

Submission on Waste Action Plan for a Circular Economy

Cement Manufacturers Ireland

Cement Manufacturers Ireland (CMI) was established in Ibec in 2003 and has three members in the Republic of Ireland; Irish Cement, Breedon Cement and Quinn Cement, and an associate member in Northern Ireland - Lafarge Cement.

The cement industry is an indigenous manufacturing industry with a long heritage, providing local employment, maximising resource efficiency and producing high quality cement products. Our cement is the essential foundation of Ireland's current building stock and a critical element in a future vibrant and sustainable built environment.

Our member companies operate modern manufacturing facilities to the highest international and European standards supporting over 2,000 direct and indirect jobs in Ireland. The members compete on the island of Ireland to supply cement products to the domestic construction market and are also involved in the export of cement products to other European markets.

CMI is a member of Cembureau, the European Cement Association and an Associate Member of the Global Cement and Concrete Association.

An introduction to modern cement manufacturing

Cement manufacturing is a large-scale, energy intensive activity that transforms natural raw materials into cement powder which is essential for virtually every construction project. Our members are continuously investing in upgrades and improvements and today Ireland has modern energy efficient cement factories operating to European Best Available Technology (BAT) standards. Ireland's construction sector benefits from more sustainable local cement products as a result of three primary cement industry initiatives and investments:

1. **Energy efficiency investments** – cement plants operating to BAT ensures we use less energy today to make cement
2. **Fossil fuel replacement** – 3 cement factories have active programmes using alternative fuels in place of fossil fuels which directly improves the circularity of the production process and provides wider benefits as we recovery energy and recycle key elements from society's discarded resources
3. **Clinker substitution** – in the manufacture of CEM II cements the clinker content is reduced in line with the European Cement Standards; this allows for the replacement of virgin raw materials with alternative materials and by-products from other industries

Taken together, these initiatives have reduced the emissions per tonne of cement in the Republic of Ireland by approximately 17% compared to 1990 levels. This is in line with the European ambition to transition to a low-carbon circular economy.

Fossil Fuel replacement provides the clearest example of our contribution to the circular economy. In 2019, over 250,000 tonnes of alternative fuels made from local residual waste was used to fuel 3 cement kilns in Ireland. This not only displaces imported fossil fuels but also directly contributes to the circular economy by recovering value from discarded resources (see 'hidden recycling' case study below). Subject to suitable quality and availability, the replacement of fossil fuels is set to substantially increase over the coming years as part of long-term programmes to further improve the sustainability of our cement products.

Work is also underway within the industry to investigate new production methods and the use of additional alternative raw materials, all with a view to improving resource efficiency. Throughout Europe a number of innovative projects are showing promise and the challenge for the sector will be to prove the technical and commercial viability of these innovations.

The cement industry, because of the scale of its operations and the inherent high temperatures needed for the manufacturing process, is well positioned to assist further with Ireland's transition to a more circular economy. Our members recognise the challenge and our responsibility to use natural resources as efficiently as possible as we play our role in constructing Ireland's built environment.

Response to this consultation

CMI welcomes the opportunity to provide a response to the public consultation **Waste Action Plan for a Circular Economy**. Our response is set out below in two parts; the first part provides a short position on cement, concrete and the circular economy. CMI recently produced a short animated video titled *cement, concrete and the circular economy* which can be viewed via the following link <https://vimeo.com/179041902>

The second part of our submission responds directly to a number of the questions posed in the consultation documentation. CMI has confined its responses to questions that are directly relevant to cement, concrete and the broader construction sector.

Part 1 – cement, concrete and the circular economy

We would like to propose two key topics for consideration in the Waste Action Plan;

- 1. How to maximise the potential of our cement kilns to assist with Ireland's current and future waste management challenges; and ensure that suitable discarded resources are beneficially recovered and recycled as part of the cement manufacturing process**
- 2. How can the Waste Action Plan incentivise higher levels of reuse and recycling of concrete**

Maximise the waste recovery potential of our cement kilns

Closing the loop, an EU action plan for the circular economy (2015), identifies increasing waste prevention, reuse and recycling as key objectives of their Action Plan. Uniquely the cement industry, as a manufacturing industry where extreme temperatures are vital, is already playing an important role in recovering some of society's discarded resources by returning these materials back into the economic cycle.

