Global Cement and Concrete Association

Global Cement and Concrete Association

GCCA Policy Document on Circular Economy

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor,
2 Kingdom Street, London,
W2 6JP, United Kingdom

T +44 2035 804268

Position Statement

GCCA Members recognise the importance of applying circular economy principles at all stages of the lifecycle of cement and concrete. To this end we have incorporated key actions in the GCCA Charter and Guidelines, and circular economy is fundamental to the GCCA Climate Ambition Statement and the forthcoming GCCA 2050 Roadmap for carbon neutral concrete. In some countries circularity is already enabled through a supportive policy framework and the industry has responded with widespread implementation of initiatives. To maximise circularity globally, both in the sector and through the use of concrete, enabling policies, standards and regulations must become more widely adopted.

The cement and concrete sector already makes a significant contribution towards a circular economy by enabling the design of built environment assets that are long-lasting, resilient, low maintenance and can be repurposed. It also contributes through extensive use of recycled and secondary materials as raw materials and fuels in its manufacturing processes and products. Concrete is fully recyclable.

Society's need for homes, buildings and infrastructure outstrips the availability of material that can be reused from the current stock of material in the built environment. It is therefore paramount that where virgin materials are required, they are responsibly sourced, are able to be reused in a circular manner and are from stocks of materials that in themselves are plentiful, as is the case with limestone and other minerals used in cement and concrete manufacture.

GCCA Members believe that with an enabling waste and building policy regime and a collaborative approach across the construction value chain, there is significant potential to further enhance resource productivity and reduce carbon by application of whole life, circular approaches.

The GCCA and its members commit to:

- Accelerate the implementation of circular principles in cement and concrete manufacturing processes and product design by further improving production efficiencies, reducing waste and using recycled and secondary materials as raw materials and fuels, as described in GCCA guidelines and further guidance, GCCA's climate ambition and forthcoming GCCA 2050 Roadmap to carbon neutral concrete.
- Report GCCA Member progress on circular economy metrics,
- Innovate cement and concrete products and applications to enhance circularity,
- Collaborate to promote good circular practices, standards and enabling policies, and
- Encourage upfront circular design in the built environment, founded on a whole life, whole supply chain approach.

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor, 2 Kingdom Street, London, W2 6JP, United Kingdom

T +44 2035 804268

Global Cement and Concrete Association

Introduction

According to the World Economic Forum 100 billion tonnes of materials enter the global economy every year and this is growing[1]. These materials allow society to continue its way of life but their use has environmental consequences. Around half of these resources are currently being used in engineering and construction. Development in emerging economies, population growth and urbanisation require resources for buildings and infrastructure, as does intensification and refurbishment in developed economies. In housing alone, it has been estimated that by 2100 some 2 billion new homes must be built to keep up with global demand and these homes will require supporting infrastructure for vital services like transport, sanitation, clean water, and energy.

A circular economy approach is required to reduce this demand for resources by enhancing efficiency of manufacture and design, maximising lifetime of projects and elements, minimising waste and re-using waste. All of these are, and can be, increasingly applied to the cement and concrete lifecycle.

Definition of circular economy

The concept of circular economy is applicable to all industries, products and services and its application has the purpose of moving away from the 'take-make-use-dispose' model, to a circular model in which resource loops are:

- Closed – to divert waste from disposal and subsequent transformation into secondary raw materials,
- Slowed – to retain projects, products, and their constituent materials, in the economy for longer periods,
- Narrowed – to generate additional economic value from a fixed amount of natural resources.

The UNEP describes the circular economy in terms of nine "Re" actions[2]. The UNEP 9Rs Framework is designed to apply to all sectors of the economy, including short lived consumer products. For construction materials like cement and concrete, that are used to create long lasting built environment projects which themselves are constructed from many products, the 9Rs model can be adapted to map the "Re" actions into 6 categories according to the chronology of product manufacturing and use:

1. **Reduce by Design:** reduce the amount of material used.
2. **Recycle:** prevent waste disposal and allow material to re-enter the production loop.
3. **Repurpose** elements and components to same-or-better-than-new and place on market.
4. **Reuse** where possible.
5. **Refuse**: user buys or uses less; **Reduce**: use items and services for a longer time and buy them less frequently.
6. Repair rather than replace; **Refurbish** existing rather than replace; **Remanufacture** equipment or objects to same-or-better-than-new and return to customer.

