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Statement of the Architects' Council of Europe (ACE)

Designing for a Circular Economy

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Like many others, the construction and building sectors operate largely within a *linear economy model* of "take, make and waste", assuming that resources are abundant and that we can dispose of them without consequences. Yet, there is growing awareness of the finite nature of natural resources and fragility of our environment, and thereby of the urgent need to develop more sustainable and regenerative economic models, which allow resources to flow in a *circular* way within the economy for as long as possible and avoid the production of waste.

The construction and building sector have huge potential in terms of resource savings and waste reduction. In 2017, the construction and operation of buildings accounted for 36% of global final energy use and nearly 40% of energy-related carbon dioxide (CO2) emissions[1]. In the European Union, the construction and use of buildings account for about half of all our extracted materials and the sector generates about one third of all waste[2].

Action must be taken urgently to apply circular economy principles in these sectors – and architecture has a crucial role to play here.

The design phase: the right time to take action

Developing circular economy principles in the built environment is fundamentally about changing the way we design our buildings to ensure that they can be operated, maintained, repaired, re-used or adapted to new needs, while optimising resource value and generating as little waste as possible.

The architectural project makes things tangible and concrete and constitutes the right moment for bringing together all project stakeholders to discuss circular economy challenges and agree on the best strategies to create the greatest possible value out of minimum resources for the longest possible time. If high-quality architecture can create significant values and optimise the use of resources, conversely, ill-conceived buildings can cause considerable waste and costs, both in the short term and for future generations.

Architectural strategies towards circularity

Architectural solutions promoting circularity should consist of a value-oriented hierarchy of actions aiming to preserve and enhance the value of resources:

- **Cultural approach – maintain and re-use first: preserving resources by high quality design.** Preservation and improvement of the existing built environment is the best strategy for avoiding the generation of waste. Buildings that are socially and culturally appreciated have longer lifespans and inspire generations of owners and users to preserve the resources invested in them. What we build or retrofit today, should aspire to becoming cultural heritage for the future. Through smart renovation and adaptive re-use, old or disused buildings can find new, mixed or extended uses matching the social, cultural, environmental and economic needs of our time. Such an approach

[1] *2018 Global Status Report — Towards a zero-emission, efficient and resilient buildings and construction sector*: https://globalabc.org/resources/document/102#document

[2] Communication of the EU Commission on "Resource Efficiency Opportunities in the Building Sector, July 2014: http://ec.europa.eu/environment/eussd/pdf/SustainableBuildingsCommunication.pdf

makes it possible to save the embodied energy of construction materials, reduce the consumption of construction materials and limit urban sprawl.

- **Functional approach** – **designing for adaptability: accommodating changing needs.** Most changes in a building is the result of the occupant's desire to improve her/his living environment or to adapt it to new needs; and not because of technical problems or premature aging of materials. In most cases, buildings are demolished because their adaptation to new needs is seen as an unviable economic option, not because they are structurally dangerous. In order to ensure that buildings are used for the longest possible time, architects should design adaptable spaces and fabrics, making possible future changes as easy as possible, so the place can be adapted to new needs.
- **Technical approach** – **designing for easy replacement and direct reuse.** While the fabric of buildings may be able to last centuries, certain building components have far shorter lifespans, due to their own technical limitations, or because the occupant's needs change before their theoretical end of life is reached. To anticipate this shorter lifespans, it is important to enable an easy access to and removal of these components, so they can be cost effectively replaced or repaired, while minimising at the same time disruption to other components around them. Tactics include, notably, non-fixings, weak fixings, or mechanical fixings which can be undone (screws, bolts, etc).
- **Material approach** – **prescribing the right materials: making recycling possible.** Architects can prescribe components and materials that can be cost-effectively re-used or recycled; that are durable and robust; easy to handle; repairable; and bio-degradable – i.e. materials that can be kept within the economy for as long as possible.

Policy recommendations to support architects' endeavours

The European Union has proved to be a driver for a more circular economy in the building sector. *Level(s)*, a set of macro-objectives and indicators developed by the EU Commission to facilitate the assessment of the lifecycle environmental performance of buildings, can be a useful tool in this respect. However, further actions are needed to support the architectural approach:

- **All of the EU Commission's initiatives and policies impacting on the built environment** should be closely aligned and designed in a way to ensure that circular economy principles are favoured. In particular, this includes the Energy Performance of Buildings Directive (EPBD), the Smart Readiness Indicator (SRI), Level(s), the Building Passport, the Renovation Passport, the Ecodesign and Energy Labelling Directives and the Public Procurement Directives.
- **Support and enable excellence in design and planning:** preserve and enhance the quality of the built environment by implementing planning and architecture policies focused on design quality. These should include procedures for stakeholder involvement, to create as much value for as many stakeholders as possible and ensure that solutions allow the best possible future management of the resources invested in a lifecycle perspective.
- **Life cycle assessments (LCA) and life cycle costing (LCC) methods** should be encouraged by the EPBD to document the savings of embodied energy, resources and carbon emissions. As it becomes increasingly difficult to achieve further cost-efficient energy savings in the operational energy use of NZEBs, a stronger focus should be placed on saving embodied energy and carbon emissions.
- Reaping the benefits of the circular economy requires **better access to basic data** in order to be able to carry out life cycle assessments and life cycle costing. For small and medium sized manufacturers, making an environmental product declaration is expensive. This could be eased if the EU made basic data on materials available and supplied some basic tools for their analysis.

Level(s) could possibly give the market incentives to produce better and more credible data, if it included weighting factors related to data quality in LCA and LCC calculations. That would give suppliers an incentive to compete on quality and credibility of the data they supply.

- **Examples of excellence and case studies** should be collected and promoted as part of the rollout of Level(s).
- **Green and circular procurement** should be encouraged by the EU and Members States as they can provide a framework for more holistic consideration of environmental impacts and waste creation across the whole life-cycle of goods and services.

An ambitious implementation of circular economy principles in the building and construction sectors requires the involvement and collaboration of all stakeholders, from the construction materials and building components manufacturers to procurers, builders, users, building managers, recycling enterprises, etc.

Architects can play a key role in this chain, as many decisions taken during the design phase have long-lasting consequences on the environmental performance of a building, throughout its life-cycle.

Designing and building in a circular manner requires us to acknowledge that a building is above all a support for life. Beyond optimising the use of resources for their own stake, it is essential to seek to preserve and enhance the economic, social, environmental and cultural values that a place embodies for the end-users, so that it can be used for the longest possible time.