Today the members of CMI use alternative fuels made from non-recyclable waste to replace an average of 36% of the fossil fuels needed to generate the heat for the cement manufacturing process. This directly reduces the need for imported fossil fuels and our members have ambitions to further reduce their fossil fuel consumption.

There is an inherent tension for many people between the need to increase recycling rates and using waste materials to generate heat in industrial processes, like cement manufacturing. Acknowledging that not all waste can be recycled and that the cement industry can play an important role is outlined in the European Commission's 2017 ***Communication on the role of waste to energy in the circular economy***. The Communication advises that when Member States are reviewing waste management plans and examining the need for *'additional waste-to-energy capacity for the*

treatment of non-recyclable waste' that they should assess, among other things, 'the available capacity for co-incineration in combustion plants and in cement and lime kilns or in other suitable industrial processes;'

The Commission study included *co-incineration in cement and lime production: among 'the best proven techniques to increase energy efficiency'*. The document also identified that more consideration should be given to processes with material and energy recovery and that *'promoting those processes which combine material and energy recovery can contribute to decarbonising key sectors...'*

When waste is used to heat the cement kiln to produce clinker (the intermediate product of cement), the organic component of the waste provides the heat needed inside the kiln and the mineral or 'non-combustible' elements become part of the cement clinker. The combination of these two parallel processes is called "co-processing". The potential of co-processing should be enhanced further through legislative and regulatory measures that recognise this form of material recycling and its contribution towards recycling targets and the achievement of real circular flows for discarded resources. The following case study will help to illustrate this 'hidden recycling'.

Case Study - Hidden recycling

Each year Irish Cement's Platin factory, like virtually all cement factories must source external supplies of alumina, an essential ingredient in the manufacture of cement clinker. Typically bauxite is the primary source of alumina and this is transported to the site. While alumina is a minor ingredient in cement manufacture, at the scale of materials handling in cement factories, substantial quantities of alumina are required each year. Since 2011, when Platin first started replacing fossil fuels with Solid Recovered Fuel (SRF) it has been able to reduce the importation and delivery of bauxite by approximately 40,000 tonnes; an additional benefit to the primary goal of replacing fossil fuels.

SRF is made from non-recyclable waste materials like paper, plastic and composite packaging. Close to 2% of the SRF used in Platin contains non-recyclable aluminium, primarily from composite packaging, (for example crisp packets and packaging for coffee). The SRF is used primarily for its energy content, however the non-combustible or mineral fraction of the SRF, in this case the alumina, which is released at high temperatures inside the cement kiln, provides a useful addition to the raw materials needed for cement clinker production.

The alumina contained in the SRF substitutes for a portion of the imported bauxite. At an elemental level the aluminium in the SRF is recycled and allows Platin to reduce its requirement for bauxite, reducing the associated quarrying and transport impacts. It is a real-life example of the circular economy in action, where discarded resources are recycled back instead of using virgin resources.

This type of 'hidden recycling' is being increasingly recognised around Europe with a number of Member States working to assess its contribution to their national recycling targets.

Fossil fuel replacement using alternative fuels continues to be a priority for our members. We were pleased to see this recognised in the Department's 2019 ***Climate Action Plan***. However the 2030 target of 80% fossil fuel replacement in Ireland's cement kilns is a stretch

target. This will only be achieved if fuels of a suitable quality are available and the practice gains greater acceptance from the regulators and the public. Our member companies recognise that they too have a responsibility to provide information on the many benefits of co-processing in cement kilns. Not only the direct reductions in carbon dioxide emissions; but the fact that the cement industry is helping to divert waste materials from landfill, provide a recovery option for 'non-recyclable' waste, and in fact contribute to national recycling targets.

