Ympäristöministeriö
Miljöministeriet
Ministry of the Environment

Arctic strategy of Finland in bioeconomy, wood building and circular economy

Arctic Wood Building and Circular Economy Forum
Simon le Roux
Kemi 24.5.2018

Nordic strategy

NORDIC SYNERGIES

Nordic societies have to become climate-neutral and toxin-free at the same time as they minimize resource use.

Facing challenges and a need for collaboration:

- Climate change
- Biodiversity loss
- Chemical harrassment in daily life

We are facing major changes in the production and consumption systems upon which our societies are built.

Nordic countries in the green transition

Strategic recommendations for Nordic co-operation

- Develop and implement an action plan for co-operation in order to achieve a **low-carbon society by 2050**
  - In order to meet climate-change targets, we must focus on tangible results in the transition to a low-carbon society.
  - Key themes to do with **climate neutrality, climate legislation, construction and housing, climate-neutral communities, energy, and trade-offs between climate and biodiversity.**

The Nordic countries in the green transition – more than just neighbours. Tine Sundtoft
Strategic recommendations for Nordic co-operation on the environment and climate in the run-up to 2030
Nordic Council of Ministers 2018 http://dx.doi.org/10.6027/ANP2018-752

Learning from plastic

Nordic forum on a toxin-free, circular economy

- The Nordic economies of the future should be based on a **circular rather than linear consumption of resources**.
- The lessons learned from the work on plastics could be applied to Nordic co-operation on other material flows where a need for greater circularity is identified.

EU chemicals legislation remains a priority for Nordic environmental co-operation

- substitution of problematic substances and hazardous chemicals where their use creates a risk for the environment and human beings.

Taking the lead in green solutions from a social and economic perspective

Build awareness of the benefits of a green transition in terms of the economy, health and quality of life

- Promoting exports of Nordic green solutions
- Nordic countries possess technologies and solutions that the world needs in order to be able to adapt and to meet the Paris Agreement targets and the UN Sustainable Development Goals:
  - **Nordic solutions for sustainable cities**
  - **Sustainable environmental management**
  - **Climate change adaptation**
  - **Circular economy**

Promoting the demand for a transition

Public procurement

- Public-sector funding schemes, public procurement and subsidies for major infrastructure projects have great potential for promoting the development, commercialization and implementation of green solutions.

Ecolabels and environmental certification

- Supporting the Nordic Ecolabel
- Environmental certification of buildings
- Consumer products
- Use of ecolabelling within public procurement

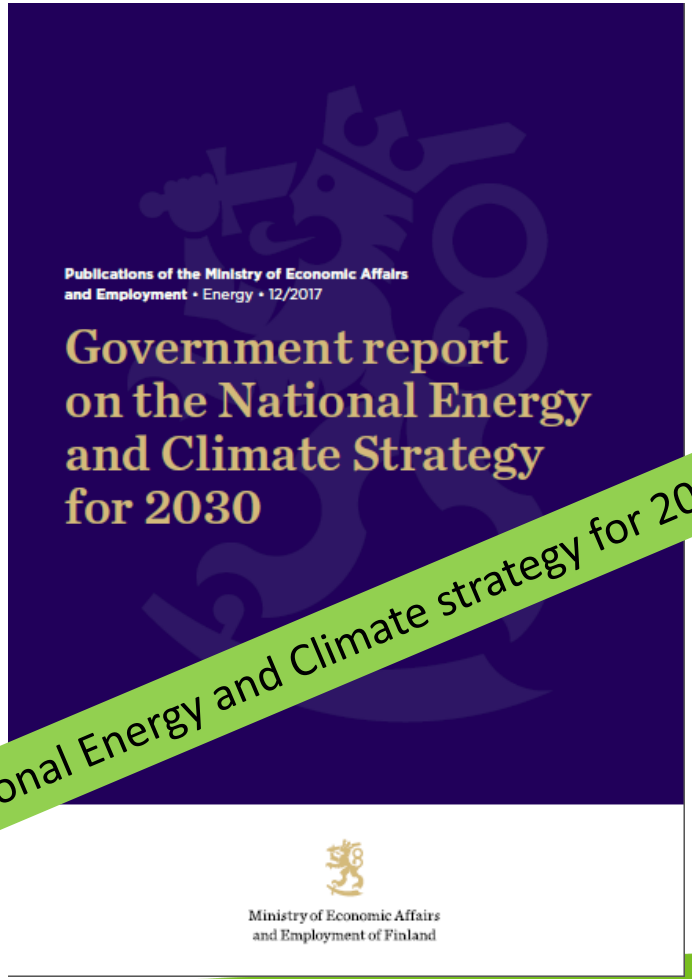
HankintaKEINO: Competence centre for sustainable and innovative public procurement

