

Emission-free Construction Sites

Publication - Knowledge Gaps and Research Needs



Nordic Sustainable Construction

15.02.2024



Today's agenda

- Introduction of the project -
Ástrós Steingrímisdóttir
- Presentation of the report
Aðalsteinn Ólafsson
- Questions - Slido

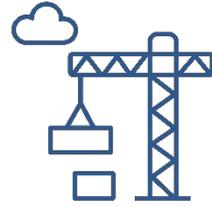


Nordic Sustainable Construction

- A programme under the Nordic Council of Ministers
- Five work packages
- Ministry of infrastructure - WP4

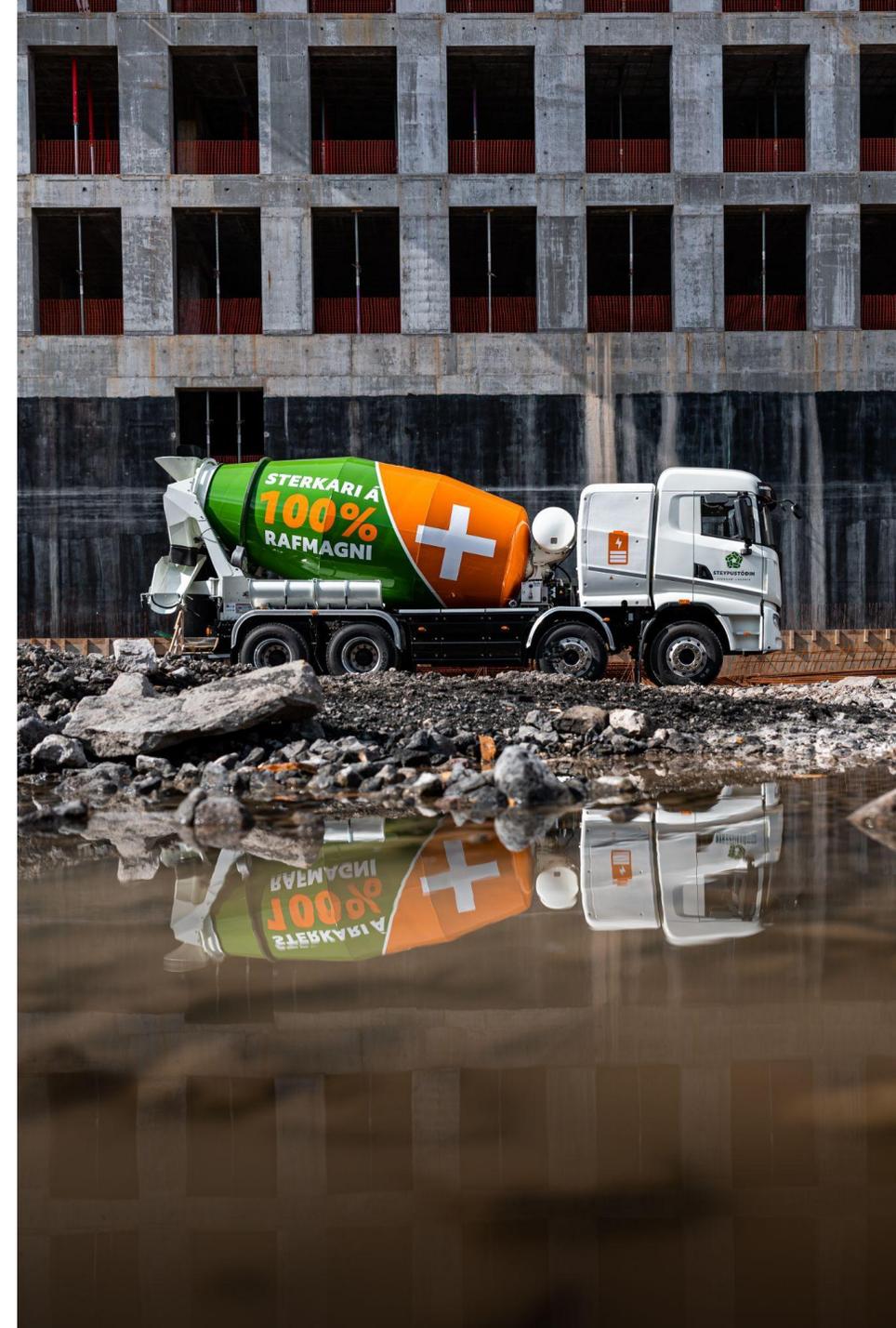


WP4 - Emission-free Construction Sites



- Report on definitions, boundaries and terminology
- Video from Nordic construction sites
- Report on knowledge gaps and research needs