To continue to expand the range and quantity of alternative fuels permitted for use in cement kilns, new regulatory and licencing approvals may be necessary. It is essential that the States' Regulatory Bodies receive appropriate resourcing to allow them to undertake their responsibilities efficiently and effectively to ensure obstacles and delays are avoided. They should also be supported in their work by appropriate policy instruments at a national level that reinforce the circular economy principles of valuing resources appropriately and encouraging them to be maintained in the economy for as long as possible.

Reuse and recycling of concrete

Cement is the key ingredient in concrete, and concrete is the second most used substance on the planet after water. For such a common material, its use in for example housing, transport and infrastructure projects, is very often overlooked and taken for granted. The Irish concrete industry and our indigenous cement factories are well placed with sufficient capacity and resources to supply the anticipated upturn in residential construction and the on-going investment in infrastructure. Ireland is blessed with suitable natural resources to create a modern vibrant built environment with comfortable homes and a good quality of life for all. What is needed is a greater understanding of the cement and concrete value chain; in particular the fact that concrete is a local, resource-efficient material that is 100% recyclable. Our members would contend that cement and concrete are integral to the development of a circular economy in Ireland.

Closing the loop, stressed that the transition to a more circular economy requires action throughout a product's life-cycle: from production to the creation of markets for 'secondary' (i.e. waste-derived) raw materials. The EU Action Plan also outlined a number of fundamental features that should be associated with circular products; ***'durability, reparability, availability and affordability'***. Cement gives concrete its strength and durability. Properly designed concrete buildings can last many lifetimes and in many senses concrete structures define **durability**; think of Ardnacrusha Hydroelectric station in County Clare which was constructed using concrete back in the late 1920's and today still supplies electricity to the grid.

Concrete is a remarkably resilient material that can be renovated and repaired. Throughout our built environment there are multiple examples of concrete which has been repaired allowing the structure to continue providing services to society. Due to exposure to harsh

marine environments many of Ireland's concrete sea-walls and defences have been repaired and supplemented over the years to provide additional protection to vulnerable low-lying areas along the coast.

Concrete is locally **available** throughout the length and breadth of the country and Ireland is blessed with an abundance of the natural resources essential for the production of concrete. The materials manufacturing sector here has invested in the technology and techniques to produce consistent high quality concrete products and the construction industry has the expertise and experience to deliver excellence in our built environment.

A report on ***House Building Costs and Costs of Quarried and Concrete Materials*** by the Irish Concrete Federation in 2016 demonstrated that the concrete products and quarried materials used in the construction of a standard three bedroomed semi-detached house accounted 'for less than 4% of total build costs'. In Ireland concrete is a dependable and **affordable** construction material that is ideally suited to the Irish climate.

From a 'resource-efficiency' point of view concrete is **fully recyclable**, as aggregates into fresh concrete or other construction projects, or in some cases back into the cement production process. With proper consideration at the design stage concrete structures can be designed to be repurposed and concrete elements can be reused in new buildings.

In every sense concrete meets the requirements of circular products set out in the EU Action Plan and is a key enabler to accelerate the move to a more circular construction sector. The new Waste Action Plan should encourage maintenance, repair, reuse and recycling of construction materials like concrete. However, a "mandatory recycled content" target would not work for concrete as the supply does not match the demand, particularly in rural areas. It would also not always be effective from a technical and environmental point of view. Instead, the focus should be on a performance-based policy for the use of recycled material from construction and demolition (C&D) Waste.

Closing the loop the EU Action Plan outlines the importance of agreeing reliable indicators to establish a simple and effective monitoring framework to track progress towards a circular economy. The key benefits of concrete described above should be viewed over the whole life of the building and be based on a life-cycle approach such as the EU's new **Level(s) framework** which provides appropriate rules for life-cycle assessment of buildings.

