

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