[1] Circle Economy. Circularity Gap Report 2020. https://shiftingparadigms.nl/wp-contentuploads/2020/01/202001014-CGR-Global-report-web-spread-210×297-compressed.pdf

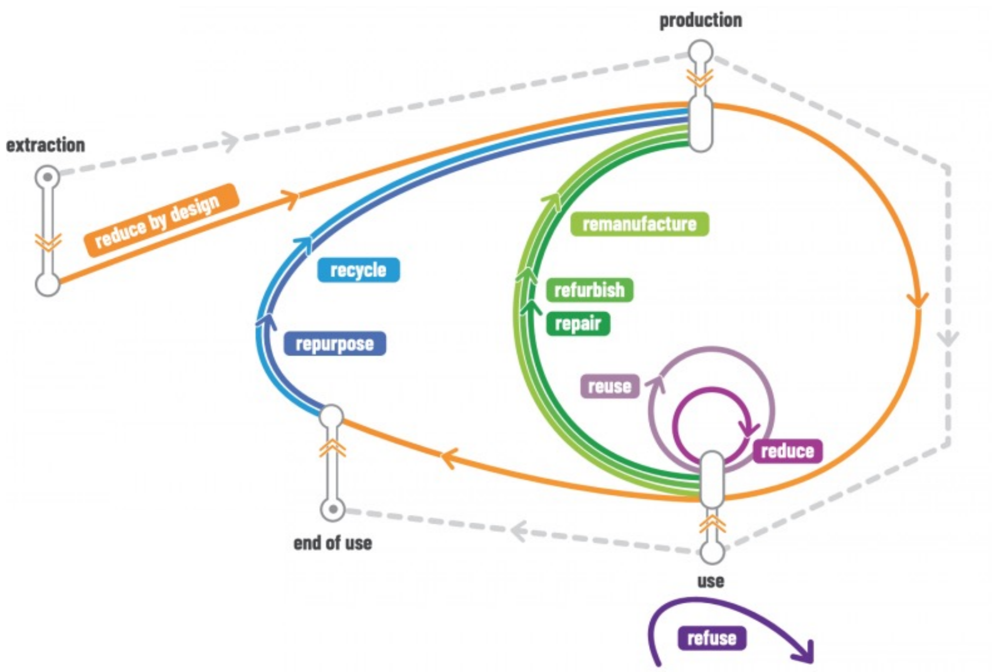
[2] United Nations Environment Programme (2019). UNEP circularity platform. www.unenvironment.org/circularity

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor, 2 Kingdom Street, London, W2 6JP, United Kingdom

T +44 2035 804268

The UNEP's "9Rs" circular economy[3]



Circular economy processes

Guiding principle | Linear economy model | Back to business

User to business | User to user

Cement and concrete's positive contribution to circular economy

Circular economy principles are already being applied throughout the lifecycle of concrete and the built environment assets it is used to create: from sourcing of raw materials and fuels, through manufacturing, design and use of concrete in projects, to reuse, repurposing and recycling at end of life. The UNEP "9Rs" Framework is used below to explain the current role of cement and concrete.

1. Reduce by Design

Upfront, purposeful design is key to achieving circularity, that is, circularity should be embedded into the earliest stage of the design process of construction projects and the products they are made from. In terms of design there are two distinct stages for concrete where "reduce by design" applies: in the product design and in how the product is used in project design.

Product Design

Concrete is a mixture of cement, aggregates, chemical admixtures, and water, and cement itself is a blend of materials, fundamental to which is Portland cement produced from grinding Portland clinker. The fact that it is a mixture and a blend enables manufacturers to optimise the recipe to deliver the necessary technical performance. It also permits recycled content to be optimised (see "Recycle" below).