Nordic action plan for climate resilience of ecosystems and diversity in nature

Climate change increases pressure on our ecosystems and their foundation: biodiversity

- Human and economic activities such as agriculture, forestry, fisheries, town planning and infrastructure expansion are putting great pressure on ecosystems and their resilience.
- Healthy, robust ecosystems are better able to withstand the effects of climate change.
- Identify common areas of concern in Nordic nature, such as Arctic and coastal areas

National strategy



National Energy and Climate strategy for 2030

”Promote wood construction for long-term carbon storage”

”Reduce the carbon footprint of construction materials”

”The material efficiency of construction will be improved”

”Procurement instructions to reduce the carbon footprint of construction”

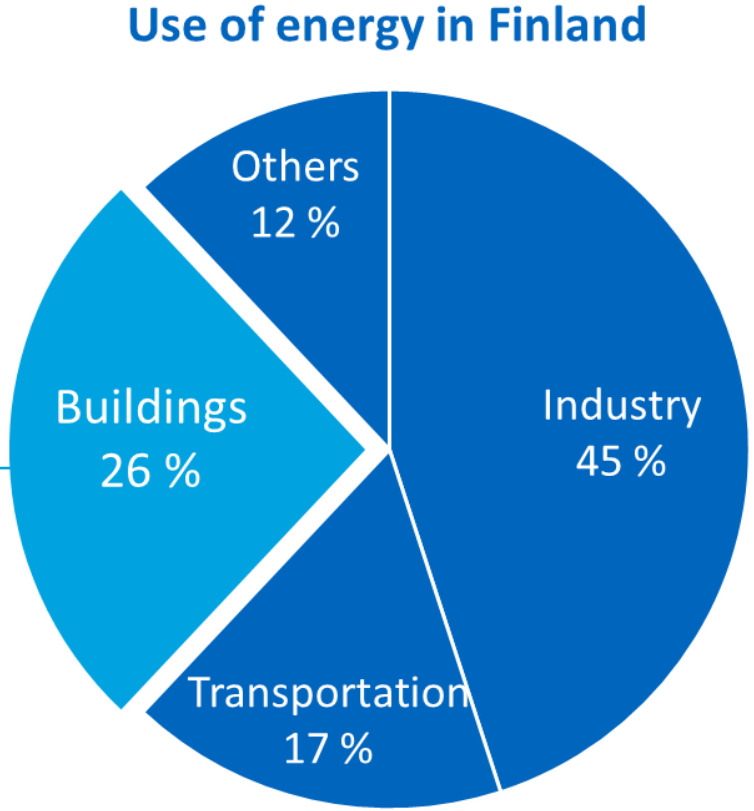
Carbon neutral by 2045

Leader in circular economy by 2025

Carbon neutral by 2045

Nearly zero-energy buildings

2020



Towards a sustainable built environment

2018

Nearly zero energy buildings

2025

Life cycle carbon footprint

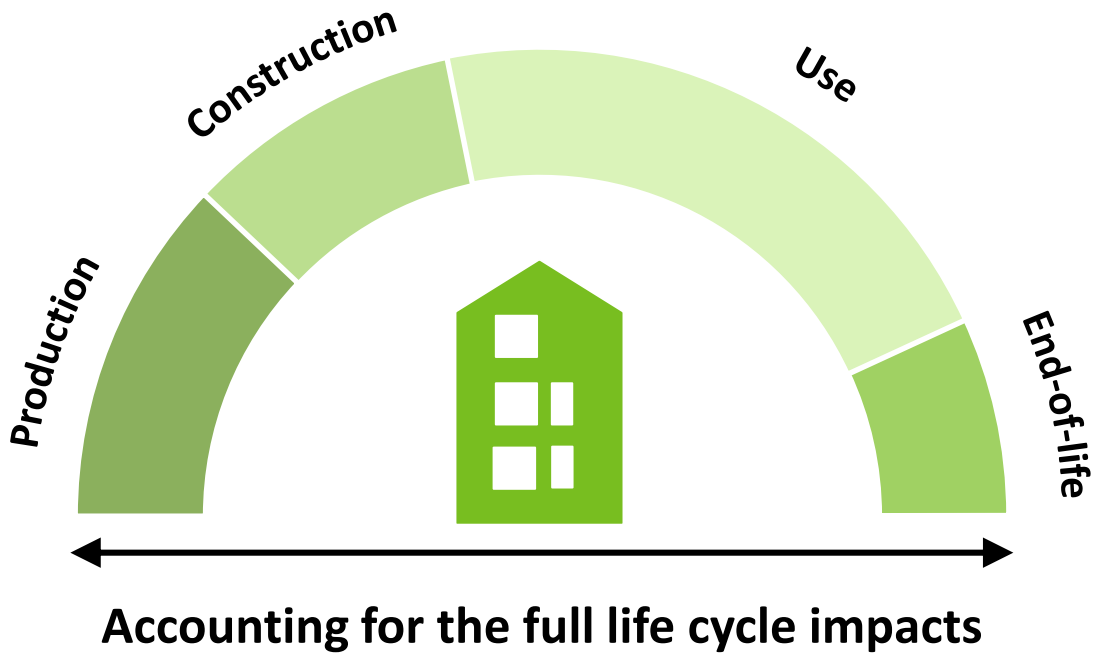
20??