<https://nordicsustainableconstruction.com/>



Coming up

- Guidelines - plan, procure and evaluate June 2024
- Report on standards, rules and regulations that can be hindering late 2024



Emission-free Construction Sites

Publication - Knowledge Gaps and Research Needs



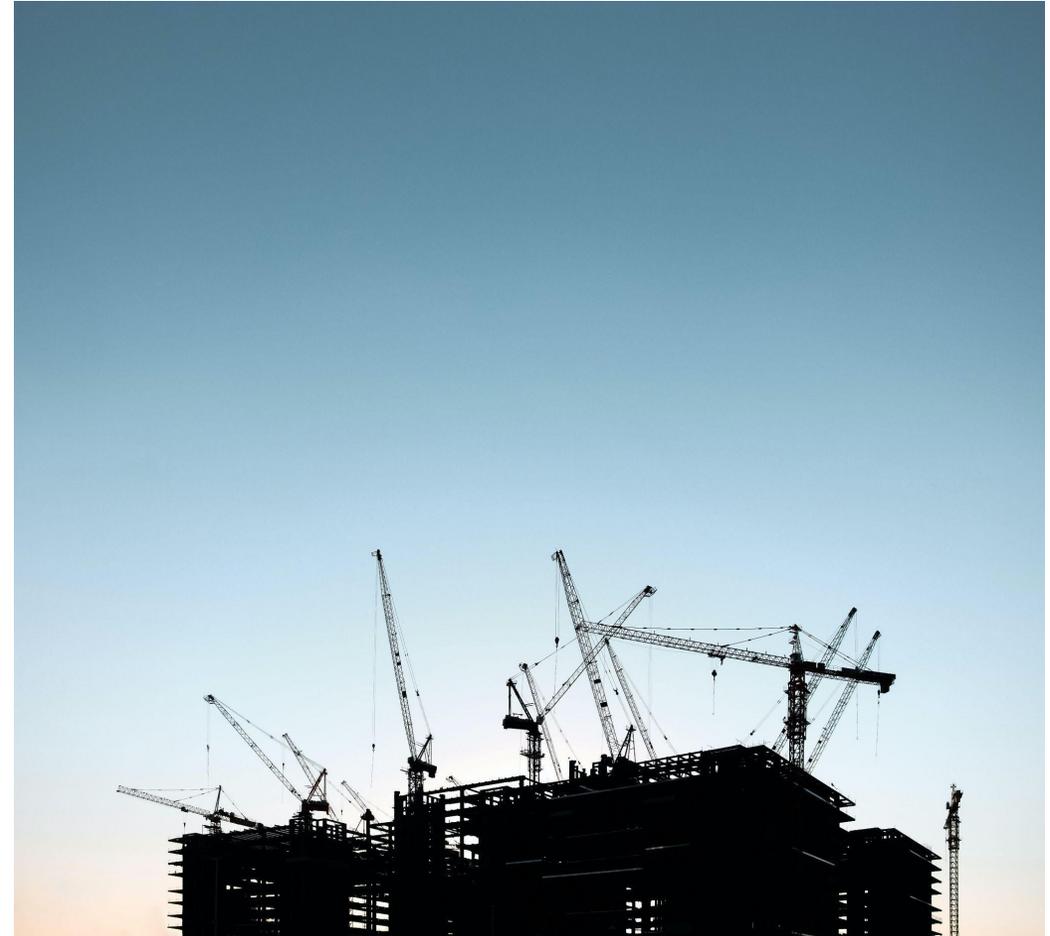
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Report on knowledge gaps and research needs

