end of life, it is 100% recyclable. Concrete also acts as a carbon sink, partly while in use, but once crushed it has been shown to reduce the embodied carbon dioxide of cement leaving the factory gate by 20% after a 160 year period in use^j. RPP3 specifically singles out timber as the Scottish Government’s construction material of choice, but to dismiss concrete, when it can contribute so much to decarbonisation, is a mistake and would prevent Scotland from benefiting from the clear advantages that thermal mass and concrete can bring over the whole life of a building.

^d Department for Communities and Local Government, “Analysis of fires in buildings of timber framed construction, England, 2009-10 to 2011-12”, December 2012, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/66062/Timber_frame_analysis_17_Jan.pdf

^e The Concrete Centre “Thermal Mass for Housing”, 2006

^f 3E Report for CEMBUREAU (The European Cement Association), “Structural thermal energy storage in heavy weight buildings- analysis and recommendations to provide flexibility to the electricity grid”, October 2016

^g Part L Review 2010: IAG briefing note, November 2008

^h INGENIA, Issue 31, Building Research Establishment, June 2007

ⁱ MORGAN, Chris, et al. “Overheating in Scotland: Lessons from 26 monitored low energy homes.” Proceedings of International Conference CISBAT 2015 Future Buildings and Districts Sustainability from Nano to Urban Scale. No. EPFL-CONF-213311. LESO-PB, EPFL, 2015.

^j Clear C and De Saulles T (2007) “Recarbonation Scoping Study”, British Cement Association

Question 3. The appropriateness of the timescales over which the proposals and policies within the draft RPP3 are expected to take effect?

14. As set out above, 70% of the direct emissions from cement production are unavoidable process emissions. The only technology that will enable a considerable reduction in these emissions is Carbon Capture and Storage/Use (CCSU). RPP3 acknowledges that this is a critical technology to further industrial emission reductions and the Scottish Government offers support for businesses trying to access EU funding. However, in order to meet the timescales set out in RPP3 of having a commercial scale CCSU demonstration plant by 2030, MPA members need firm commitments and not just offers of support. The cement roadmap action plan has over 50 tasks that together aim to deeply decarbonise the cement sector. MPA calls on the Scottish Government to commit funding towards the needs set out in the roadmap action plans and, together with the other devolved administrations, help form expert groups that can deliver on cross sector actions, for example, studies into CO₂ transport and storage.

Question 4. The extent to which the proposals and policies reflect considerations about behaviour change and opportunities to secure wider benefits (e.g. environmental, financial and health) from specific interventions in particular sectors.

15. Behaviour changes are the most difficult to achieve. In general, the public do not make the best environmental choices when it comes to their own homes. The reduction in carbon emissions from residential housing is likely to be greater when the solution is designed into the building rather than relying on the occupant to act. As stated in the answer to question 2 above, the high thermal mass of concrete stores heat and releases it slowly. This reduces both diurnal and annual fluctuations in temperature within a building, which in turn reduces the need for the public to switch on the heating or air conditioning to account for these fluctuations. If a building doesn't feel too cold on entry in winter it is less likely that the first thing to be switched on is the heating. The introduction of policies that state a minimum amount of thermal mass in new buildings could remove some of the need for heating and cooling to balance temperature fluctuations. By removing the need for the public to run a building inefficiently, you remove the need for behavioural change, which is much more difficult to achieve, but the end result is still a reduction in carbon emissions and improved thermal comfort.
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