[3] United Nations Environment Programme (2019). UNEP circularity platform Illustration. www.unenvironment.org/circularity

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor,
2 Kingdom Street, London,
W2 6JP, United Kingdom

T +44 2035 804268

Global Cement and Concrete Association

Project Design

In terms of project design, concrete is used to design, construct, and maintain safe, healthy, resilient, low carbon, high performance buildings and infrastructure assets that are adaptable to the changing needs of occupants over long periods.

Concrete's versatility allows designers to optimise circularity:

- Concrete can be cast in many shapes and forms and even with voids.
- Concrete can be cast in a factory or on site.
- Concrete can be reinforced and prestressed.

These versatility options enable manufacturers of concrete products and designers of concrete projects to optimise designs according to material use. This ability is further enhanced by optimising both the concrete material properties and design of the element within the same integrated design process.

Concrete's inherent properties can be exploited by designers to optimise circularity:

- Longevity – concrete can be designed to last for long periods, with many examples lasting hundreds of years.
- Resilience to fire, moisture, and pests– concrete's resilience can be used to minimise maintenance needs and reduce the need for the treatments needed by other construction materials, such as fire-retardants and preservatives.
- Acoustic performance – concrete's density means that it reduces noise transmission between spaces thus avoiding or minimising additional acoustic finishes. This saves resources on initial build and during project refurbishments.
- Thermal mass – concrete's thermal mass can be utilised to reduce the need for heating, ventilation and air conditioning systems thus saving resources at initial build and the ongoing energy these systems demand. The thermal mass can also be a key parameter in ensuring whole concrete frames are reused at end of first life, as it enables a low energy solution for the second life of a project.

Concrete's range of durable self-finishes allow designers to reduce the need for other materials like plasterboard and ceiling tiles:

- Concrete takes the shape and relief of whatever surface it is cast against – patterns, texture and even photographic images are possible
- Concrete can be coloured with pigments
- Concrete surfaces can have exposed aggregates providing different aesthetics.

Global Cement and Concrete Association

2. Recycle

Throughout the lifecycle of cement and concrete, recycling is exploited to minimise use of raw materials.

Clinker Production

The co-processing (Box Out 1) of waste and secondary materials as alternative fuels, and their use as alternative raw materials (ARM) (Box Out 2) in clinker manufacturing, is a longstanding contribution of the sector towards a circular economy. Use of alternative fuels and ARMs replaces fossil fuels and primary raw materials in the clinker production process and provides an important service to communities in making beneficial use of a range of society's waste and by-products which would otherwise have been disposed of.

Significant advances have also been made in the recycling of the sector's own waste streams. For example, Cement Kiln Dust (CKD) including by-pass dust, which is captured in the cement plant dust abatement systems, can now be 100% recycled in the cement manufacturing process or used for a wide range of other applications.

Cement and Concrete

A range of different cement types are produced by blending or inter-grinding clinker with a variety of alternative materials, including industrial by-products, referred to as supplementary cementitious materials (SCMs) (Box Out 3). The addition of SCMs can be made either at the cement plant or the concrete plant and their application is dependent on the local availability and supply of these materials. The components that make up the cement and concrete have an impact on their properties, so standards determine the type and proportion of alternative main constituents that can be used.

The use of SCMs makes a major contribution to the use of industrial by-products thereby offering a zero landfill solution to those generating these materials. SCMs can significantly lower the carbon footprint of the cement and concrete, and also allows the production of a wide range of cements and concretes with properties specifically designed for particular applications.

Concrete and Aggregates

Concrete is fully recyclable. Returned loads and precast components can be recycled back into new concrete. End of first life concrete can be processed to produce quality controlled recycled concrete aggregates (Box Out 4) that can be used to replace primary aggregates in concrete or in other unbound aggregate applications. Concrete can also be designed to incorporate general recycled aggregates.

In terms of circularity and conservation of resources, it is to be noted that it is often better to use recycled aggregates for non-concrete applications where they still replace primary aggregates, and to use primary aggregates in concrete to maintain efficient concrete mix design. The concrete industry is best placed to assess this on a case-by-case basis, taking into account factors such as travel distances. It is beneficial that many codes and standards already allow recycled aggregate content in concrete so that the industry have both options available – recycled and primary aggregates. It is also to be noted that primary aggregates are widely available and efficiently produced, and are typically locally available so that travel distances, and hence impacts, are minimised.