Other life cycle impacts

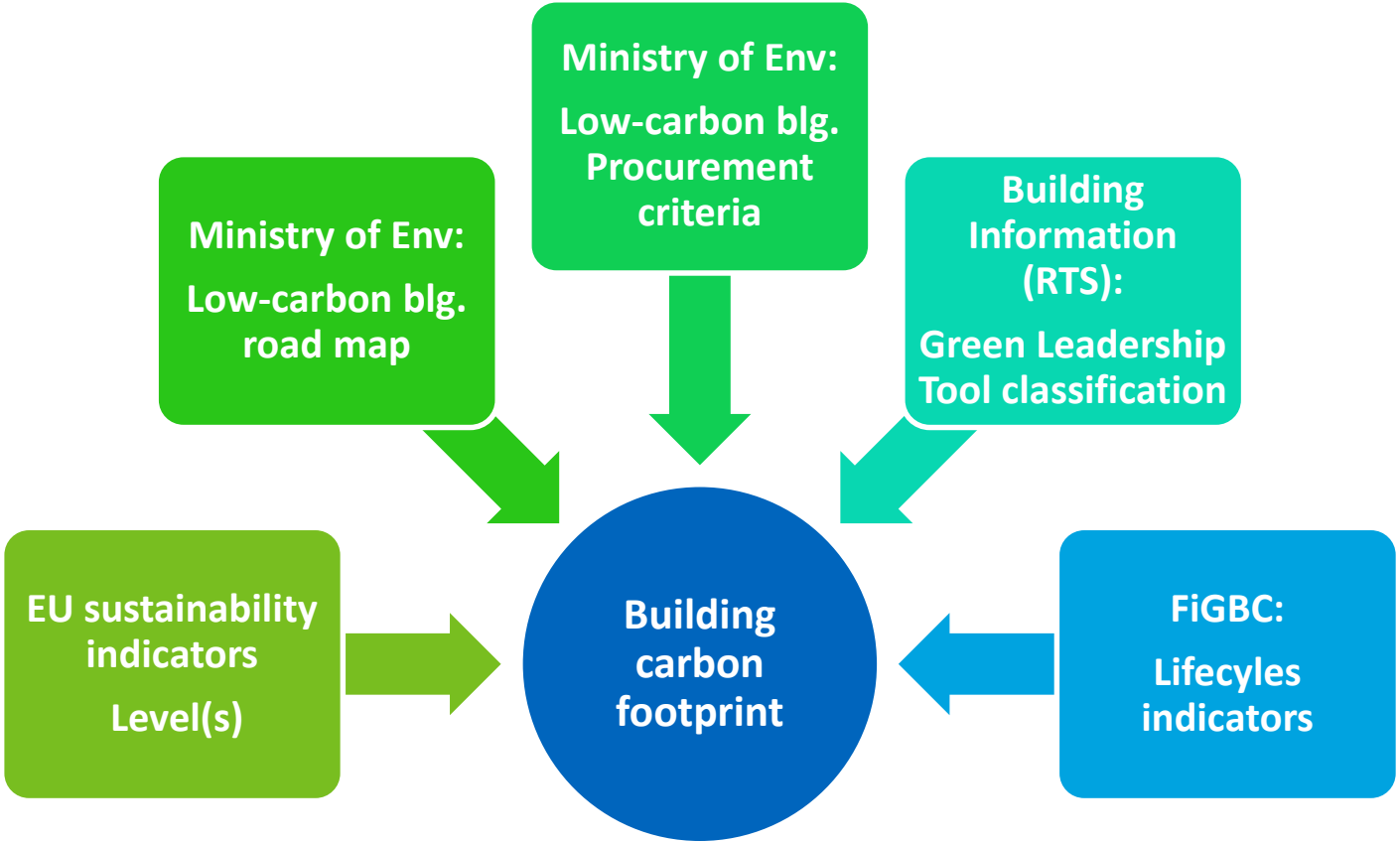
In nZEB regulation the focus is on operative energy use

We are widening the scope to embodied energy and emissions

Normative development to include life cycle assessment into building regulations



- Assessing the impact, compatability and implementation of regulations
- Testing calculation methods