Collaboration across the construction sector

There is broad agreement that the scale of the transition to a more circular economy requires action right across all sectors of enterprise and society. In the construction sector long time periods are required to cycle resources from extraction through manufacturing, construction, operation and end of life back to the beginning of the process. Therefore all the participants across the whole construction value chain need to be committed to achieving the same life-cycle outcomes and resource efficiency goals.

The cement and concrete industry has a history of improved product performance and new innovations are underway that will further improve the durability, longevity and recyclability

of our buildings and infrastructure. As the industry brings these innovations to market it is important to emphasise the role of education and training of architects and engineers on the applicability of efficient design opportunities in buildings and infrastructure and the need to integrate re-use and recycling of concrete into all future structures. Parallel development of performance based standards should encourage the delivery of a future built environment that recognises the value of the resources in use and ensure the sector delivers maximum value to society from the efficient use of resources.

Part 2 – responses to selected consultation questions

2. Consultation Questions - Institutional Arrangements

1. How are the current institutional waste prevention and management arrangements working and how could they be improved in your opinion?

One example of what is working well in this area is the cross-sectorial working groups hosted by the DCCAIE that facilitate information sharing and co-operation among stakeholders. This model could also be used to help with implementing the transition to a circular economy.

One area of frustration for many operators is the slow pace of licencing and planning applications. Additional resources are needed by the Environmental Protection Agency and An Bord Pleanála to efficiently process applications that have regional and national significance, including a more streamlined and systematic approach to 'by-product' and 'end of life' assessments and decisions.

2. Have you any other comments or suggestions on how you would like to see Ireland transition to a more resource efficient and circular economy by improving our waste management practices?

A coordinated national policy will be required to assess the value of resources in a circular economy. To progressively improve our economy's resource efficiency, a better understanding of material flows within the economy will be necessary. By mapping how and where resources are used, opportunities for collaboration and industrial symbiosis will arise. This exercise will also identify any infrastructure gaps.

Work needs to be undertaken to establish, through a comprehensive life-cycle assessment approach, the real benefits and the limitations of recycling so called 'hard to recycle' materials. Establishing clear guidance on the best environmental outcomes for all significant material flows in the economy could assist all the decision making bodies and ensure Ireland can maximise the value of waste streams and ensure a more rapid transition to a resource efficient economy.

In addition, given the challenges of meeting our national recycling targets recognition of the recycling aspect of co-processing in cement kilns should also be a priority.

7 Consultation Questions – Circular Economy

1. What are the areas with greatest potential for transformation in Ireland under the Circular Economy?

Utilising Ireland's cement kilns for waste recovery and recycling is already yielding significant benefits for 'non-recyclable' materials. The Waste Action Plan should endorse co-processing to ensure the full potential of Ireland's cement kilns is maximised. The added benefit of this circular economy initiative is that fossil fuel consumption by the industry will reduce.

Improve the approach to C&D waste by providing clarity around 'by-product' and 'end of waste' classifications for the sector. Establish a clear set of metrics and reporting criteria for re-use and recycling of C&D materials from significant construction activities. Any new policies must use a material neutral and performance-based approach that considers the whole life-cycle to leverage the entire construction value chain. There will be no long-term benefit to Ireland if we simply import quick solutions, we must encourage indigenous innovation based on our own natural resources and ingenuity.

2. What measures are required to increase understanding of Circular Economy principles and their uptake by relevant actors?

For all householders develop a simple practical 'toolbox' of actions that empowers citizens to make informed purchasing decisions and helps them to redirect discarded resources back into the value chain. This needs to be backed up with the right infrastructure and supports and a well-funded education campaign.

Because we are embarking on a multi-generational project, 'Circular Economy' should be on the curriculum in all schools, to build awareness and a sense of responsibility that, collectively, small actions across the whole population make an important contribution.

Establish an 'industrial symbiosis working group' to identify opportunities and establish best practice in turning the outputs from one sector into the raw material/energy supply for other sectors.

4. Have you any other comments or suggestions on how you would like to see Ireland transition to a more resource efficient and circular economy by improving our waste management practices?

