How can wood build a sustainable future?

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Key take aways from today

1

Timber is an environmentally friendly construction material and has a bright future ahead…

2

…**When sourced sustainably**: key differentiating factors in the value chain

3

Continuous technical development enable more use cases for wood

Source of all information in this presentation is UPM, unless stated otherwise

Timber is an excellent construction material from a carbon balance point of view

	Timber	Steel	Aluminium	Concrete
Carbon tied / released during physical process	- ~400 kg C	+500 kg	+500 kg	+100 kg
Energy per kg to process to ”raw material state”	0.4 MJ / t	23.5 MJ / t	50 MJ	1.7 MJ / t
Total net C02 per tonne	-0.7 – -0.9 tCO2/t	1.85tCO2 / t	4 – 18 tCO2 / t	0.2 tCO2 / t
Share of total Co2 emissions	negative	7%	4%	8%

Source: VTT (2013) https://www.vttresearch.com/sites/default/files/pdf/technology/2013/T115.pdf, author analysis

Many governments have policies in place to increase use of wood based construction

Norway
Norwegian Wood-Based Innovation Scheme

Finland
- Strategic Programme for Finland's Forest Sector
- 45% of new building volume to be wood by 2025

Canada
Wood first (BC, QC)

Switzerland
Switzerland's Wood Resource Policy and Wood Action Plan

France
Over 50% of public buildings to be built from biomaterials

Japan
Wood Use Points Programme (WUPP) – promotion of local timber

Source: UNECE- cited online: https://unece.org/fileadmin/DAM/timber/publications/SP-38.pdf

Yet the timber and forest industry also face stark criticism

Habitat damage?

Deforestation and soil erosion?

Destroying carbon sinks?

Ruining waters?

Yields are low – rest is burnt?

Leads to monocultures?