ym.fi/vahahiilinenrakentaminen

Guidance to procure low-carbon buildings

Green Public Procurement (GPP) criteria to reduce the carbon footprint of building projects:

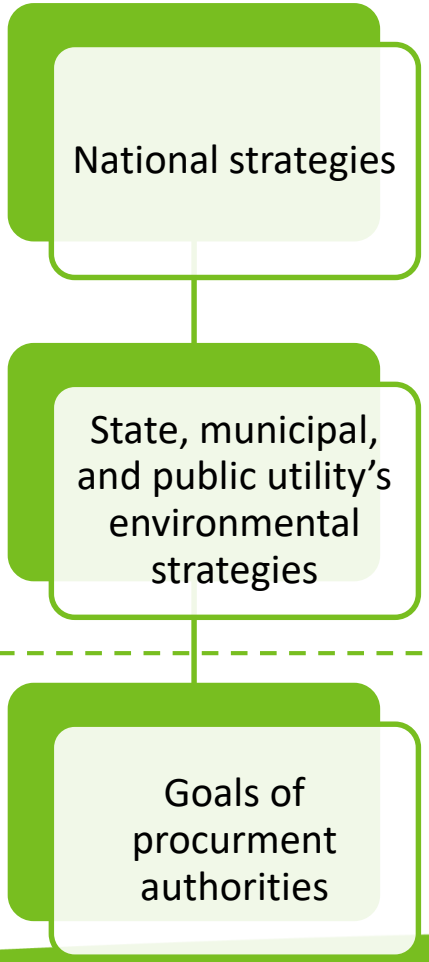
- Lifecycle thinking should be applied during the planning of buildings with calculations of the lifecycle carbon footprint of the building.