Education and awareness of the best methods for processing each waste stream will help to inform and motivate citizens about their role in the circular economy. Currently waste management is a complex and confusing topic for most people. In simple terms, a well-functioning circular economy reduces or eliminates waste flows and maximises the value of resources already available within the economy by extending the life of products. The challenge then is to extract the value from waste streams when they arise. The use of alternative fuels in cement production is particularly effective in this regard, as the inherent high temperatures inside the cement kiln can unlock otherwise 'non-recyclable' elements and return them back into the economy while also efficiently recovering the energy content of the discarded resources.

A focus on product durability, reuse, repair, refurbishment and recycling is vital. Concrete as a building material fulfils all of these requirements so a greater focus on the resource efficiency of concrete construction should be incorporated into the Waste Action Plan. In this way fewer resources will be required for our buildings and infrastructure and the focus can then be directed to how to manage the remaining waste flows more effectively.

9. Consultation Questions – Construction and Demolition Waste

1. What other measures need to be put in place to encourage all players to prevent and recycle waste from construction?

Source segregation and having an agreed set of 'end of waste' specifications to be applied nationally for the full range of common C&D wastes would facilitate greater traceability and higher value recycling. Such certainty in the sector would also allow operators to invest in suitable infrastructure and systems to process these materials.

2. What existing measures are in place that could be improved?

Improve the assessment and tracking of C&D waste through a more efficient and responsive 'by-product' application process. Such improvements and clarity around 'end of waste' would allow the Waste Action Plan to more successfully leverage the infrastructure and expertise in Ireland's existing extractive industry to target suitably segregated C&D waste streams for processing and recycling.

3. What changes could be made to environmental and/or planning legislation to facilitate more recycling of construction waste?

The key requirement is for clarity around the classification of what is, or what is not considered waste. This certainty is required at a national level to ensure investment decisions can be made by the construction and waste industries to cater for the volumes of materials that should be re-directed into higher value applications.

4. What incentives could be introduced to increase the use of recycled materials?

A more efficient and responsive 'by-product' application process and clarity around 'end of waste' would allow, for example the existing market for recycled aggregates to flourish.

5. Should levies be applied to the use of virgin material where a recycled material is available as an alternative?

Given the scale of the construction sector and the volumes of materials required annually a levy on the use of virgin materials would not be effective. It is estimated for example that recycled aggregates would only be sufficient to supply 2-3% of the current market.

6. How can site managers be encouraged to ensure more on-site segregation? What financial incentives / penalties could be introduced to encourage better waste management practices?

Again the key to encouraging the market to function more effectively is to clarify the rules in relation to 'by-product' and 'end of waste' classifications and allow for the re-use of suitable excavation material on the originating site.

7. What are the best approaches to raising awareness and education?

Detailed assessment of material flows for the most common C&D materials to establish appropriate and realistic markets for recycled content in products.

Measurement and reporting following agreed national protocols would permit an increased awareness and allow for the introduction of industry best practice and C&D benchmarks based on industry best performers.

8. What are the barriers/enablers to these measures?

Currently a lack of education and enforcement mean that the industry is not incentivised to allocate resources to this task.

9. Have you any other comments or suggestions on how you would like to see Ireland transition to a more resource efficient and circular economy by improving our waste management practices?

The Plan should seek to maximise the value of the resources already used in our existing built environment by incentivising maintenance, repair and adaptation over demolition. When demolition of the structure is the only option the Plan must encourage re-use and high value recycling of every component by establishing a comprehensive assessment and reporting requirement for all substantial construction projects.

11. Consultation Questions – Waste Management Infrastructure

1. Should one national waste management plan be produced in place of the 3 current plans?

Yes, due to the relatively small size of the economy a collective approach should underpin future waste management planning. This will facilitate a collaborative approach to infrastructure investment and delivery of more effective systems for extracting the maximum value from waste materials. Many projects will only be viable if they can access sufficient feedstock or input volumes or markets, so taking a nationwide approach should ensure greater success.