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Sustainable sourcing of timber: How to become even better?
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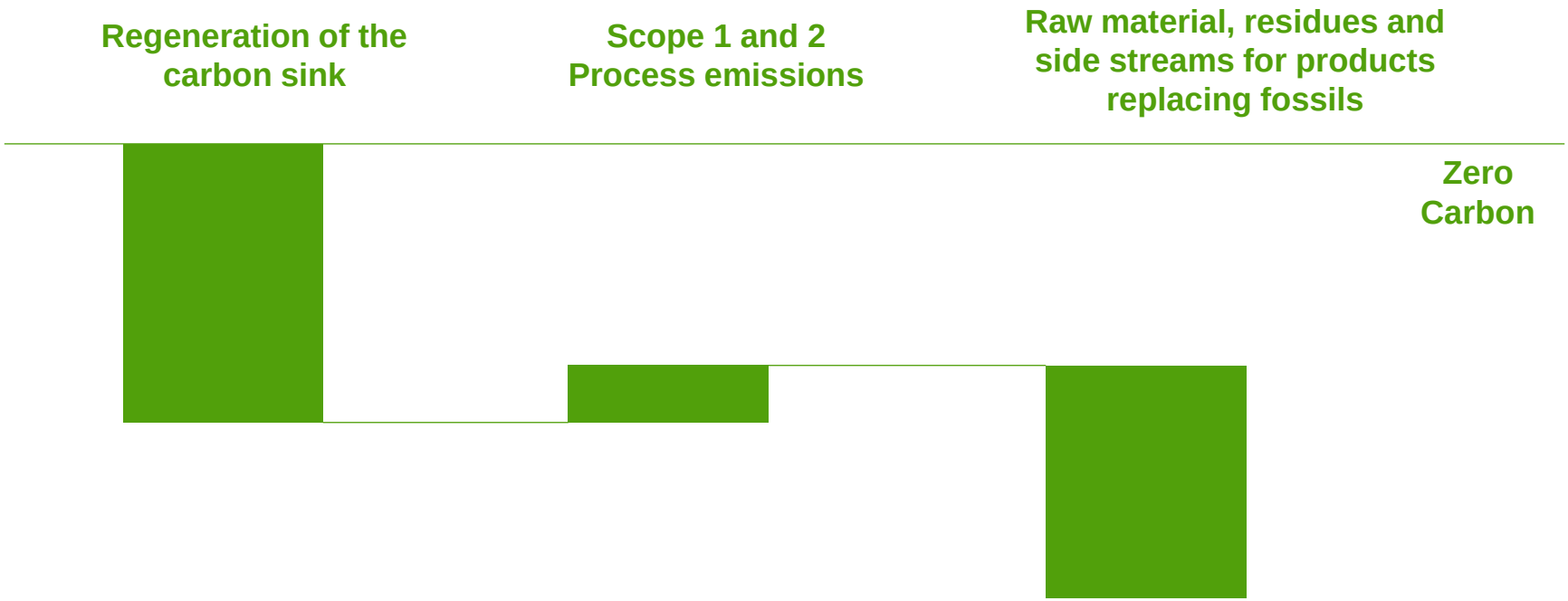
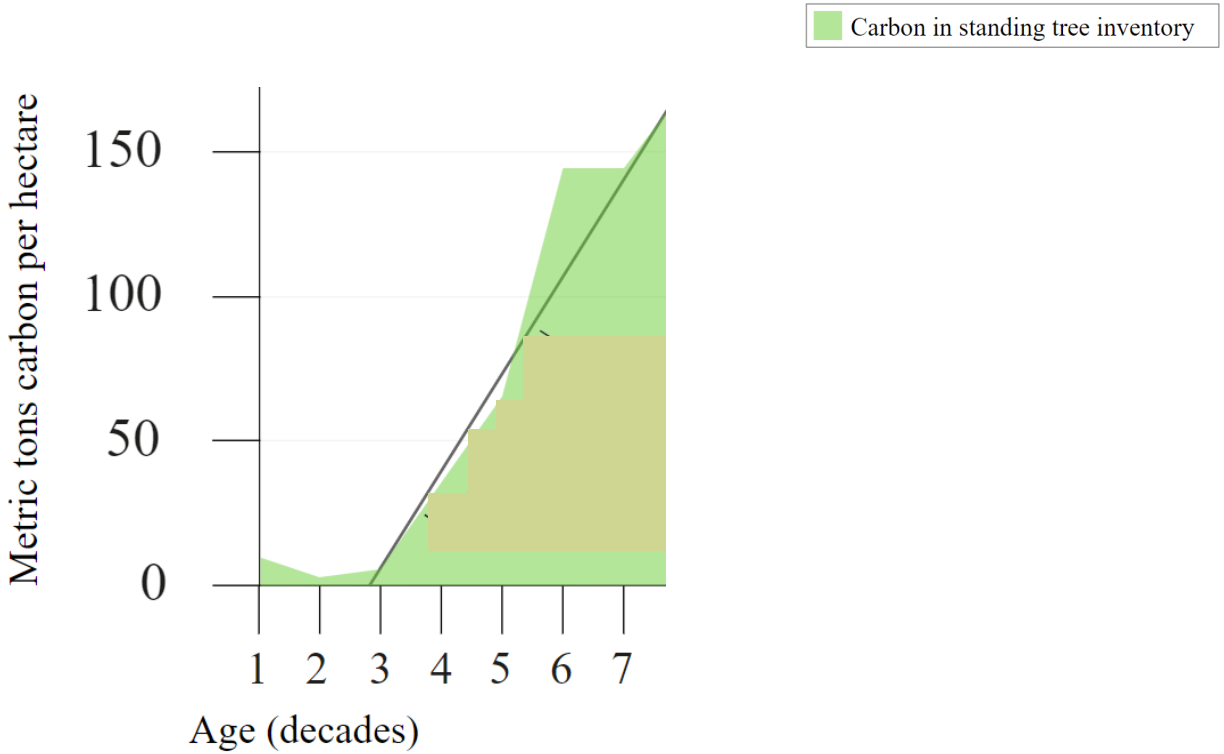
Our framework for making even better timber consists of three fundamental pillars



Foundation: Biodiversity - it also supports long term forest growth!