- Planning and designing
- Assessment of environmental impact
- Energy in construction and transport
- Waste and material resources
- Regulations and Incentives
- Sustainability



Knowledge and Research

New field

Minimise risk

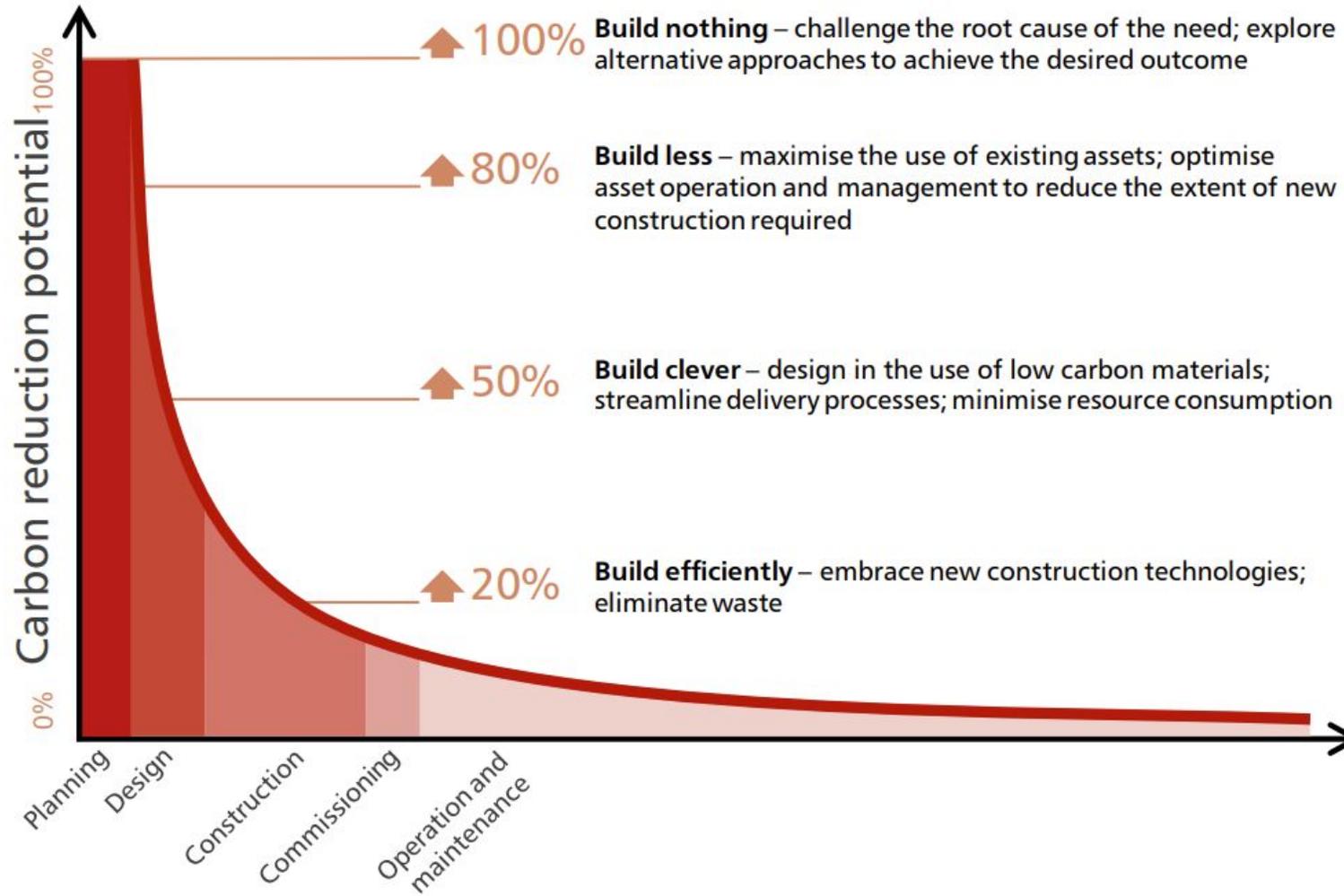
Overcome barriers

Develop best practices

Build industry knowledge



Chart 1.C: Carbon reduction curve



Source: Green Construction Board



Planning

Impacts from planning decisions

Transport of bulk materials

Options for clean energy

Storing and reuse of material



Design

How does design impact construction site emissions?

