

Supporting the Development of Sustainable Buildings

As part of its Europe 2020 Strategy for a smart, inclusive, and sustainable economy, the European Commission launched (in 2011) its flagship initiative: “A resource-efficient Europe”. This initiative supports the shift toward sustainable growth via a resource-efficient and low-carbon economy.

One of the deliverables of this initiative in the area of sustainable consumption and production is that by 2020, “citizens and public authorities have the right incentives to choose the most resource-efficient products and services through appropriate price signals and clear environmental information.” [1]

With respect to the built environment, this requires assessing the sustainability impacts of buildings and the products used in their construction and properly using and communicating the results. These tasks require consideration of not only the environmental impacts of buildings and products but their social and economic impacts too. Political commitment at the highest level is needed to drive forward the development and use of sustainable buildings.

The European Association for External Thermal Insulation Composite Systems (EAE) is supportive of the EU’s efforts to the development of sustainable buildings. We know that this task will not be easy in a sector as diverse as construction, and our experience leads us to recommend that policy makers take into account the following considerations when addressing future initiatives for sustainable buildings.

14 important considerations

1. Sustainability assessment of buildings requires taking into account all phases of the life cycle.
2. Sustainable construction must optimize all three pillars of sustainability - environmental, economic, and social.
3. Performance assessment schemes already exist and should be harmonized from buildings to products.
4. The products and systems used for construction play a key role in building sustainability assessments.
5. Product assessments must be based on life-cycle thinking.
6. Harmonization is needed for LCA and ESD/EPD calculations.
7. Assessments should focus on resources and emissions.
8. Communication tools require further development.
9. The CPR (BWR 3 and 7) is the right way to declare social and environmental impact.
10. Back to buildings: A holistic approach requires good tools for design, calculation, and simulation.
11. Delivering sustainable buildings requires strong political commitment.
12. Voluntary building assessment is driving a sustainable building market.
13. The European Commission and Member States have an important role to play in improving sustainability performance of the entire built environment.
14. A European method to define regionally minimum performance targets should be developed.
15. A strong policy framework for sustainable buildings will boost the competitiveness of the European construction sector.

The building-level as basis

1. *Sustainability assessment of buildings requires taking into account all phases of the life cycle.*

The use-phase will remain the most determining factor in sustainability assessment of buildings. Increased overall sustainability performance of buildings is one of the most evident benefits when using External Thermal Insulation Composite Systems (ETICS) to improve the thermal performances of buildings' envelopes. For owners and investors improved sustainability performance increases the economic value and return of the building. For users and tenants it improves living conditions and comfort. For the society it reduces the buildings' energy consumption and greenhouse gas emissions. [2]

It is widely recognized that the greatest impact of buildings takes place during the use-phase. The priority is to achieve a high performing building stock - both with new built leading the way and refurbishment of the huge amount of Europe's low performing existing buildings. It starts with the complete and correct implementation of current EU legislation, notably the Energy Performance of Buildings Directive (EPBD) [3] and the Energy Efficiency Directive (EED) [4]. Full implementation of these legislations will increase the relative importance of environmental impacts of the other phases of the life cycle of the building. This is the reason why a full life cycle approach matters and will matter even more in the future.

The European construction sector is responsible for 40% of EU's final energy consumption, 50% of all extracted materials, 30% of water consumption, and 33% of generated waste; consequently, it stands as a key contributor to the sustainability objectives of the EU. [5]

Heating is the main source of energy consumption of buildings (67%). By thermal insulation this consumption can be significantly reduced. [2]

Meanwhile, improving the sustainability of the building stock should take into account the fact that the construction sector tends to function in long and slow cycles that include both new buildings and existing buildings (buildings to be renovated).

2. *Sustainable construction must optimize all three pillars of sustainability - environmental, economic, and social.*

Sustainability rests on three fundamental pillars: environmental, economic, and social. The environmental pillar is often represented as the most relevant for sustainable construction; however, the "essence" of any building is inextricably linked to the social role it plays in the life of its occupants. Consequently, the social pillar must be an intrinsic part of the sustainability assessment of the building. The better the social performance of a building the greater its chances to be used for a long time, which results in better resource efficiency.

The economic pillar must also be taken into account when assessing the sustainability of a building. And proper assessments should be based on life-cycle costing methods that balance the design and construction costs with their direct and indirect benefits, such as asset value, affordability, reduced operating costs, workplace productivity, and health and risk mitigation.

With this in mind, life cycle thinking - the idea of employing a holistic evaluation of the system impact which avoids burden shifting between different phases of the life cycle and/or between sustainability impacts - needs to be adopted when looking at the sustainability of any building.

