Current difficulties with creation of standardized digital climate calculations for infrastructural projects

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MARKNADSANDELAR NORDEN
Den nordiska byggmarknaden är mycket fragmenterad. NCC är ett av de största byggbolagen i Norden med en marknadsandel på 5 procent. Byggmarknaden i Norden omsatte 2015 circa 1 226 Mdr SEK. (Källa Euroconstruct)
Target scenario for CO2-neutrality by 2050 (EU- and Swedish national goal)
The ongoing process for establishment of accounting and reporting with CO2-eq

Swedish Government

EU and Sweden: Climate neutrality goal by 2050

International standards on EPD/LCA

EPD Program Operators

Privat and public clients

Transportation Administration, STA

Contractors

Material producers

Access to project-specific LCA-data on design and optimization processes, maintenance, end-of-life etc for engineering works

Access to product-specific LCA-data on production processes for building materials

The joint project: Developing of the delivery interface

Under development

Requirement
Swedish joint project

- **Participens:**
  - Major Swedish and Norwegian contractors, material producers, branch associations and clients.

- **Scope:** to develop the overall framework for the delivery interface with automated climate calculations in the EPD-format for infrastructural projects.

- **Goals:**
  - **Benchmarking of existing LCA-calculation models** for bridges and roads in Sweden and Norway
  - **Conformity analyze of these models** with EPD-calculation model according to EN 15804 and PCRs for bridges and roads
  - **Development of the framework** for the delivery interface with automated climate calculations in the EPD-format.
  - **Development of the technical specification list** with functions needed in the delivery interface.
  - **Pre-configuration of** the first version of the delivery interface
  - **Overall test** of the pre-configured delivery interface to produce automated climate calculations in the EPD-format on some projects
  - **Recommendations** for the next step.
Several options for an EPD or a climate declaration verification

1. Verify each single EPD
   - Branch associations have developed EPDs for their products
   - NCC as a first contractor in Sweden has developed 5 EPDs and 2 climate declarations for both products and engineering works as bridges.

2. EPD Process Certification for multiple EPDs
   - The internal procedures and processes of a company to generate verified EPDs are checked yearly by an accredited certification body
   - Swedish based Vattenfall has established the EPD Process Certification

3. Pre-configuration of LCA software as an EPD-tool for automated multiple EPDs
   1. That allows automation of the process for data collection and creation of multiple EPDs according to a certain PCR
   2. Pre-verified LCA-software can be connected to the company’s existing design and cost calculation IT system.
   3. This has been tested in the joint project.
Deliveries of the joint project

- Detailed specification of requirements for a pre-verification
- Developed templates for data collection and EPD-report
- Performed Inventory Data Collection for 3 road projects
- Performed Inventory Data Collection for 2 bridge projects

PCR Highways

PCR Bridges

A commercial LCA-tool, which fulfills pre-verification rules

* Test of creation digital climate calculations for some infrastructure projects

Product development, marketing, optimization of supply chain, internal strategies etc.

* Creation of an EPD-report for tested projects
  - X tons CO₂-eq/m²
  - Y kg CFC₁₁ eq
  - Y kg (PO₄)³⁻ eq

Reporting to the clients
Current difficulties with creation of standardized digital climate calculations

- Lack of common business-to-business model with EPDs - No general acceptance of EPD as an industry-wide standard
- Contractors’ planning and design systems don’t have all needed data for impact assessment of the entire life cycle
- High cost of EPDs. Manuel data collection.
- Who is responsible for reliability of the results from climate calculation for new innovative products in early project stage? - Project management control and validation routines should be developed
- It would be easy to have one PCR for various types of infrastructural works
- More test projects needed.
Next step

- Integration of step-wise EPDs to current design and optimization processes in BIM and CAD
- A new PCR for Bridges, Elevated Highways and Tunnels on the way, will be available September 2017 and will replace PCR 2013:23 for Bridges and Elevated Highways
- NCC’s new project:
  - A standardized climate calculation with BIM
  - Design making with LCA for purchasing processes
Thank you!