Earthwork

Transportation

Heating and drying

Waste production



Planning and design - Recommendations

- How do the pre-construction phases influence emission during construction ?
- How does the planning phase influence material transport ?
- How do building types and materials affect on-site emissions?

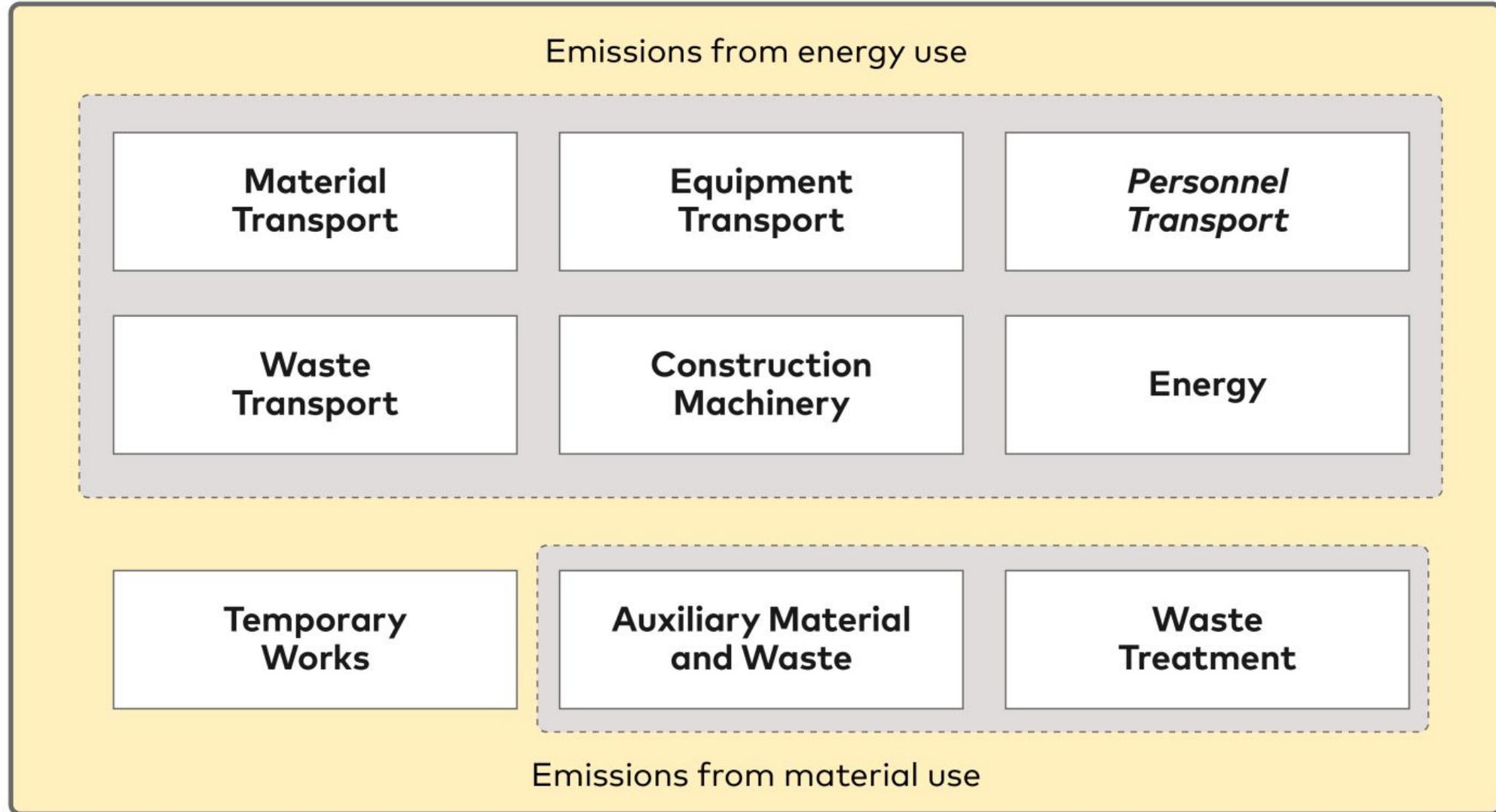


Assessment of environmental impact

"You can't improve what you can't measure"
- W. Edwards Deming



CONSTRUCTION SITE BOUNDARIES



Assessment of environmental impact

LCA for the construction process is complicated

There is limited amount of data

Great variance between projects

We do not really know typical emissions for the construction phases (A₄ - A₅)



Assessment of environmental impact

- Develop and harmonise a Nordic framework for measurement and assessment.
