

## PU Europe thoughts on the forthcoming Commission Communication on Sustainable Buildings

### General:

- The built environment and in particular residential, commercial and industrial buildings greatly affect our daily life. People spend up to 90% of their life in buildings and the way these are designed, built and maintained has a substantial impact on people's health, well-being and performance.
- The construction sector represents about 10% of EU GDP and more than 50% of fixed capital formation. It is the largest single economic activity and it is the biggest industrial employer in Europe. The sector employs directly almost 20 million people, and indirectly and directly affects some 44 million workers. 40-45% of Europe's energy consumption stems from buildings with a further 5-10% being used in processing and transport of construction products and components.
- Significant progress has been achieved over the past decades in improving building design solutions, environmental and thermal performance levels, indoor climate and accessibility.
- The construction industry recognises that further progress is required. It is increasingly making environmental product footprints available in the form of Environmental Performance Declarations (EPD) to allow performance assessments at the building level.

### What should the Communication cover?

#### What are Sustainable buildings?

The Brundtland Commission of the United Nations Commission on Sustainable Development defined sustainable development as "...a continuing process of economic and social development, in both developing and industrialised nations that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Sustainable construction could be described as the process of developing built environments that balance **economic** viability with **conserving resources**, reducing environmental impacts and taking into account **social aspects** such as accessibility and indoor air quality.

- **If the Communication wants to address sustainable buildings, it has to cover the economic, social and environmental pillars of this concept. Otherwise, the scope should be clearly limited to the environmental performance.**
- **The Communication should make clear that sustainable building requires a holistic approach combining design, construction / maintenance, use-phase, end-of-life and product performance** (The interrelation will be explained below on the example of air-tight envelopes).

#### Example: air-tight building envelopes:

Nearly zero energy buildings (the major requirement for sustainable buildings) can only be achieved if any uncontrolled ventilation is avoided. In other words, the building envelope must be air-tight. This requires the availability of building products which can achieve this. The architect must select the product and design the building in a way that air-tightness is guaranteed. The contractor has to assemble the products correctly and according to the plans. Even when this is achieved, air-tightness might be compromised when technical installations (cable, pipes) are put in place. In other words, all members of the supply chain must be aware of the challenges and risks and trained to cope with them.

#### The starting point – holistic building design

Any construction project starts with the design phase. The design will depend on the type of building (hospital, office, residential etc.), its location, climatic conditions, regional building traditions etc. It will determine functional characteristics, energy performance levels, material choices, indoor air quality and, last but not least, related costs. It is of the utmost importance that designers have access to reliable and affordable information on the technical, thermal and environmental performance of construction products and are able to calculate the building performance through appropriate software

tools. Designers must find the best possible trade-off between the functionality of the building, embodied impacts of materials, the energy performance of the building (which is by far the most important indicator) and, least but not least, its cost.

- **The Communication should emphasise the importance of the design phase, at which all major economic, environmental and social performance parameters for the whole building life cycle are determined.**
- **The Communication should call for action to facilitate the access of designers / developers to software tools and data bases enabling them to calculate the thermal and environmental performance of buildings. More specifically, the EU could develop**
  - **its Life Cycle Inventory Database (ELCD) to become the reference source for all LCI data for construction products;**
  - **or support the development of harmonised software tools using LCI data for construction products to assess the environmental performance of building design options.**
- **The Communication should call on Member States to invest in the qualification of designers to enable them to use appropriate data bases and software tools.**
- **The Communication should call on the legislator to ensure that public works contracts for buildings must not be awarded to the lowest initial price. Award must be based on life cycle economic and environmental performance** (As the public procurement directive is currently under revision (first reading EP), this Communication will probably be too late).

### **Selection of construction products**

The Construction Products Directive / Regulation and national regulations clearly fix a procedure to follow when specifying construction products for a building project. All Essential / Basic Works Requirements of the European legislation refer to “works” (building). They are translated into product requirements through harmonised European standards.

#### Steps:

- ***Fitness for use:*** can a product be used in a specific end-use application?
- ***Durability:*** What is the expected service life of that product? Are there maintenance requirements?

Once this is known, the environmental performance of the building can be established based on specific product choices.