Criteria still needed:

- Commissioning carbon neutral buildings
- Managing carbon budgets of construction project

Environment Guide of the Ministry of the Environment
Matti Kuittinen, Simon le Roux, 2018 (in English)
http://urn.fi/URN:ISBN:978-952-11-4788-3

Strategic mandate for procurement



- National Energy and Climate strategy
- Goverments decisions in principle
- Action plan for Sustainable urban development

- **E.g. low-carbon, cleantech, bioeconomy, innovations**

STRATEGY

PROCUREMENT UNITS

- Procurement organization acts in line with approved environmental strategies

EU sustainability indicators recognizing the carbon footprint and material efficiency

Level(s)
Building sustainability performance
#BuildCircular

http://ec.europa.eu/environment/eussd/buildings.htm

Finland's action plan for sustainable urban development

Low-carbon cities

- Low-carbon approach
- Circular economy, efficient use of resources
- Sustainable food system, nutrient cycles, locally produced food
- Wood construction
- Innovative and sustainable public procurement

Smart cities

- Transport and sustainable mobility
- Smart infrastructure and smart energy
- Smart services and service chains

Socially inclusive cities

- Combating segregation
- Narrowing inequality

Healthy cities

- Healthy indoor and outdoor spaces
- Green spaces and recreation, ecosystem services, nature-based solutions
- Accessibility

Arctic concepts

Regional concepts for Arctic construction

- **Planning a carbon neutral settlement**
- Understanding the infrastructure, heritage and culture of Arctic communities
- Compensating anthropogenic greenhouse gas emissions through the recognition, development and preservation of regional natural and man-made carbon sinks
- Traditional knowledge meets modern construction technologies

Designing carbon neutral Arctic buildings

- **Carbon neutral over their full life cycle**
- Optimization based on life cycle assessment
- Consideration of the embodied impacts of building materials
- Energy efficiency and the use of renewable energy
- Anticipatory service life planning