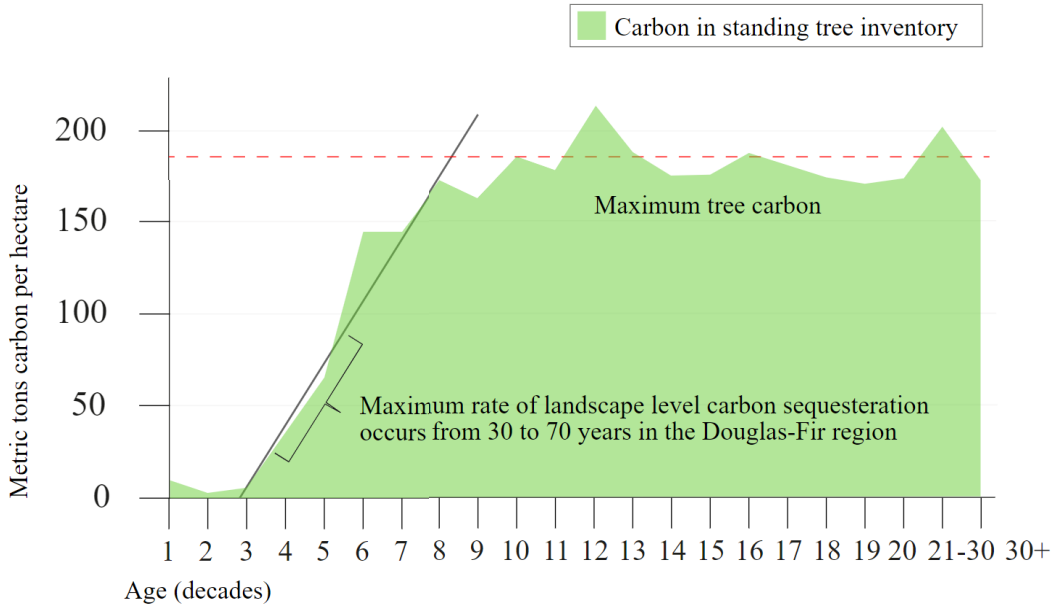
Lever 1: Make your forest the most effective carbon pump possible

Answer to the world's climate crisis? Leave forests to grow?



Source: Bruce Lippke, Elaine Oneil, Rob Harrison, Kenneth Skog, Leif Gustavsson & Roger Sathre (2011) Life cycle impacts of forest management and wood utilization on carbon mitigation: knowns and unknowns, Carbon Management, 2:3, 303-333, Cited online https://doi.org/10.4155/cmt.11.24

But we will need carbon sinks in the future too!



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We need to harness our forests (that are in economic use) to maximize their carbon sink properties

Enhancing forest growth possible by good forestry

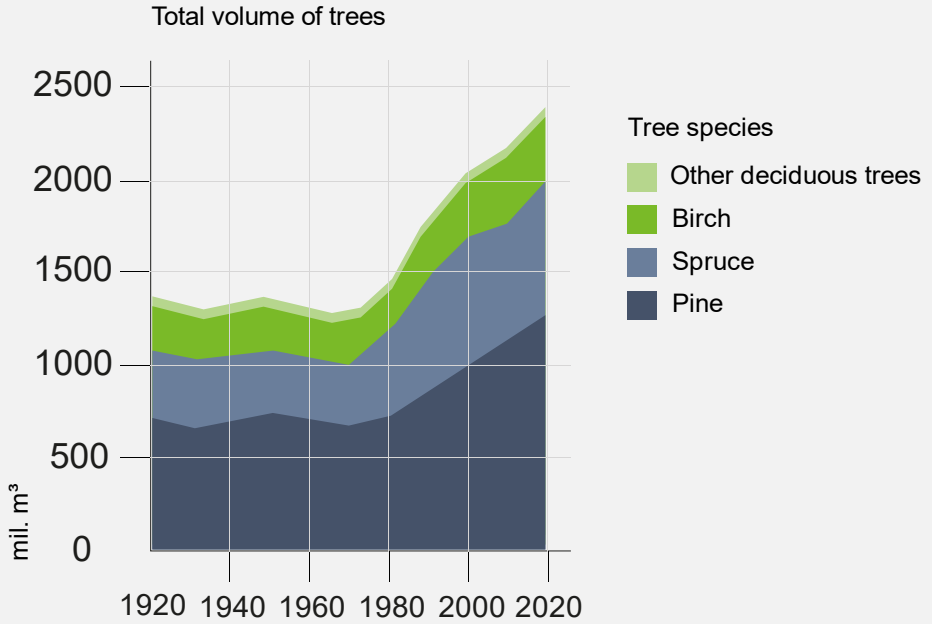
- Effective prevention of fires
- Optimal mix of species in the forest
- Effective forest regeneration
- Systematic harvesting
- Water management

