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Public Consultation on the Circular Economy

Consultation response **August 2015**

Overview

There are strong environmental imperatives for reducing CO2 and the circular economy can play a critical role in delivering on emissions targets. A great deal has already been done to develop circular business models, such as offering products as a service, that enable end of life recycling and reduce waste. However, improvements in circular manufacturing and energy generation have not progressed at the same rate across the board and certain industries and sectors have yet to implement best practices in this regard. Applying the principles of the circular economy to carbon emissions can result in cost effective environmental benefits whether through the re-use of waste CO2 as a new product resulting in permanent capture and storage or through displacing the need to extract and consume additional fossil carbon resources.

About Sandbag

Sandbag is a UK-based not-for-profit think tank conducting research and campaigning for environmentally effective climate policies.

Our research focus includes the phase-out of old coal in Europe; deep decarbonisation of industry through technologies including Carbon Capture Utilisation & Storage; reform of the EU Emissions Trading Scheme; and increasing ambition in the EU 2020 and 2030 climate & energy packages.

For more information visit www.sandbag.org.uk or email us at info@sandbag.org.uk

This document provides our view of the role that carbon dioxide feedstocks can have in realising the circular economy. It also includes an overview of existing policies affecting the energy and mineralisation industries and Sandbag's recommendations for the objectives of future policy measures to support the wider adoption of carbon feedstocks in the EU.

Target areas for circular economy

Carbon capture & storage (for energy and industrial sectors)

At present, conventional fossil fuel energy plants along with many industrial facilities operate a linear process; converting fuel or feedstock inputs into energy, products and disposable waste streams, the latter of which are vented to the atmosphere. However, the need to reduce CO2 emissions on a global scale to mitigate the damaging effects of climate change means that the BAU case for fossil power is neither sustainable nor politically viable in the medium or long term. However there remain cheap, secure and abundant sources of fossil fuels. Renewable energy sources, though capable of offsetting carbon emissions, cannot provide a stable baseload or directly replace some industrial fossil based processes. Electrification can help, however the cost implications of this have yet to be fully explored. Progress in developing scalable closed-loop energy solutions involving carbon capture have to date been hampered by a carbon price that underprices the costs of CO2-driven climate change. In many circles abating CO2 is seen as purely a liability and not yet as a business opportunity. As such, there is a growing risk that industry with high process emissions will either close or move out from under legally binding caps or stay and seek to undermine the meeting of emissions reductions targets and climate ambition more generally.

Carbon capture and storage and use (CCSU) offers a way of directly reducing emissions on a large scale at the lowest possible cost, providing an effective means of closing the carbon loop. However, policy mechanisms designed to support CCSU technologies have not led to sufficient numbers of projects being developed. Notably the NER300 fund, which was intended to support CCS but had grant requirements that effectively disqualified otherwise propitious candidate CCS projects.

Member State governments have been hesitant to give a clear commitment to supporting CCSU and to guide the development of associated transportation and storage infrastructure.

The circular economy and mineralisation

Mineral carbonation is one of a suite of technologies that fall under the umbrella term 'carbon capture and storage & usage' (CCSU). There are an increasing number of mineral production facilities in Europe that engineer a process of accelerated weathering; reacting a range of industrial waste streams with carbon dioxide to produce inert carbonate materials, which are then sold on to the construction sector. This processes has been shown to be viable on a commercial scale and capable of providing long-term skilled employment. Crucially, it helps divert hazardous wastes away from landfill while preventing carbon dioxide from entering the atmosphere. The final products, which have applications in construction materials, are non-hazardous and have a negative carbon footprint thereby offering significantly greater environmental and climatic benefits compared to conventional building products.

A number of carbonation processes use hazardous wastes (such as incinerator ash, cement bypass dust, contaminated soils and steelmaking sludge) as feedstock. Restrictions on the movement of hazardous wastes in the EU (Waste Framework Directive 2008/98/EC) permit the transport of small samples of hazardous material across borders. Although small quantities are sufficient for the purpose of lab testing, larger quantities of material are generally required for industrial scale mineralisation performance testing (typically several tonnes). Current licensing rules can act to impede the latter, particularly where a Member State's laws governing the reclassification of hazardous wastes (i.e. changing the status of wastes to enable them to be transported for use as feedstock) are inflexible.