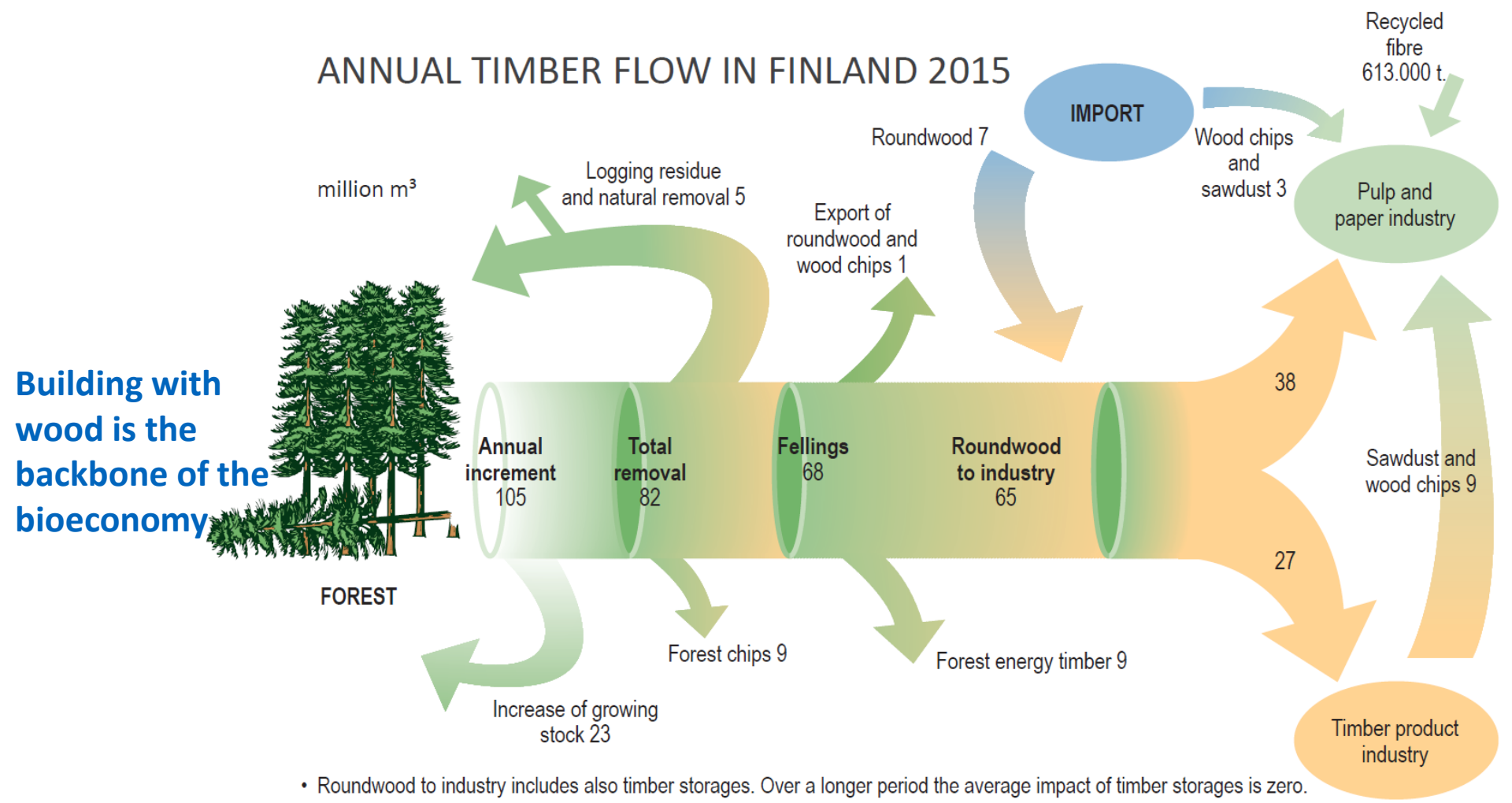
Indoor environment of Arctic buildings

- **During dark periods of the year, the quality of indoor environment has great impact on human well-being**
- Moisture, material or maintenance related problems increase health risks
- Exploit the hygrothermal properties of wood for indoor climate control with moisture buffering
- Wood can decrease humidity changes in indoor air
- Coatings influence significantly the sensation of materials