Source: Bruce Lippke, Elaine Oneil, Rob Harrison, Kenneth Skog, Leif Gustavsson & Roger Sathre (2011) Life cycle impacts of forest management and wood utilization on carbon mitigation: knowns and unknowns, Carbon Management, 2:3, 303-333, Cited online https://doi.org/10.4155/cmt.11.24

Situation in Finland: Total biomass of forests continues to grow despite increasing harvesting due to systematic work

"I was with the president of Finland and he said: 'We have, much different, we are a forest nation.' He called it a forest nation. And they spend a lot of time on raking and cleaning and doing things, and they don't have any problem."

President Donald J Trump November 2018



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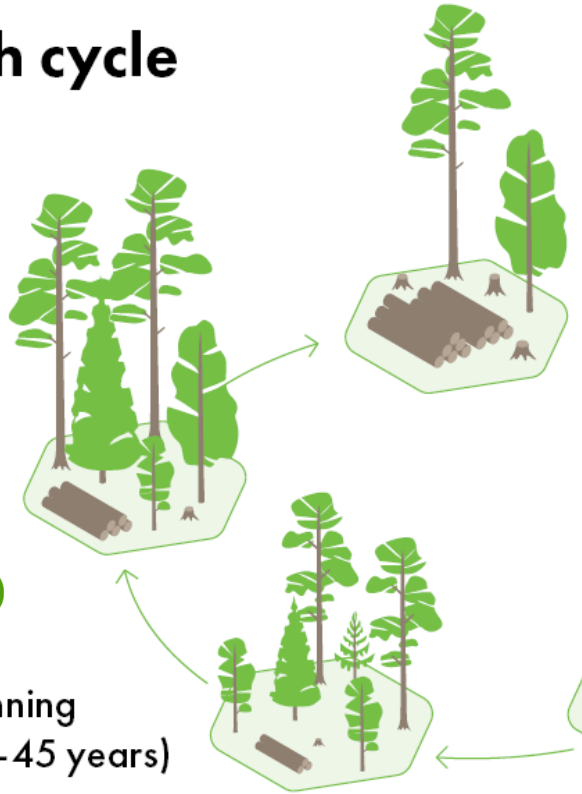
Forest growth cycle



Final (regeneration) felling
(between 60–100 years)
300m3/hectare

Planting a
new forest
1,800 seedlings

Seedling stand
management
(at 3–15 years)

First thinning
(between 20–45 years)
900-1,200 trees (100m3/hectare)