2. Should the regional offices be set up on a statutory basis?

Yes, it would provide greater clarity of the role of the Regional Offices in any future planning and licencing process.

3. Should the State assist in funding the development of indigenous waste recycling facilities? If so, how should this be funded?

No, the state should provide the certainty around what is, or what is not a waste and the proper licencing and permitting supports should be in place so that the industry would then be able to invest in appropriate waste recycling facilities.

12. Consultation Questions – By-Products

1. How do you think the By-product process could be improved?

Additional resources are needed by the Environmental Protection Agency and An Bord Pleanála to efficiently process applications that have regional and national significance, including a more streamlined and systematic approach to 'by-product' and 'end of life' assessments and decisions.

2. Do you support the introduction of fees to assess by-product notifications?

Yes, we recognise the need to allocate additional resources to the Agencies charged with making by-product decisions so the introduction of fees would be a direct source of funding and also serve as a disincentive to speculative applications.

13 Consultation Questions – End of Waste

1. Should the Government seek to establish a group to apply for national End of Waste decisions for appropriate products e.g. Aggregates, Incinerator Bottom Ash?

We would be supportive of establishing a mechanism to ensure a consistent national approach to common 'end of waste' materials. While at the same time ensuring a high standard of environmental protection and monitoring and enforcement to discourage the activity of unscrupulous operators who could seek to take advantage of any such decisions.

2. If yes:

- what expertise would be necessary for such a team,

Industry specific experts, environmental regulators as well as those with enforcement experience

- who should be represented,

Industry, EPA, ABP, DCCA, DBEI, Regional Waste Management Offices

- are there other materials which you believe are suitable for national end of waste decisions?

All common C&D waste streams

18 Consultation Questions - Research & Innovation

1. What are the research areas you would consider to be important in developing a circular economy?

A coordinated national policy will be required to assess the value of resources in a circular economy. To progressively improve our economy's resource efficiency a better understanding of material flows within the economy will be necessary. By mapping how and where resources are used, opportunities for collaboration and industrial symbiosis will arise. This exercise will also identify any infrastructure gaps.

2. What new research programmes/initiatives do you think could be put in place?

Assessment of the contribution of co-processing in cement kilns to national recycling targets

Conclusion

As an essential building material, cement is key to the delivery of Ireland's future economic growth and development. Our members, in partnership with the full construction supply chain are committed to delivering a low-carbon and circular built environment for Ireland.

Our members would like to propose two key topics for consideration in the Waste Action Plan;

1. Maximise the potential of our members cement kilns to accept suitable discarded resources so that they can be beneficially recovered and recycled as part of the cement manufacturing process

2. Incentivise higher levels of reuse and recycling of concrete

The commitment of CMI members to substantially increase the use of waste derived fuels and raw materials in the manufacturing process presents an ideal opportunity for the Department in developing the Waste Action Plan. Our member's cement kilns provide reliable waste recovery outlets for non-recyclable materials and could also help Ireland achieve national recycling targets. Our members have already reduced average fossil fuel consumption by 36% and our motivation is to further drive down our dependence on imported fossil fuel. The Waste Action Plan should set out a path to help to build a better understanding of and support for co-processing to ensure Ireland can maximise this high temperature manufacturing process which allows the return of suitable discarded resources from society back into circular economic flows.

Local cement and the concrete it makes is a fundamental requirement for a modern vibrant economy. Concrete is a unique material, it delivers quality, durable structures at an affordable price to meet the needs of society. The value of the resources in the concrete is retained over the extended lifetime of, for example; our homes, schools, hospitals, factories, roads and harbours. Concrete is directly linked to the economic vibrancy of the economy. Ireland's Waste Action Plan for a Circular Economy should encourage the circularity of concrete to ensure the appropriate use of resources to fulfil society's needs in the most efficient manner and with the least impact on the environment.

We look forward to on-going engagement with the Department on how best our members can assist in the development of an ambitious and effective Waste Action Plan.