- Improve knowledge on emissions related to modules A₄ and A₅.



“The cleanest energy is the energy that is not used”

Energy efficiency
Energy use pr. built area

Adapt technology from cars
Battery - Hydrogen - Biofuels

Energy infrastructure
Country specific solutions



Batteries ?

Hydrogen ?

Electricity not available
Peak loads

En utslippsfri anleggsprosess
i Rogaland



Energy in construction and transport

- Build using less energy and improve energy efficiency
- Investigate clean energy options
- Invent new methods to manage energy and energy infrastructure



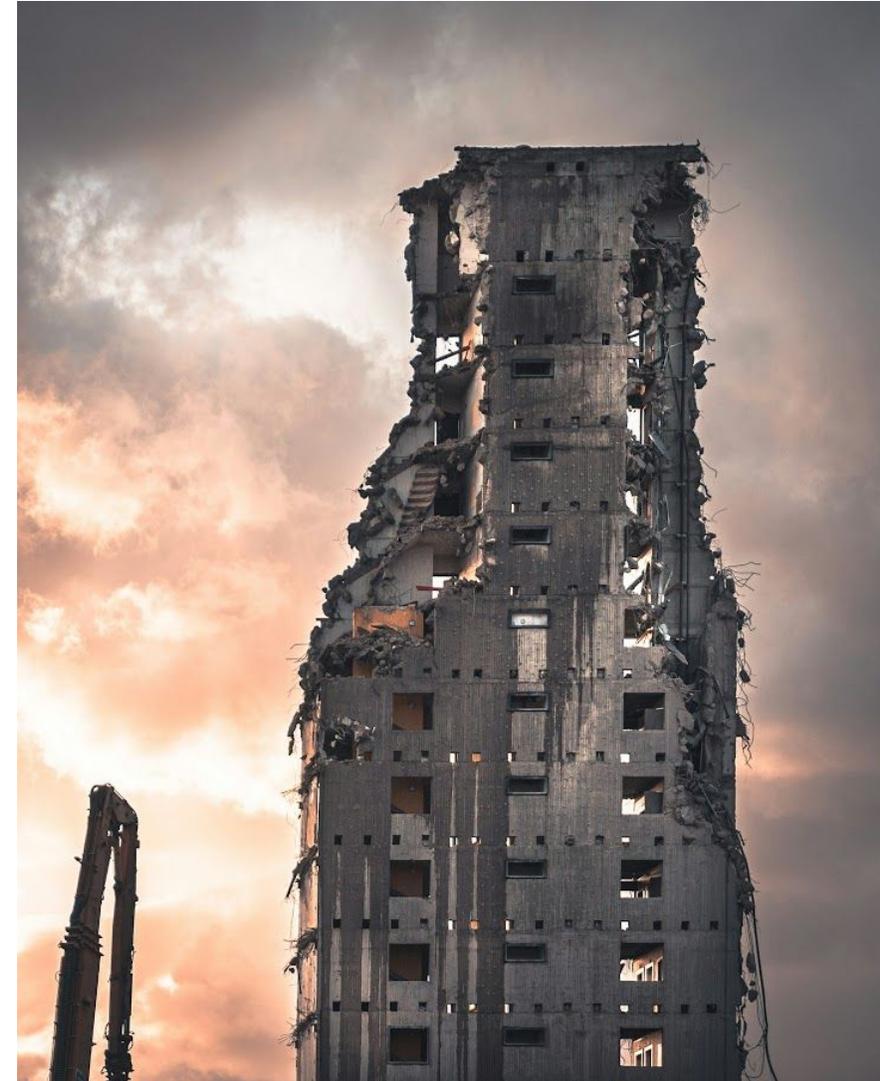
**“The least harmful waste
is the waste that is not produced”**

Waste = Material resources

Emissions from production of wasted
building materials

=

Construction site emissions



Circular solutions

Waste will be produced
How can we use it as resource?