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor,
2 Kingdom Street, London,
W2 6JP, United Kingdom

T +44 2035 804268

Global Cement and Concrete Association

3. Repurpose

For the concrete sector, the "Repurpose" action is chosen to refer to elements and components (for repurpose of buildings and assets see "Reuse").

Concrete's longevity, durability, mechanical and fire resistance, global availability, variety of type and form, and flexibility in design and application, enables components to be reused and give it significant potential to be specifically designed to be disassembled and reused in other projects. Examples include a wide variety of factory-produced concrete systems, based on blocks, slabs, panels or full modular designs, where the components or even whole rooms are fixed together onsite. Whilst there are many other examples of temporary structures, the built environment is mainly made up of long-term assets such as homes, schools, hospitals, commercial buildings, and infrastructure which are more economically repurposed at project scale rather than element by element, and for this see "Reuse".

4. Reuse

For the concrete sector, the "Reuse" action is chosen to apply at the building/ infrastructure level (for reuse of elements and components see "Repurpose").

Buildings with durable and robust structures can be reused. The first life of a building is often designed to be 50 years and it is typical for partitions, ceilings, heating, cooling and even façades to be fully stripped out and replaced on perhaps 10-, 20- and 25-year replacement rates respectively, but for the durable and robust structure to be retained. Concrete structures are inherently suitable for repurposing through their longevity, low maintenance and resilience to flood, fire, rot, and infestation. Of increasing importance in terms of circular economy is up front design to extend the life beyond 50 years when demolition and rebuild has typically been the more likely option. This is "Reuse" at a project scale.

This "Reuse" at project level is also referred to as deep retrofit (or in some regions as refurbishment). Concrete structures are well suited to enable this because as a material it is resilient, durable, and robust but also because structurally, concrete buildings typically have a characteristic called structural redundancy. This makes them suited, or more easily able, to be modified to support/house an alternative building function.

When reused, concrete frames, especially the concrete floors and walls can be exploited for their thermal mass, and when evaluating potential for reuse of the structural frame, this is an important additional positive benefit. Through exploiting thermal mass of the re-used frame, operational costs, carbon impacts and material impacts can be minimised by minimising mechanical heating and cooling. This is also a good example of "reduce by design".

Buildings designed now can be intentionally designed as "long life loose fit", a flexible approach, so that a future reuse is more likely to be possible. The flexible design approach enables the structural frame to stay in valuable use while allowing internal spaces and external facades to be changed as requirements and even fashions change. For example, in schools, vertical structure can be arranged along facades and corridors and not between classrooms, so that if classroom sizes change in future, separating walls can be moved (as they are not structural). Or if the school changes function altogether, once again separating walls can be easily moved. These design features can be incorporated with all structural materials, but the benefit of the long life can only be manifested through use of structural materials that are inherently robust and resilient like concrete.

Registered office:
Paddington Central, 6th Floor, 2 Kingdom Street, London, W2 6JP, United Kingdom

T +44 2035 804268

Global Cement and Concrete Association

5. Refuse, Reduce

Client decisions about building less – "refusing a product" – or choosing to use assets for longer – "reducing demand" – have in the past been driven by commercial considerations. Increasingly sustainability, and circular economy more specifically, are influencing such decisions. Society is aware of the need for stewardship of resources, and hence clients should ensure that projects, and elements of projects, are needed and are conceived in a manner that utilizes resources efficiently. Like all companies committed to sustainability, GCCA members in their own businesses implement and commit to these principles.

Reduction of waste during the process of construction is an important consideration. The versatility of concrete as a material means that there are a wide range of construction methods that can be selected according to site specific circumstances – from factory made concrete masonry being laid on site by hand or robots – to industrially mixed concrete being poured in-situ on a project site into a bespoke mould precisely to the exact geometry. The versatility of concrete, together with the right incentives for contractors, can result in minimised site waste and avoidance of additional materials.