- **The Communication should recognise the selection process for construction products.**

### **Tools to assess the environmental performance of buildings**

The aim of assessing the environmental performance of buildings is to minimise resource use of the whole building life cycle and for a given functionality and defined performance parameters. Tools to achieve this can include appropriate design solutions, choice of high performance construction products, recycling of products at the end of their life, quality management for the construction process etc. Trying to promote one of these approaches (i.e. recyclability), without knowing its related environmental impact, will not necessarily lead to better buildings.

With a view to ensuring a holistic view, the construction industry, in cooperation with national regulators and research institutes, has been developing a set of standards to assess the economic, social and environmental performance of buildings. The environmental assessment standards are mandated by the European Commission and have been published recently. The assessment is based on EPDs covering 22 indicators, thus providing the most comprehensive set of environmental impact information. The standards explicitly state that comparisons between EPDs are not possible and product performance can only be assessed at the building level. This also means that intermediary construction products cannot claim to be “green”, “ecological” or “environmentally friendly”.

The construction products industry is pro-actively applying these standards and has invested millions of euros in EPDs (Examples: France: <http://www.inies.fr/IniesConsultation.aspx>, Germany: <http://bau-umwelt.de/hp354/Deklarationen.htm>). Governments / organisations supported by public authorities increasingly refer to the TC350 for the establishment of national EPD data bases (B, D, F, IT, NL, UK). However, more high quality EPDs need to be developed, national databases harmonised and the building assessment based on EPDs / LCI data promoted. Certain Member States (NL) envisage to set sustainability thresholds for buildings at a later stage (for example: GWP/m<sup>2</sup> over 50 years), but believe it premature today as more experience needs to be gathered.

- **The Communication should recognise the TC350 standards as the most developed scheme for the sustainability assessment of buildings.**
- **The Communication should explain that**
  - comparisons of construction products based on a kg or m<sup>2</sup> basis are not valid;
  - their environmental performance can only be assessed at the building level;
  - environmental labelling of construction products is pointless, as one and the same product may be the best performer in one application, but show poor performance in another one.
- **The Communication should encourage Member States to require sustainability assessments for new building projects based on the TC350 standards.**
- **The Communication should call for a European research project to explore ways to set thresholds for the environmental performance of buildings** (building typology, green-field / brown-field, building traditions, trade-offs between environmental footprint and building performance, indicators to become subject to thresholds, risk of “shifting” burdens from one impact indicator to the next).
- **The Communication should explain the link between recyclability / recycled content and the TC350 standards** (If a product can be recycled, it has no end-of-life burdens and obtains a better overall performance. If a product uses recycled content, the environmental burden from raw materials is reduced and it obtains a better overall performance.).

### **Tools to assess emission of dangerous substances from construction products**

According to DG SANCO figures, the share of Indoor Air Quality associated Burdon of Disease attributed to construction products is negligible (0.04%). Still, producers of building materials have to ensure that their products cannot cause any hazard to the users of buildings.

Referring to the ER / BWR3 of the CPD/CPR, the European Commission is currently revising product mandates to include relevant dangerous substances based on notifications from national governments. Furthermore, the Commission mandated CEN to develop harmonised emission test standards. Until these are available, national governments / private schemes refer to the ISO16000 standards (D, F, FIN).

- **The Communication should confirm that health aspects of construction products used for sustainable buildings are exhaustively covered by REACH requirements and the CPD / CPR provisions applied via ISO16000 / TC351 test standards and related producer declarations.**
- **Other health-related issues must be addressed in the design phase through proper ventilation and selection of building products.**

### **Construction process**

#### **• *Skills of contractors***

Sustainable buildings are first and foremost very low energy buildings and the accurate execution of design plans is highly important. It must be avoided that contractors use products which were not specified by the designer or assembly products in a faulty way. Contractors must develop a holistic view on the building performance with all its aspects (see example on air-tight envelopes).

The role of contractors is even more important in refurbishment projects, which do not involve a designer.

- **The Communication should stress the need to invest in the training of contractors.**
- **The role of the EU is somewhat limited. However, initiatives such as the IEEP-financed training platforms for energy efficient buildings should be supported.**

#### **• *The role of supply teams***

Supply teams (integrated supply chains) bring together developers, designers, major product suppliers and contractors. They cooperate over a longer period of time and on several projects. This facilitates a continuous learning process and hence, reduces the risk of faulty construction (see example on building air-tightness).

- **The Communication should explore the added value of supply teams in achieving sustainable buildings.**