Waste and material resources

- Clarify the quantity of waste, its management, and emissions
- Gain insight into how building design impacts construction waste
- Enhance the reuse and recycling of material



Carrots & Sticks



Carrot
[noun] (literal)
A plant of the parsley family, valued for its edible root.

[noun] (figurative)
An incentive or reward to encourage a specified outcome.



Stick
[noun] (literal)
A tree branch that has been cut or broken off.

[noun] (figurative)
A punishment or penalty, used to induce cooperation.

Regulations and Incentives

Green public procurement

Limits on emissions from construction activities

Green Financing

How to evaluate the results?



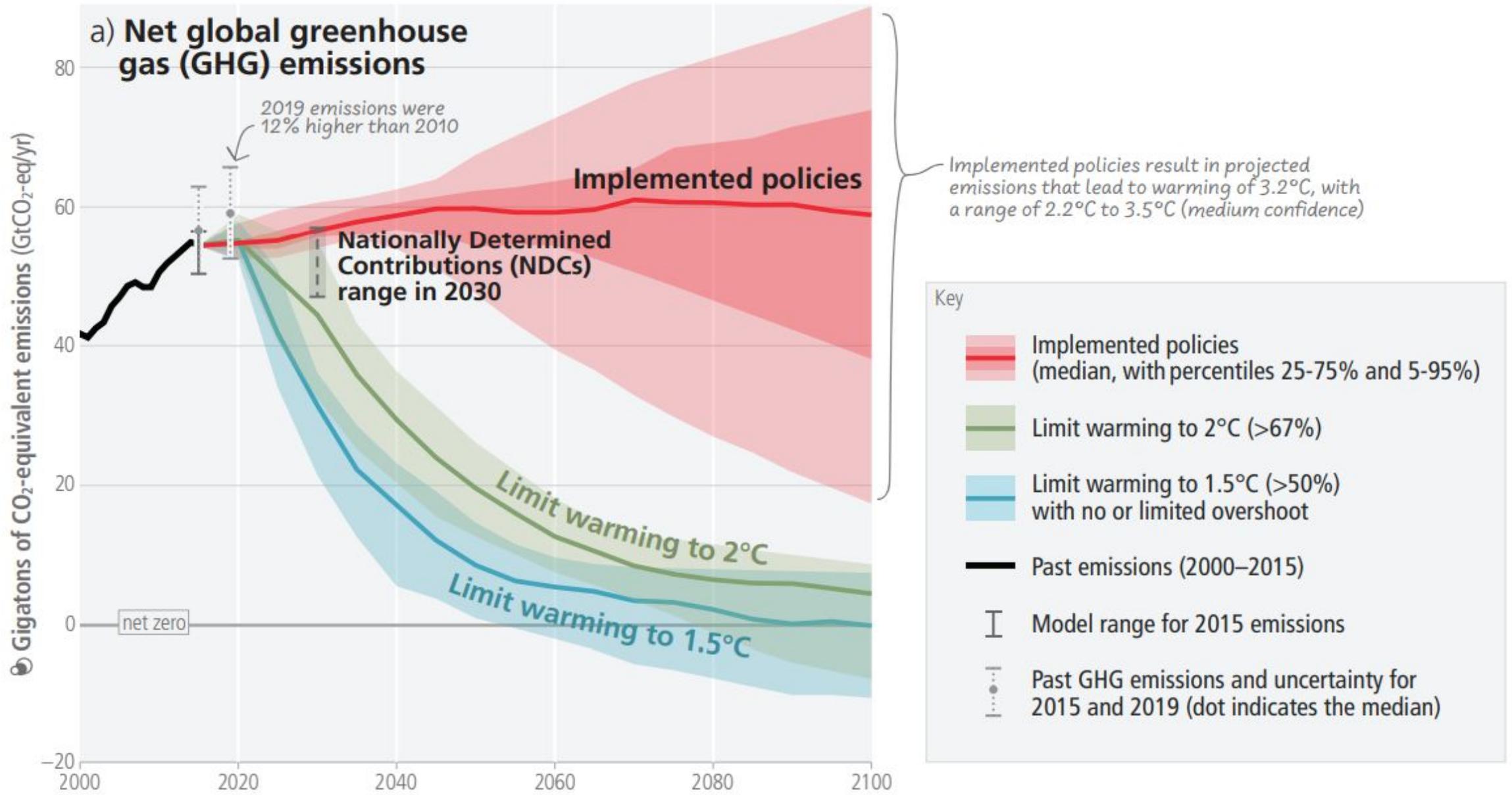
Regulations and Incentives

- Establish ambitious yet attainable criteria