Existing incentives to recycle construction materials and reduce construction and demolition waste (CDW) have not produced favourable results; less than 50% of building materials are recycled[1] despite the majority of CDW being suitable for recycling. There has been limited support for the use of low-carbon building materials and non-extracted construction minerals - such as building aggregate produced via the mineralisation process - which helps to mitigate the carbon footprint and environmental impact of urban development.

Furthermore, new construction materials are only considered acceptable for use in mainstream building works once codes of practice have been updated to certify them, a process which involves rigorous testing to assess their performance and safety. There are currently many barriers to new products entering the market and few or no incentives. This is a concern since CO2 emissions from cement-making in the EU have risen in recent years, setting the industry on course for emissions levels that are several times 2050 targets.[2] A balance must be struck between enforcing high standards of construction and reducing hurdles that delay best available technology for emissions reductions in becoming available to the market. Relying on the existing approach will result in fewer green innovations being brought to the market and a pace of emissions reductions that will fail to achieve 2050 targets for the cement industry by a wide margin.

Policy objectives for Circular Economy

In view of the challenges faced in realising a circular economy in the energy generation and industrial sectors, Sandbag recommends policies to tackle issues to do with investment and risk allocation for CCSU.

CO2 emissions from fossil fuel burning and industrial processes contribute most to anthropogenic global warming. Yet these fuels are abundant, secure and cheap. CCSU is, for the foreseeable future, an important means of closing the carbon loop in these circumstances. It is widely understood that CCSU must be deployed on a large scale – both for energy and industry – in order for it to become cost-effective. This means completing existing pilot projects whilst putting in place the infrastructure and support mechanisms for future CCS development. Doing so requires a commitment to long-term investment and appropriate risk sharing between government and the private sector. Without a higher carbon price, first-of-a-kind CCS projects cannot proceed without EU and MS funding support. Similarly, commercial CCS projects will require access to government funded incentive schemes such as Contracts for

[1] BIO Intelligence Service. 2011. Management Of Construction And Demolition Waste – SR1: Final Report Task 2 (link)
[2] Ecocem. 2013. A Carbon Reduction Roadmap for the Cement and Concrete Sector in Ireland (link)

Difference, at least until additional operation, transport and storage costs become comparable to the costs of emitting. In consideration of the investment that has already been made in developing CCS, the willingness of operators to adopt the technology and the absence of an alternative means to significantly reduce emissions, Sandbag recommends that EU policy on the circular economy includes measures to overcome the financial and regulatory hurdles to CO2 usage or disposal via CCSU. This would include a strategy for financing carbon capture projects and associated transport and storage infrastructure. It would also require government to set out a clear approach to risk allocation and legal obligations.

For the construction sector, Sandbag advocates a policy approach that balances support for industrial utilisation of waste streams (particularly where their processes can neutralise hazardous minerals) while pushing for developers to adopt low-carbon building practices where practicable.

Circularity in the construction sector also requires that Members States take a flexible approach to waste designation and innovation in waste management, driving policy mechanisms to reduce disposal and facilitating projects of common interest for waste management. Movement restrictions placed on certain types of waste should be reviewed and harmonised across Member States as new processes (in mineralisation, cement-making, plastic manufacture, etc…) mean that many waste streams from industrial sources now have potential for reuse in other supply chains or products. Policy incentives, while key to promoting mineralisation and other carbon mitigation technologies, must be structured in a way that enables – not dictates – research and development into cleantech.

Summary

To achieve greater circularity – both in terms waste management and carbon recycling – we recommend that waste management policy in the carbon and construction markets is reviewed in order to remove barriers that prevent low-carbon innovations being adopted in mainstream markets and products. Helping markets move away from BAU practices and adapt to low-carbon products will also require governments to support circular business models. Finally, large-scale projects to close the carbon loop, such as CCS, will only attract finance once a legally binding public-private risk allocation has been established.

About this briefing

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