bioeconomy

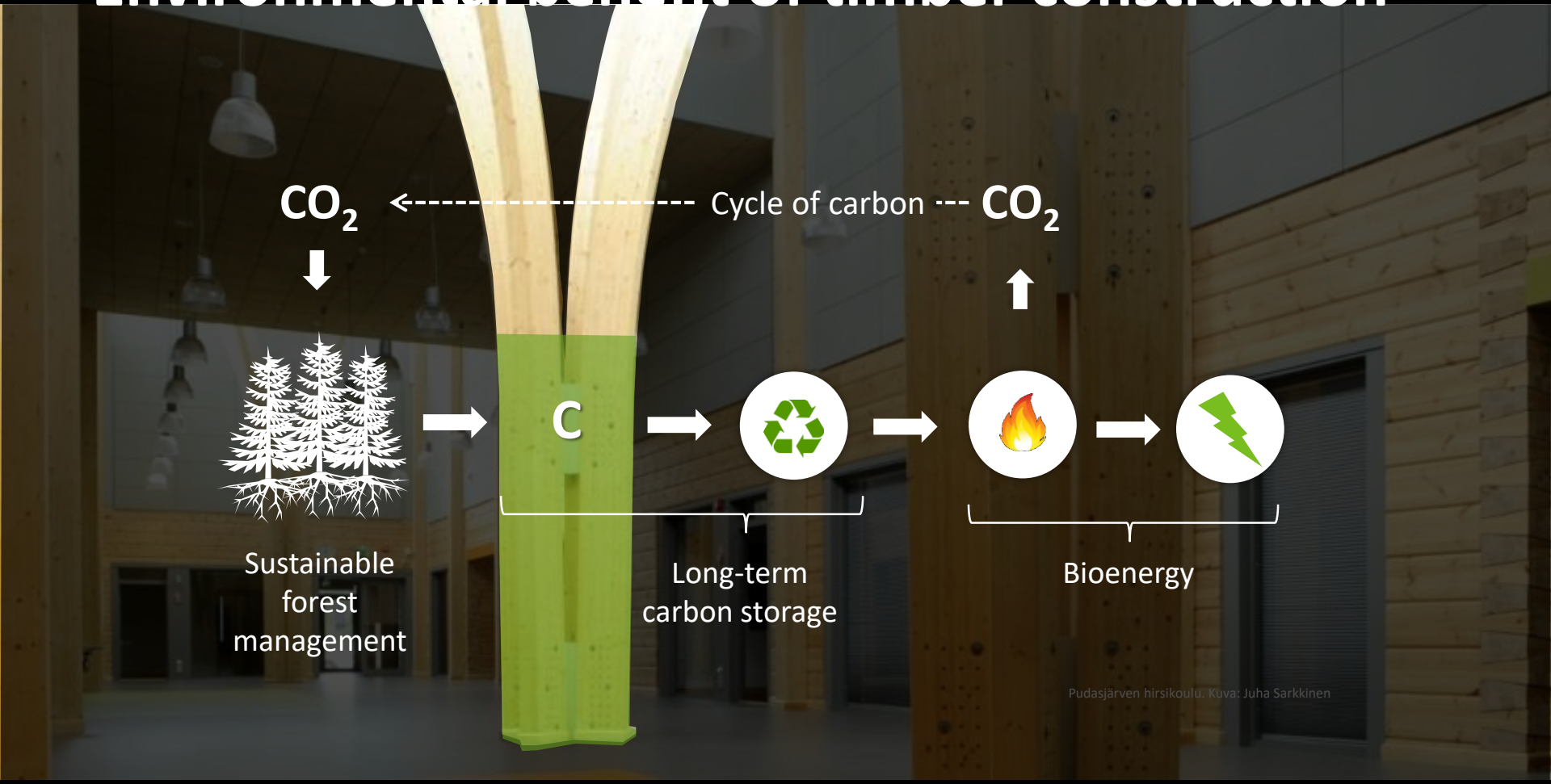
Tales of Humans and Trees in Long-Term Partnership

Building with wood is the backbone of the bioeconomy



- Roundwood to industry includes also timber storages. Over a longer period the average impact of timber storages is zero.
- Source: Natural Resources Institute Finland (stat.luke.fi) and NFI, Finnish Forest Industries. Updated 24.04.2017.

Environmental benefit of timber construction



Energy efficient massive wooden buildings

Massive wooden buildings have typically low embodied energy and emissions.

Massive wooden structures lower heating and cooling demand in the Finnish climate.

Wood is renewable and can be reused or recycled several times.

Wood stores bioenergy that can be used for substituting fossil fuels.

