Current trends of development and technical assessment of innovative environmentally-friendly building products in Europe

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Approaches to Environmental Considerations for Building Products

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A few mega trends

- **Increased urbanization**
  - In 1800 2 % of the worlds population lived in the cities
  - In 1950 this number was 29 %
  - UN stipulates that the number will be 55 % in 2011
  - EXPO 2010 in China focused on *Better city, Better life*
- **Demand for oil**
  - BRIC (Brazil, Russia, India, China) has transposed from developing countries to countries with a large middleclass with demands for consumer goods equally to the developed countries
  - The European Commission has identified 41 important minerals and raw materials. There is already a critical shortage of 14 of the raw materials on this list
- **Climate changes at increased speed**
  - Snow in Portugal
  - Tropical storms in Denmark

The European framework

ETA DANMARK

- Economical climate
  - Severe impact on most European countries – especially in the southern part of the region
  - High un-employment, deficit on state finances and very small growth
  - Construction sector highly influenced
- Regulatory situation
  - Regulation on buildings and levels of required performance is a national issue in the member states
  - Regulation for the marketing of construction products is made by the European Parliament

Regulations in Member States

- The local climate influences the national emphasis
  - Higher requirements for thermal insulation in North
  - Higher requirments for cooling in south
  - Generally higher requirments for better utilization of energy ressources by reduced energy consumption and inreased use of renewable energy sources
- The national ambitions and ability determines the pace and timeline
  - Regulations will initially focus on increased requirements related to energy consumption of the building in use, e.g. in Denmark increased requirements to thermal insulation of buildings and requirements for air tightness testing and thermografic photography of buildings
  - But with objective based regulations, the environmental impact of building materials will be an issue

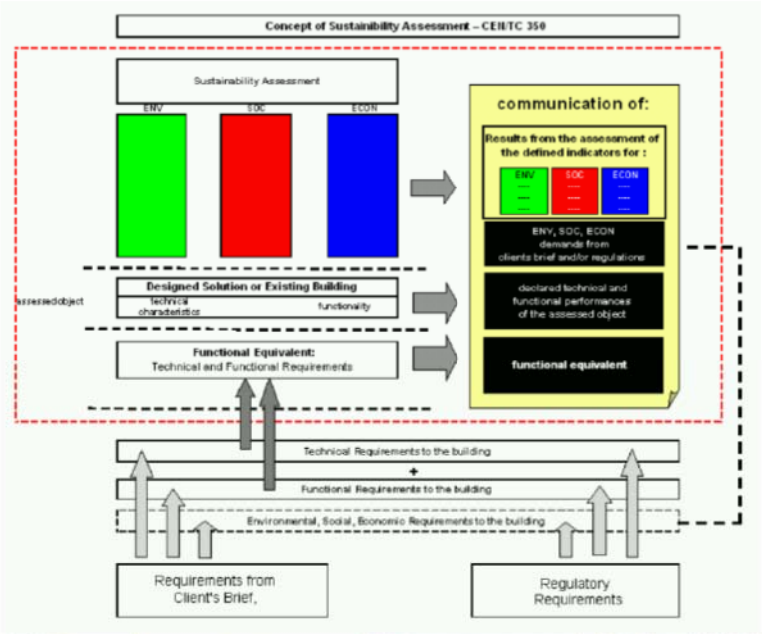
Regulation for marketing construction products

- Replaces Construction Products Directive
- In this context the major new addition is:
- Sustainable use of natural resources
  - The construction works must be designed, built and demolished in such a way that the use of natural resources is sustainable and in particular ensure the following:
    - (a) re-use or recyclability of the construction works, their materials and parts after demolition;
    - (b) durability of the construction works;
    - (c) use of environmentally compatible raw and secondary materials in the construction works.
- Comes into force 31 July 2013
- Requires that the member states have legal requirements

Product related initiatives

- European Commission recognizes the need for a common basis for declaration of environmentally related data.
- Has asked the European standardization organization – CEN - to *develop horizontal standardized methods for the assessment of the integrated environmental performance of buildings*. These will be based in ISO 14025 and 14040.
- This will – among others – lead to a number of standards for construction products and materials from which the integrated environmental performance of the products can be determined. Basis will be ISO 21903
- Environmental Product Declarations will be an integrated part of the performance statements for the construction products

Complex relation between legal, technical and functional requirements and the expectations