- Encourage private companies to integrate emission reductions into their tender requirements.
- Establish a binding follow-up mechanism



An aerial photograph of a dense forest of evergreen trees, likely spruce or fir, with a mix of green and brownish-green foliage. The trees are packed closely together, creating a textured canopy. The lighting is soft, suggesting an overcast day or late afternoon. The overall tone is natural and serene.

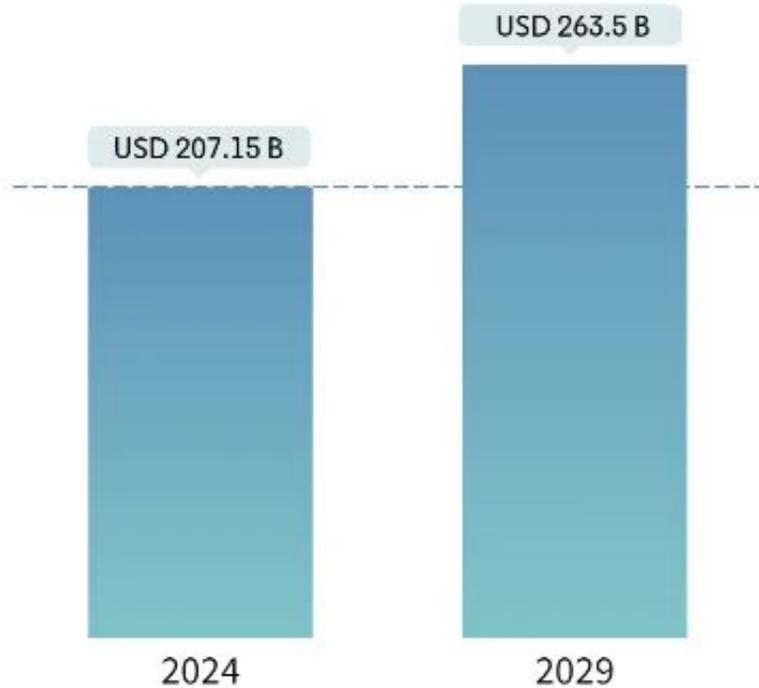
**“The most sustainable building
is the building that is not built”**



Scandinavia Construction Market

Market Size in USD Billion

CAGR 4.93%



Source : Mordor Intelligence



Study Period	2020 - 2029
Base Year For Estimation	2023
Market Size (2024)	USD 207.15 Billion
Market Size (2029)	USD 263.50 Billion
CAGR (2024 - 2029)	4.93 %
Market Concentration	Medium