In addition improving the energy efficiency of Europe's building stock may have significant impact on the economy of EU Member States, may create hundreds of thousands of new jobs and may support Europe's way back to economic growth. Finally reduced total energy consumption will reduce Europe's dependency on energy imports significantly. [5]

3. *Performance assessment schemes already exist and should be harmonized.*

Over the last 20 years, many countries have developed building assessment schemes, for example: BREEAM, HQE, DGNB, LEED, Verde, and SBtool. Such schemes cover the three pillars of sustainability as described above, and most of them adapt to local circumstances and legislation. Their scopes vary according to building purpose and construction type (new or renovated), and they each recognize that a broad range of factors influence the sustainability of any building, including the impact of its design and construction and its location.

In parallel, the European Committee for Standardization (CEN) is working (under a mandate of the European Commission) to secure a harmonized assessment method for a series of standards to assess the sustainability of the buildings, and CEN/TC 350, its technical committee for sustainability of construction works, has produced standards [6] covering the three pillars of sustainability. Some building assessment schemes are starting to converge towards each other and towards the CEN/TC 350 standards; however, a concerted effort for further harmonization is needed, because the wide array of current schemes creates unnecessary costs and decreases the credibility of sustainability assessments. In fact, we believe that the work done by CEN/TC 350 should be used to take the next step to harmonization of methods.

From buildings to products

4. *The products and systems used for construction play a key role in building sustainability assessments.*

Sustainability assessments of buildings and products used in their construction go hand-in-hand and cannot be reasonably decoupled. The full sustainability assessment of any construction product or kit, for example External Thermal Insulation Composite Systems (ETICS), cannot be performed without taking into account its intended use. Due to the very strong interdependence between the sustainability assessments of buildings and construction products, it is critical that assessment schemes on both levels be coherent. And the management structure of both types of assessment schemes should guarantee the coherence over time.

5. *Product assessments must be based on life cycle thinking.*

To properly assess the sustainability of any construction product, “life cycle thinking” is the best route. When considering the environmental impact, the life cycle assessment (LCA) method, which is defined by International Standards ISO 14040 and ISO 14044, helps to avoid the shifting of environmental-impact burdens between the various phases of the product life cycle. These general ISO rules have been specified for construction products by CEN/TC 350 (in EN 15804) and in ISO 21930. In parallel, the European Commission published (in April 2013) a new method for the assessment of Product Environmental Footprint (PEF).

The results of LCA calculations based on these methodologies can be translated into Environmental Product Declarations (EPDs) for single products or Environmental System Declarations (ESDs) for kits. Existing and upcoming legislation in some Member States (for example France, the Netherlands, and Belgium) already refers to these LCA and EPD/ESD assessment methods.

EAE members already produced ESDs for ETICS and EPDs for system components and published a large number of ESDs and EPDs in Europe for specific products according to ISO 14025. Currently we are going to update these declarations according to the new harmonized standard EN 15804.

6. *Harmonization is needed for LCA and ESD/EPD calculations.*

Under the current LCA and EPD/ESD systems, it is possible for identical products to have different EPDs/ESDs. In this regard, the work of CEN/TC 350 (EN 15804) is a great step forward, because it offers the possibility of harmonization of product performance assessment based on a method which takes into account the link to the building level. Consequently, it is currently the best basis for further development of a common assessment system.

To eliminate the cost and credibility problems caused by the existence and use of many parallel systems, common rules for LCA and EPD/ESD should be developed. For construction products the harmonized system should build further on existing work in EN 15804, and the impact categories should be adapted over time to remain state-of-the-art and to address the concerns of society. In addition, to improve the comparability of LCAs and ESDs/EPDs, the current problem of upstream/downstream LCA data in different databases should be addressed. Existing EPD/ESD schemes can and will co-exist in Europe. This is why ESD/EPD program operators are currently working on mutual recognition in the ECO Platform initiative, which is welcomed by EAE. However, there are still barriers to trade due to not fully harmonized databases and calculation schemes.

7. *Assessments should focus on resources and emissions.*

Overall product sustainability assessments should take into account all of the inputs (energy, water, biotic, and abiotic resources) and outputs (waste and emissions) involved in the

manufacture, use, and disposal of the product. And the impact assessment of these multiple resources should be performed on the basis of the entire life cycle, starting with the extraction of raw materials and ending with the end-of-life of the product including recycling.

Performing assessments that do not take into account some parts of the life cycle can lead to non-transparent information and erroneous conclusions. For example, the demolition/deconstruction of buildings plays an important role in the resource efficiency of the built environment. Consequently, all policies related to the end-of-life statuses of buildings and construction products should be coherent in order to incentivize stakeholders to improve end-of-life conditions and avoid land-filling whenever possible.

8. *Communication tools require further development.*

To encourage end users to make sustainable choices, it is necessary to communicate well with businesses and consumers regarding the environmental impacts of their choices. Communication requires transparency, not only with regard to the built environment but at the consumer level.

For B2B communication, the ESD/EPD serves as very efficient communication tool; however, a simplified tool is needed for B2C communications. Such a tool should be easy to understand but should be clear with regard to the impact of the consumer decisions, so that it does not mislead the consumer and result in poor decision-making. Benchmarking can be effective in helping to facilitate consumer choices.