Concrete's durability reduces the need for additional materials for replacement or repair and concrete can be more than structure (serving multiple functions such as structure, fire separation and thermal store), thereby reducing the need for materials that would be needed if building from other structural materials like steel or timber. This is expanded in item 1 "Reduce by Design", subsection "Project Design".

6. Remanufacture, Refurbish, Repair

These three "Re" actions in the UNEP Framework apply to products going back to the production location. This does not typically occur for the built environment in general because of the long lifetime of projects and the site/project specific nature of most projects. For concrete, because concrete and concrete products are durable and robust and they are incorporated into the building works, return to place of production is not typical now but may become a pragmatic strategy in the future. Of more impact will be greater application of "Reuse" of projects in situ.

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor,
2 Kingdom Street, London,
W2 6JP, United Kingdom

T +44 2035 804268

Furthering Concrete's Positive contribution

The GCCA believes that products and built environment assets should be designed and built to last as long as possible, and to be repaired, refurbished, disassembled, and reused. Components and their materials should be maintained at the highest useful purpose for as long as possible to minimise waste.

Cement and concrete already contribute significantly to the circular economy, and in the coming years can make an increasing contribution through all life cycle stages: manufacturing, design and use of the material and at end of life.

Manufacturing

In manufacturing, the key areas where the industry is, and will, further its contribution to the circular economy are through reduced use of primary input materials, replacing them with waste and secondary materials from other sectors. This is through "Reduce by Design" and "Recycling" actions to use these materials as alternative fuels, ARMs or as constituents of cement and concrete, depending on their properties. Alternative fuels and ARMs must meet quality specifications in the same way as conventional fuels and raw materials. More specifically:

- *Clinker*: Co-processing (Box Out 1) is one of the key levers identified in the GCCA Climate Ambition Statement for carbon neutral concrete. It will contribute to decarbonisation but also to a circular economy. The industry is committed to increasing its co-processing, and to do so requires regulatory support to access and use suitable waste materials.
- Further increase the identification and use of wastes and secondary materials that are suitable for use as ARMs to replace primary raw materials in the clinker manufacturing stage of cement production.
- In locations where this is not already being undertaken, the sector may recycle cement manufacturing waste streams, such as Cement Kiln Dust (CKD) and Kiln Bypass Dust, either in the cement making process or use it for a wide range of other offsite applications.
- *Cement and concrete*: Use of SCMs either in factory made cements or as combinations with cements in the concrete plant (Box Out 2) is established in material standards and construction practice in many parts of the world. The industry is committed to maximising the use of SCMs but to do so requires client support in specification requirements – traditional specifications sometimes exclude SCMs. The sector can also further optimise the circularity of concrete formulations through use of speciality concrete admixtures to optimise components, facilitate lean designs and enable efficient use of materials during construction and use phases.
- *Concrete*: Recycled aggregates (Box Out 3) can be used to replace virgin aggregates in general and also specifically in concrete. Codes, standards, and client specification should allow recycled aggregates to be used in concrete.

Global Cement and Concrete Association

Design and Use

Designers can utilise the material efficiency opportunities that concrete affords them by introducing total material demand as a key design criterion, alongside the traditional criteria of cost and speed of construction. Early engagement with material suppliers and contractors, and use of digital technology including BIM, are further enablers to optimising circularity.

The versatility of concrete already enables design optimisation, and this will be furthered with new solutions targeted at delivering material savings.

Designers can choose to utilise concrete's performance benefits over and above its structural performance to minimise demand for other materials, acoustic and fire insulation, and fire retardants. They can exploit concrete's thermal mass to minimise mechanical cooling and heating systems as well as ongoing operational energy demand.

Clients can choose to repurpose their concrete assets rather than demolish and rebuild.

End of Life

At end-of-life concrete can be recycled and reused as a recycled aggregate in new concrete or in unbound applications such as road construction and earthworks. Evidence from countries such as Japan, Netherlands and UK show that rates for concrete recycling can approach 100% when the right regulatory regime is in place to reduce landfilling, and enable collection and processing into quality controlled, cost competitive products. This provides both the evidence of what is possible and examples of how it can be achieved. Wider adoption of these regulatory measures will ensure the construction industry, and more specifically the demolition industry, can recycle more concrete at end of life.