Major Players



*Disclaimer: Major Players sorted in no particular order



Clean energy does not exist

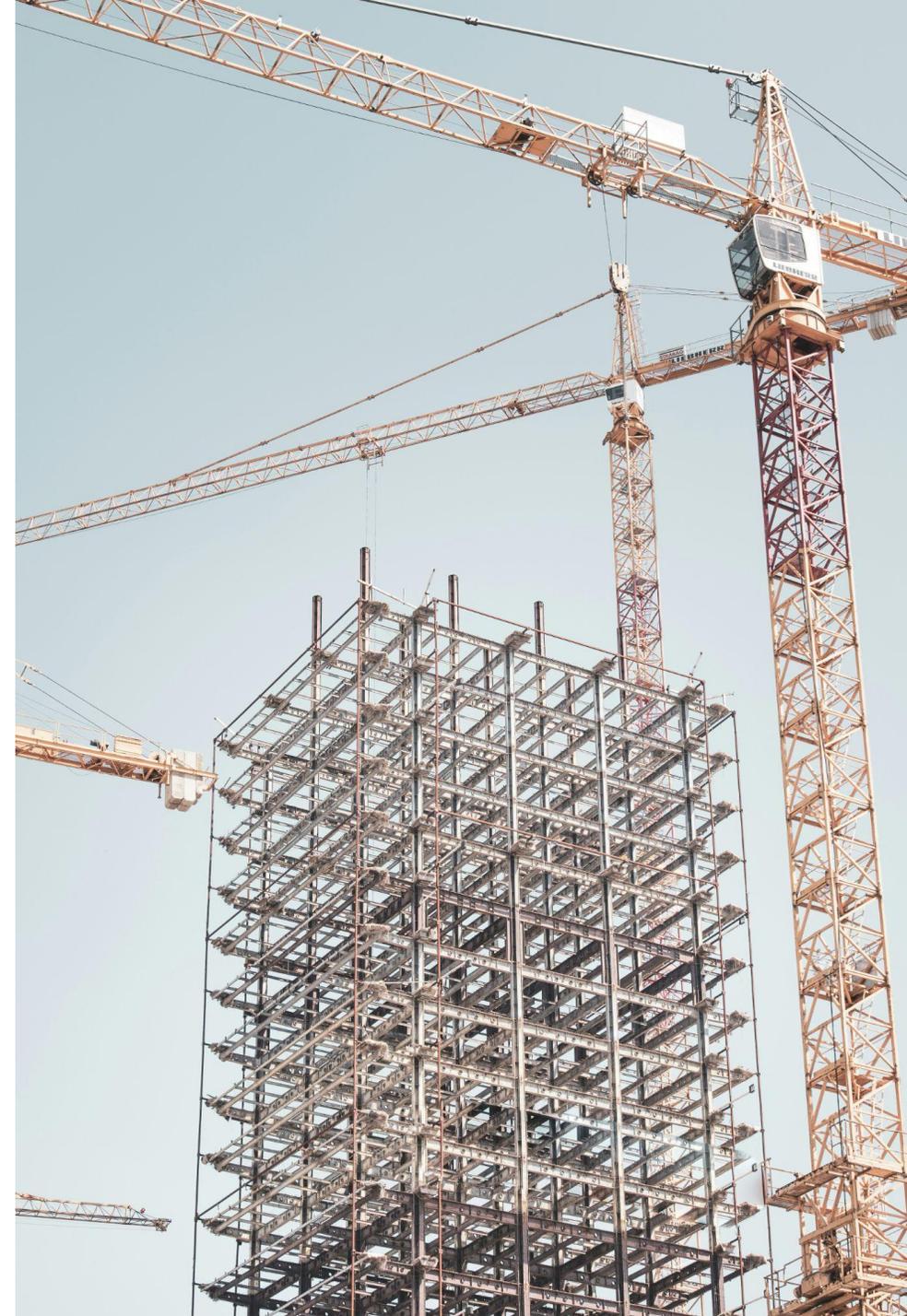


Sustainability

- Measures that can be implemented at construction sites to deliver results quicker.
- Consider the negative consequences of changing resource use in construction projects.
- Increase the industry's interest in degrowth thinking.
- Identify ways to translate Planetary Boundaries into specific reduction targets.



Questions - Slido



Thank you!

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Programme partners



Ministry of the
Environment Finland



**Nordic
Innovation**

Form
Design
Center /



Government of Iceland
Ministry of Infrastructure



**danish housing
and planning authority**