Second thinning
(between
45–65 years)
**500-600 trees
(200m3/hectare)**

UPM and forests: key figures

50M

Tree seedlings planted annually

27Mm³

Wood delivered globally to UPM mills annually

100%

Of wood and wood fibre from sustainable sources

82%

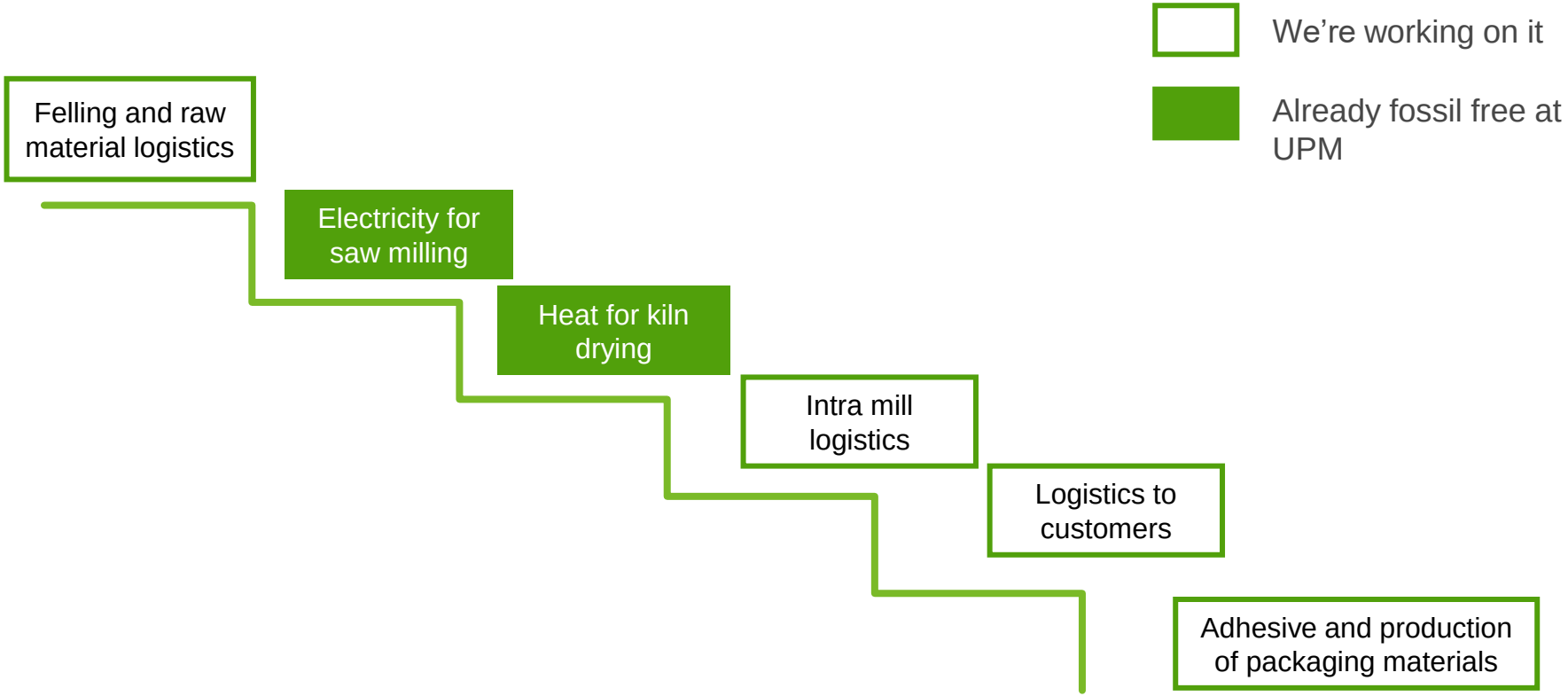
Of wood used in UPM products certified

FSC www.fsc.org FSC® C014719 The mark of responsible forestry

PEFC PEFC/02-31-80 Promoting Sustainable Forest Management www.pefc.org

Lever 2: Analyze and remove step by step your own process emissions

What causes process emissions in the sawn timber industry and related products?