9. *The CPR (BWR 3 and 7) is the right way to declare social and environmental impact.*

The Construction Products Regulation (CPR) Basic Work Requirements (BWR) 3 and 7 define the regulatory framework for the mandatory declaration of the social and environmental impacts of construction products. Declarations under BWR 3 and 7 relate to hygiene, health and environment over the entire life cycle, and sustainable use of natural resources. Indicators included in European harmonized technical specifications (hENs or EADs) in accordance with the procedures foreseen by the CPR should provide a set of indicators which could be used for calculations at the building level as notified by EU member states.

Then manufacturers may declare such LCA indicators in their Declaration of Performance or may make use of the NPD option if the respective indicator is not relevant where they want to place a product or kit on the market.

10. *Back to buildings: A holistic approach requires good tools for design, calculation, and simulation.*

To optimize the factors that affect building sustainability, it is necessary to use design, calculation, and simulation tools that employ a holistic approach to assess the sustainability of a building. Current building assessment schemes have begun to use such tools, but further harmonization and dissemination is required. We also see and welcome the emergence of

Building Information Modelling (BIM) that includes products' environmental information based on harmonized ESD/EPD.

When such tools are developed and in place, it will be necessary to train various stakeholders in their use. But when such automated systems are commonly used to calculate the impacts on building sustainability, assessments can be made more easily.

Delivering sustainable buildings needs strong political commitment

11. Voluntary building assessment is driving a sustainable building market.

Existing building assessment schemes focus primarily on the best performing buildings. As a result, they tend to pull the sustainable buildings market to a higher sustainability level by rewarding the top performers and induce a higher assessment cost, and they are able to cover specific demands.

Such schemes have a very specific role to play and have strong market recognition. In addition, their exclusiveness and the fact that they are voluntary provide them with real market value. As such, they cannot be replaced by a Europe-wide policy initiative. What these schemes can do is prompt the construction community to stay innovative, and this focus on innovation paves the way for future regulations.

EAE believes that these voluntary building assessment schemes have an important role to play, but we would support further harmonization of methodologies across Europe, based on CEN/TC 350.

12. The European Commission and Member States have an important role to play in improving sustainability performance of the built environment.

Although voluntary efforts are valuable for improving the sustainability of the built environment, the European Commission and Member States have a critical role to play in improving the sustainability of the entire building stock. To perform the role adequately, a harmonized set of indicators and related methodologies should be defined in product standards and building performance evaluation schemes to cover the main elements of the sustainability performance of buildings. Then national requirements can be defined at EU Member State level.

The indicators could be used to assess any building, which could lead to the creation of a Sustainability Performance Card for buildings, further developing the concept of Energy Performance Cards for buildings. This card would provide all relevant information about energy consumption and sustainability to consumers including contractors, home owners, or occupants.

Sustainability performance data could be collected to create a database that would support push up the sustainability performance of the entire building stock.

13. A European method to define regionally minimum performance targets should be developed.

In the long term, EAE recommends the development of a European method to define regionally minimum performance targets, which could be considered an Ecodesign requirement for buildings. The setting of such minimum requirements should follow the principles of subsidiarity, but all contributing to a global targeted performance at the European level.

To push the market, the Sustainability Performance Card described above and the definition of targets should develop as an evolutionary process, in order to allow time for industry to be prepared and ensure that targets help achieve ambitious goals. The evolutionary process of the EPBD and the EED, culminating with the NZEB by 2021, can be taken as an example for future policy initiatives on the sustainability performance of buildings.

The on-going evolution of reduced energy consumption during the use phase will lead to increased focus on the other stages of the life cycle of the building. Policy initiatives on sustainable buildings should be made coherent with the EPBD and EED in order to avoid negative interactions between them.

14. A strong policy framework for sustainable buildings will boost the competitiveness of the European construction sector.

A strong policy framework for sustainable buildings would greatly strengthen the competitiveness of the construction sector and would contribute significantly reducing its environmental impact. It could be exported outside Europe as, over time, other regions in the world face resource efficiency challenges similar to those faced currently by Europe.

Sustainability of the construction sector in a broader framework of sustainable cities and regions will serve as a driver for new jobs, innovation, and transformation to a sustainable future, in line with the EU 2020 strategy, the 2050 roadmap, and the European Commission's agenda for jobs, growth, fairness and democratic change [7].

References

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EAE position paper



About EAE

The EAE is the European association for External Thermal Insulation Composite Systems (ETICS), formed by 11 national ETICS associations, five major European supplying materials' associations and several supporting members, which include ETICS manufacturers and research institutes. The EAE represents about 85 per cent of Europe's revenue from ETICS. The main objectives of the association are to further promote the benefits of using ETICS and to support the safe and durable use of ETIC systems.

EAE represents the ETICS business in CEN and EOTA working groups. The EAE is a member of Construction Products Europe and the European Council for Construction Research, Development and Innovation (ECCREDI). Furthermore EAE is in contact with associations and initiatives beyond European borders, e. g. in China and Japan.

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