CLIMATE CHANGE

Sustainability in the Construction Sector

Prevention and adaptation

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What has climate change got to do with the construction sector??????

- The construction industry is both an important contributor to the causes of climate change and is a sector that bears significant consequences of climate change.

- Sustainability issues in the construction sector (Frankfurt 2010).

- Consensus on significant greenhouse gas emissions due to the production and transportation of cement, steel and other building materials.
Very complex problem

- There is more or less consensus on the fact of climate change, but not on the best “solutions” to prevent it or to adapt to it
- Is it technically feasible to make a distinction between “naturally” occurring weather conditions and the consequences of climate change?
- Paris agreement 2015 and Urgenda case
- Focus EU on adaptation measures and resilience (developing standards)
The negative impacts of extracting construction minerals often overlooked

- The consumption of natural resources by the construction sector is enormous. The impacts of extracting construction minerals such as sand and gravel on the local environment
- Plundered landscapes and eroded coastlines vulnerable to extreme weather
- Chain of supply interrupted by flooding etc. dependency issues
- Bridges collapsing by (il)legal sand mining
Preventing and mitigating greenhouse gas emissions as a business principle

- It will not take long before the general public will disapprove of the negative impacts of extracting construction minerals.
- Parties in a construction project (including investors) will be held accountable on where and how building materials are sourced.
- Climate related supply chain interruptions.
- Long term investments need long term vision and need to include indirect causes and consequences.
Solution more reuse and recycling of building materials?

Perhaps one of the solutions

- Art and science of reuse and recycling
- Fresh visions on building materials, new applications of materials traditionally outside the building sector. Examples: shredded old tyres in road paving, waste glass in concrete
- EN standards for concrete now have specifications for recycled aggregates and additions
Barriers: absence of stimulating regulatory framework

- In many jurisdictions no one is held legally responsible for absence of reuse/recycling
- Emotional: new materials are better and waste is dangerous stimulated by waste regulations
- Lack of incentives: it is cheaper to dispose in a landfill than to reuse/recycle
- No strict permitting for extracting sand and gravel and –often- extraction is in other country than country of use
Barriers: regulatory framework

- Strict waste regulations may make reuse/recycling of building materials extremely difficult

- Although “new” building materials also need to comply with all EU regulations on hazardous substances, reused/recycled building materials may have the added burden of waste regulations

- It would help if stigma’s against “used” products were weeded out of the regulatory framework
Regulatory framework EU

- Environmental law is very important for construction projects and within the EU is mostly derived from EU legislation.
- Within the EU there is a common body of EU legislation that does not require implementation in national laws.
- Obligations for member states to reach very high percentages of reuse/recycling, especially construction/demolition waste. How they achieve this is mostly up to them.
Procurement and contracting: Who benefits short term and long term

- Short term vision: ignoring climate change causes and consequences
  - procurement only on price
  - design with conventional technologies/materials
  - taking no responsibility for origin materials
  - adverse weather conditions not addressed in design and contract specifications
Long term benefits

- Contract form and bidding documents reflect risks climate change
- Procurement on best value including social responsibility factors
- Whole life approach to cost (including end of life costs)
- Adverse weather risks during and after construction addressed
Develop and specify procurement procedures and contract clauses

- Special Provisions in the bid documents and in the contract depending on form of contract/party
  - Waste recovery, recycling practices and use of used/recycled materials
  - Require a minimum percentage of sustainably resourced and used/recycled building materials
  - Specify the product efficiency and longevity (i.e. life cost: options for reuse, repair, upgrade or modification, deconstruction structure)
Risks to address in contract specifications

- Do existing building performance standards need adaptation to enhance the resilience to extreme weather? And if so, how and for which circumstances?

- Do construction contracts need to redefine climate change risks? How is this done? Insurance for disasters?

- Does fitness for purpose mean that a structure must withstand all types of weather conditions?
Design for reuse, recycling and resilience

Define benchmarks. For example:

► Designing to optimize deconstruction of structure at end of use (---% materials to be reusable)

► ---% recycled materials to be used (technical standards for recycled materials)

► Renovation and maintenance projects will reuse materials unless...

► Insurer: certain resilience standards met
EU adaptation strategies for climate change

- Revision and development of EN standards aiming to improve the resilience of European infrastructure in the priority sectors to the adverse effects of climate change
- CEN-CENELEC Guide 32 'Guide for addressing climate change adaptation in standards'
- EU funding of projects
Climate change

- Responsibility between the players – industry, government, owners/developers, financial institutions, insurers etc. will need to be clearly defined. They are all a link in the chain.

- Regulatory framework absent, incomplete and/or incompatible

- Standardisation for resilience of structures and reuse/recycling building materials would help