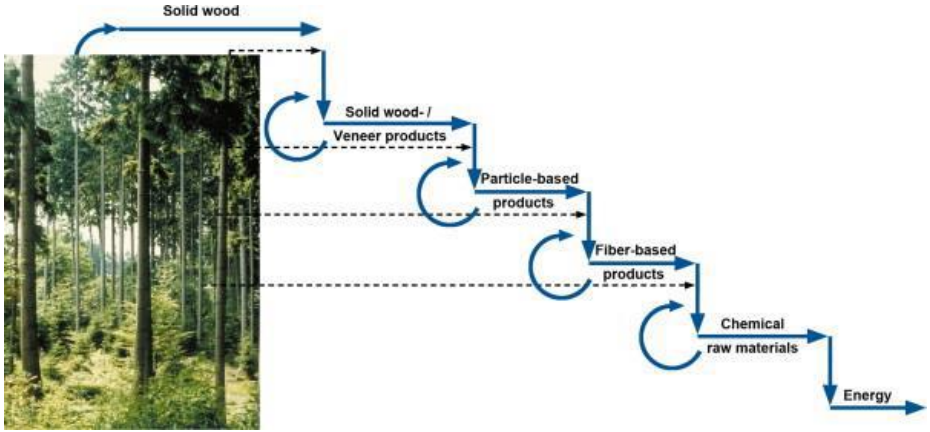
Pudasjärvi school
Photo © Juha Nyman

circular economy

Material efficiency and circular economy
Extended product life and wood cascades

- How do we maximize the substitution and carbon storage benefits of wood products in construction?

- Increase the longevity of existing buildings
- Reuse components in other buildings
- Reuse the materials from which the elements or components are fabricated
- Wood materials themselves can be recycled into new components or elements
- After demolition the wood material could enter the biorefinery process
- **Recover the material in as near to intact form as possible after every step**



REWOOD: A Paradigm Shift in Building Construction in Wood
Mark Hughes, Minna Halme & Gerhard Fink
Aalto Sustainability Day, 18.5.2018

useful ways to talk


Lifecycle
impacts
Quality,
Perform,
Value

Climate change

Economy

Natural resources

Society

Low carbon,
Energy efficient

Adapt, Resilience
Lifecycle

Protect,
Resources

Responsibility,
Health, Safety

Emission targets
Low-carbon construction
Lifecycle analysis (LCA)

Environmental management
Space use adaptability
Climate change mitigation and adaption

Energy efficiency
Energy renovations
Renewable energy
Thermal comfort

Life cycle costs (LCC)
Local economy ja innovations
Maintain and repair
Useability

Land use planning
Environmental risks
Environmental protection
Urban ecology & green infra

Public services
Accessibility
Access to services
Responsibility

Resource efficiency
Waste and Water management,
Circular economy
Service life

Health
Safety
Indoor quality
Aesthetic quality

Wood Building Program

Wood Building Program of the Finnish Government

Program administered by the Ministry of Environment:

- Wood construction will be promoted in line with the actions set out in the National Energy and Climate Strategy.
- Funding: Bioeconomy and Clean solutions Key Project (2016-2018), Energy and Climate Strategy (2018-2021)

Goals:

- Promote the growth of internationally competitive industrial wood construction know-how and production in Finland
- Promote the long-term carbon strorage in timber structures and support the responsible use of forest resources.

Quantitative targets:

- 10% annual increase in the production of wooden apartment buildings
- Increase the the carbon storage in wood products in the building stock
- Annually increase the industrial use of timber in construction
- Increase the number of public developers actively building with wood
- Increase the export of wooden building products

Emphasis of activity in the Wood Building Program for 2018

Know-how

Further education in advanced timber structures

Training for building authorities

Public procurement

Guidance for wooden school buildings

Procurement tools

Carbon footprint

Level(s) core indicator piloting

Road map to low-carbon buildings

Cities

Commitments to build with wood in growth centers

Competitions

Company grants

Digitalization

R&D

www.ym.fi/puurakentaminen

Thank you!
Wood Building Program

Petri Heino
Simon le Roux
Jemina Suikki

petri.heino@ym.fi
simon.leroux@ym.fi
jemina.suikki@ym.fi
ym.fi/puurakentaminen