Research is also underway into extracting more value from recycled concrete by using the finer particles, separated from the coarser aggregates, as feedstock in kilns and to manufacture new cement.

Innovative technologies are being developed that can increase the degree of recarbonation of concrete at end of life to help tackle climate change.

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor,
2 Kingdom Street, London,
W2 6JP, United Kingdom

T +44 2035 804268

Global Cement and Concrete Association

Our Recommendations

Achieving a circular economy in the built environment will require the collaboration of governments and policy makers at municipal, regional, national, and global level to implement enabling policies in the following areas:

1. Facilitate increased use of waste as alternative fuels and alternative raw materials in clinker (cement) production through:

   a Formal recognition of the simultaneous energy recovery and mineral recycling characteristics of 'co-processing' (Box Out 1) in waste policy frameworks, including at an international level the addition of a dedicated code (R15) for co-processing under Annex IVB of the Basel Convention, to recognise co-processing as higher in the waste hierarchy than incineration (Box Out 5).

   b Implementing policies to enable access to and use of suitable waste and secondary material streams, including biomass waste (e.g. through policy measures that reduce landfilling of waste that can be co-processed, encourage segregation of waste streams to enhance resource flows and enable environmental permitting at the cement works).

   c Providing a level playing field for the use of biomass across all sectors of the economy.

2. Promote the increased use of supplementary cementitious materials (SCMs) (Box Out 3) in cement and concrete manufacture to reduce clinker contents in construction codes and standards and in construction specifications on government funded projects.

3. Use policy instruments to reduce and phase out landfilling of concrete construction and demolition waste. This will close the circular economy loop with the recyclate replacing virgin material as general aggregate, aggregate for new concrete and raw material feedstock in clinker (cement) production.

4. Recognise in national Greenhouse Gas accounting and in life cycle analysis of the CO_2 uptake in concrete over its lifetime and at end of life (recarbonation) as a permanent CO_2 sink and facilitate access to concrete demolition waste to enable the industry to maximise CO_2 uptake (recarbonation).

5. Building policies that encourage designers to design for circular economy through whole project, whole life assessment; for example recognition of longevity and durability, re-purpose and second life for durable materials and design for disassembly where appropriate.

6. Policies including tax regimes and tax incentives that promote circular economy initiatives and encourage extended lifetime of built environment assets such as retention and re-use of structure in preference to demolition and new build.

Global Cement and Concrete Association

Our Commitments

GCCA and its members recognise the need for the industry to implement, support and advocate for greater circularity across the construction value chain.

GCCA and its members commit to:

1. Accelerate the implementation of circular principles in cement and concrete manufacturing processes and product design by further improving production efficiencies, reducing waste and using recycled and secondary materials as raw materials and fuels, as described in GCCA guidelines, GCCA's climate ambition and forthcoming GCCA 2050 Roadmap to carbon neutral concrete,
2. Report GCCA Member progress on circular economy metrics,
3. Innovate cement and concrete products and applications to enhance circularity,
4. Collaborate to promote good circular practice, standards and enabling policies, and
5. Encourage upfront circular design in the built environment, founded on a whole life, whole supply chain approach.

Box Out 1: Co-Processing

Co-processing is the combination of simultaneous material recycling and energy recovery from waste in a thermal process, which results in replacing natural mineral resources and fossil fuels such as coal and petroleum products.

Co-processing puts the cement industry at the heart of the circular economy and plays a key role in terms of waste management in local areas and municipalities. CO_2 is saved by replacing fossil fuels with the alternative waste streams, but also through those emissions not being made through incineration or through methane emissions from landfill.

Co-processing leads to four important outcomes:

- Reducing the CO_2 intensity of cement manufacturing.
- Reducing our dependence on virgin fossil fuels.
- Decreasing the amount of landfill waste.
- Minimising public investment costs in new dedicated facilities.