Fossil-free production

0

All UPM timber is produced with zero fossil energy

10

We have met our CO_2 emission reduction targets ten years in advance

∞

Every product leaving our sawmills is ready to build a future beyond fossils

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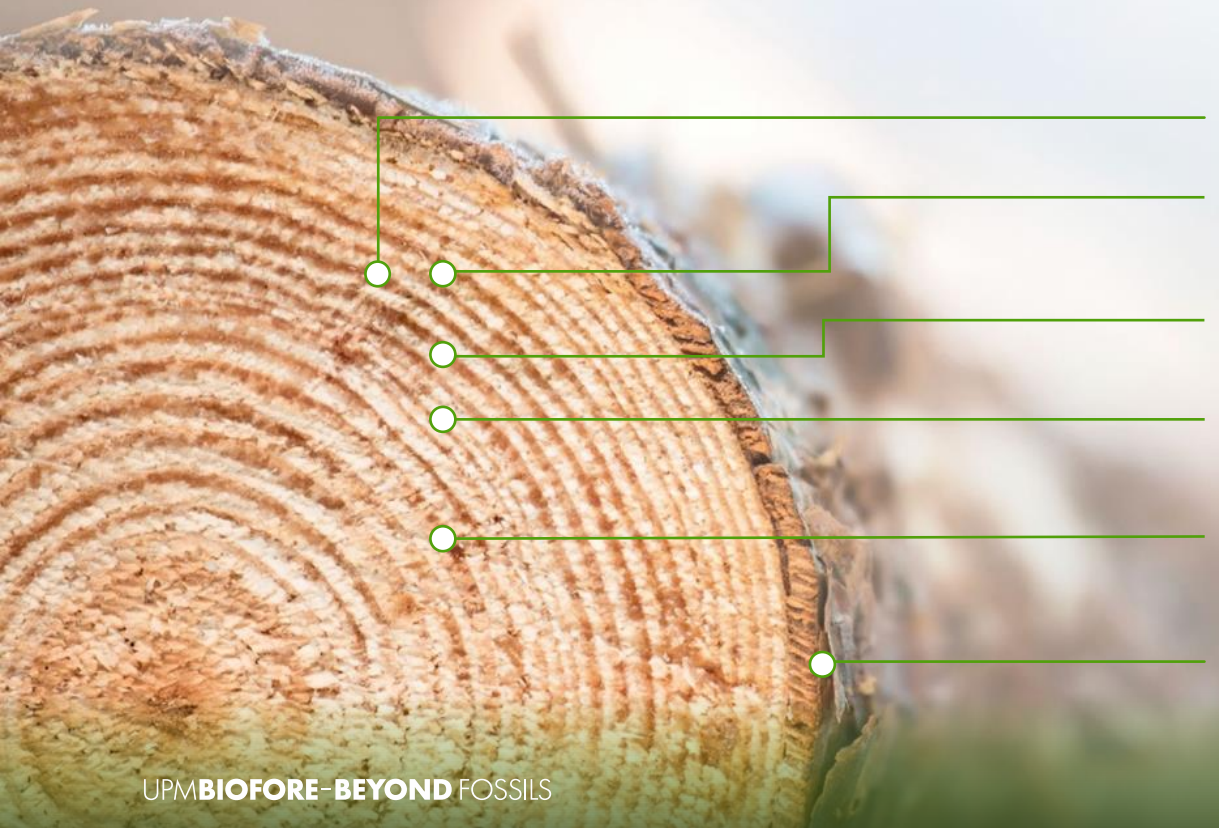
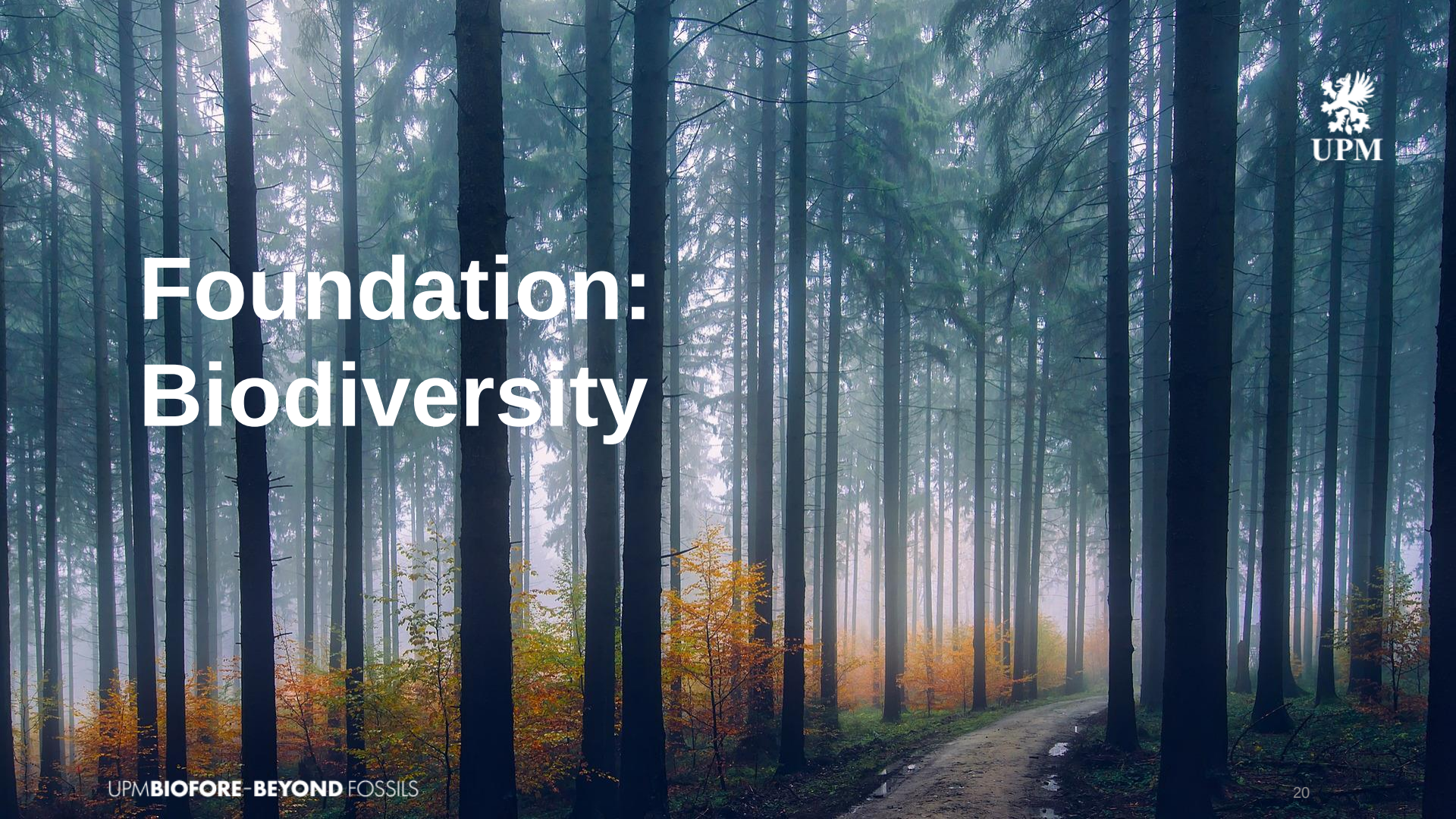
Lever 3: Eliminate waste and use side products to avoid fossil based materials