Standards published and available in near future

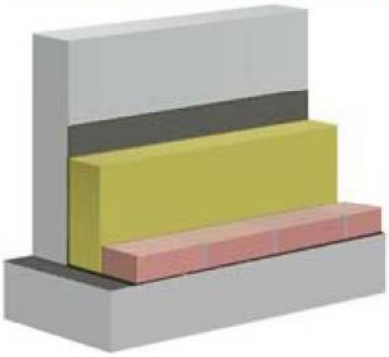
Standards	Stage
EN 15643-1:2010 Sustainability of construction works - Sustainability assessment of buildings - Part 1: General framework	Published
EN 15643-2: 2011 Sustainability of construction works - Assessment of buildings - Part 2: Framework for the assessment of environmental performance	Published
EN 15643-3, Sustainability of construction works - Assessment of buildings - Part 3: Framework for the assessment of social performance	Available 01-2012
EN 15643-4, Sustainability of construction works - Assessment of buildings - Part 4: Framework for the assessment of economic performance	Available 01-2012
EN 15978:2011 Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method	Available 09-2011
TR 15941 Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data	Published

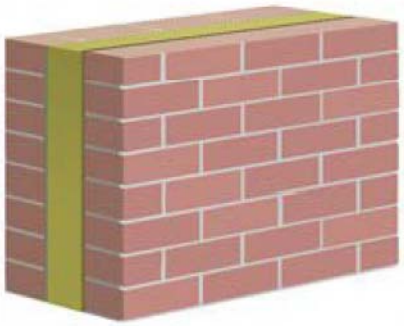
Purpose of the initiative

- The standards shall be usable to both standardized and innovative construction products
- CEN/TC 350 Working Group 3 is working on standards on the product level
- In the absence of the European standards, national schemes prevail where available
- Often ISO 14025 and ISO 21903 is the basis
- They will support the building certification schemes such as BREEAM and LEED
- In the meantime focus will be maintained on the environmentally related aspects such as energy efficiency

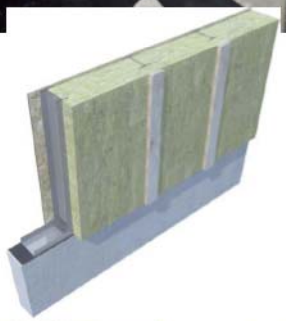
Innovation

- The increased emphasis regulation for energy efficiency is a driver for innovation
- A conventional Danish external wall would need to be 0,5 m thick to fulfill the present thermal insulation requirements

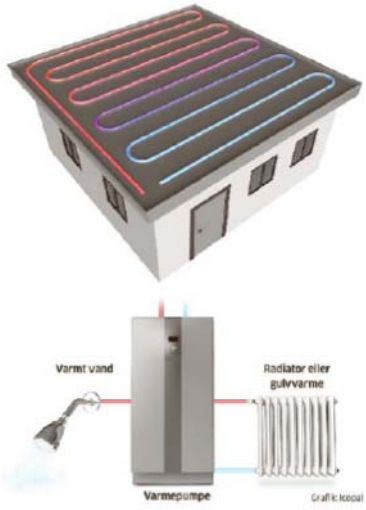


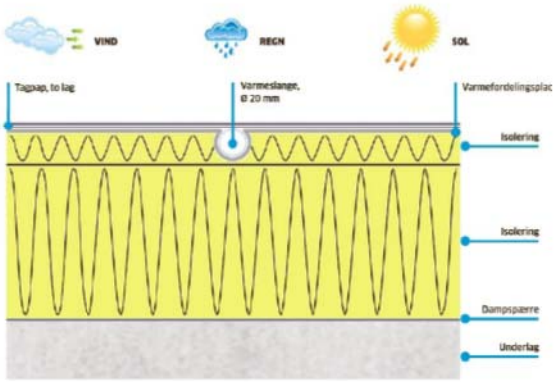


Innovative environmentally-friendly building products – mineral wool building system



Innovative environmentally-friendly building products – terrestrial heating on the roof





Closing remarks

- The major topic in Denmark concerns renovation of the existing building mass.
- If houses, which were built according to the 1977 regulation, were renovated to the 2011 regulation on thermal insulation, it would result in a 22 % decrease of energy consumption form the buildings. This is equivalent to 1,8 mil. tons CO_2 just this year and EUR 1,3 bill.
- There is an large European wide existing building mass, which needs renovation and the environmental impact of this enormous.

Thank you for your attention