Co-processing is a more efficient waste management solution than landfilling or incineration and means the cement industry is a net consumer of waste and is at the heart of the circular economy. Used tyres, wood, unrecyclable paper, plastics, chemicals, and other types of waste are co-combusted in cement kilns in plants.

The potential of co-processing can be enhanced further through legislative and regulatory measures that recognises this form of material recycling and its contribution towards achieving ambitious recycling targets. In the European cement industry, more than 40% of thermal energy used to supply the clinker-making process already comes from waste and biomass. This can be replicated and increased throughout the world through industry initiatives with government and regulatory support.

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor,
2 Kingdom Street, London,
W2 6JP, United Kingdom

T +44 2035 804268

Global Cement and Concrete Association

Box Out 2: Alternative Raw Materials (ARMs)

ARMs are selected wastes and by-products that contain useful minerals such as calcium, silica, alumina, and iron and can be used as raw materials in the clinker making stage of the cement manufacturing process. ARMs replace primary raw materials such as clay, shale, and limestone in clinker (cement) manufacture. Their use is carefully controlled according to strict testing and other methodologies to ensure the correct chemical composition of the clinker is maintained and to avoid any impacts on the process or environment.

Box Out 3: Supplementary Cementitious Materials (SCMs)

It is commonplace in many countries to use SCMs, often by-products from other industries, such as fly ash from coal fired power stations and ground granulated blast furnace slag (GGBS) from iron ore production, to partially replace clinker in cement or directly in concrete. Typical replacement rates are 30% to 50%. For some applications, the properties of the concrete are usefully enhanced by these by-products, which are otherwise often landfilled.

Other common SCMs are limestone fines (for example, Portland Limestone Cement in North America) and naturally occurring pozzolans. A relatively new, but promising SCM is calcined clay.

SCMs may also be referred to as additions, extenders, alternatives, or replacements for Portland clinker cement, but the term secondary captures the fact that Portland clinker cement is the activator and that on their own they do not undergo the necessary chemical reaction to form concrete.

Box Out 4: Recycled Aggregates

Recycling rates for crushed concrete vary significantly, depending on local laws/regulations for landfilling demolition waste and accessing natural aggregates. Where there are incentives and/or penalties, the aggregates industry has adapted to increase the use of recycled concrete as a source of aggregates. Policies that require the segregation of good-quality concrete waste during demolition processes, as well as to maintain its traceability, also help to maximise the re-use of recycled concrete aggregate. High re-use rates are reported in Netherlands, UK, and Japan.

Recycled concrete is primarily used for road construction, with smaller amounts also used in new concrete production. When used in concrete production, concrete quality can be maintained at levels the same as that of concrete made with virgin aggregates by optimising the mix design (typically, recycled aggregate is restricted to 20% of the aggregates). Concrete production may also require slightly higher cement contents when recycled aggregates are used.

The use of recycled concrete aggregates is a clear and obvious example of the circular economy at play and has benefits that include reducing the use of natural resources and reducing landfilling.

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor,
2 Kingdom Street, London,
W2 6JP, United Kingdom

T +44 2035 804268

Box Out 5: Basel Convention

A key policy ask is the adoption of a dedicated "co-processing" code in international waste frameworks, for example the Basel Convention. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted on 22 March 1989. The overarching objective of the Basel Convention is to protect human health and the environment. Its scope of application covers a wide range of wastes.

The provisions of the Convention centre around the following principal aims:

- The reduction of hazardous waste generation and the promotion of environmentally sound management of hazardous wastes, wherever the place of disposal,
- The restriction of transboundary movements of hazardous wastes except where it is perceived to be in accordance with the principles of environmentally sound management, and
- A regulatory system applying to cases where transboundary movements are permissible,
- To support the cement industry's valuable contribution to the circular economy, whilst ensuring protection to human health and the environment, conventions such as the Basel convention need amendments to enable co-processing in cement industry kilns.

Global Cement and Concrete Association (GCCA) is registered in England & Wales, Company No 11191992

Registered office:
Paddington Central, 6th Floor,
2 Kingdom Street, London,
W2 6JP, United Kingdom

T +44 2035 804268