The **wide range of products** we make ensures **nothing** goes to **waste**



- Fibres to **pulp and paper**
- Fibres to **biofibrils and biocomposites**
- Logs for **sawn goods and plywood**
- Lignin, cellulose and hemicellulose to **biochemicals**
- Extractives to **renewable diesel and naphtha or biochemicals**
- Bark and branches to **energy**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UPM way: key elements for biodiversity

Native trees – ensuring diversified species composition in natural forests

Dead wood – increased volumes of decaying wood

Forest structure – ensuring diversified structural variation

Valuable habitats: protected biodiversity hot spots

Biodiversity indicators - Finland

Indicator	Target	Metrics
Tree species	Increase the broadleaved tree species volumes	Share of broadleeaved trees
Forest age	Maintain diverse forest age structure	Share of different forest age classes
Forest structure	Maintain and increase diverse forest structure	Share of alternative regeneration methods
Indicator development	Complement the set of indicators and develop monitoring with researchers	Create deadwood volumes and diversity monitoring for commercial forests. Biodiversity index and indicator development with external experts.
Protected areas	Improved nature conservation network	Nature conservation areas (protected areas/total hectares)
Valuable habitats	Protected valuable habitats with increased deadwood	Valuable habitats protected (protected habitat hectares/total hectares)
Habitat restoration	Improved biodiversity on restored environments	Existence of habitat restoration projects
Species and habitat projects	More joint stakeholder projects to protect biodiversity	Existence of species and habitat projects


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Wood is becoming an ever more versatile building material
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Recent developments in the timber industry which enable further use of wood in construction

- Growth in CLT, enabling further massive construction
- Further offering in structural strength
- Developments and variety in the superficial treatment of wood
- Thermowood as a more sustainable alternative to impregnation
- Fire prevention treatment materials

Example of fire proof wood: The Olympic Stadium Roof in Helsinki made from ”Kivipuu” (Source: Tammiston Puu)

Key factors to look for as a Timber buyer or end consumer

1. Quality = Longevity
2. The sourcing of the wood – certification and beyond
3. Practices of the forestry company; road map of own emissions and production of fossil substitute products

Sustainability is at the core of our operations at UPM Timber

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