



The Biofore Company **UPM**

WOOD SOURCING AND FORESTRY FINLAND

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Sourcing Manager





The Biofore Company **UPM**

- **Wood consumption and sources in Finland**
- UPM Wood Sourcing and supply-chain overlook
- Future outlook
- Sustainability and certification

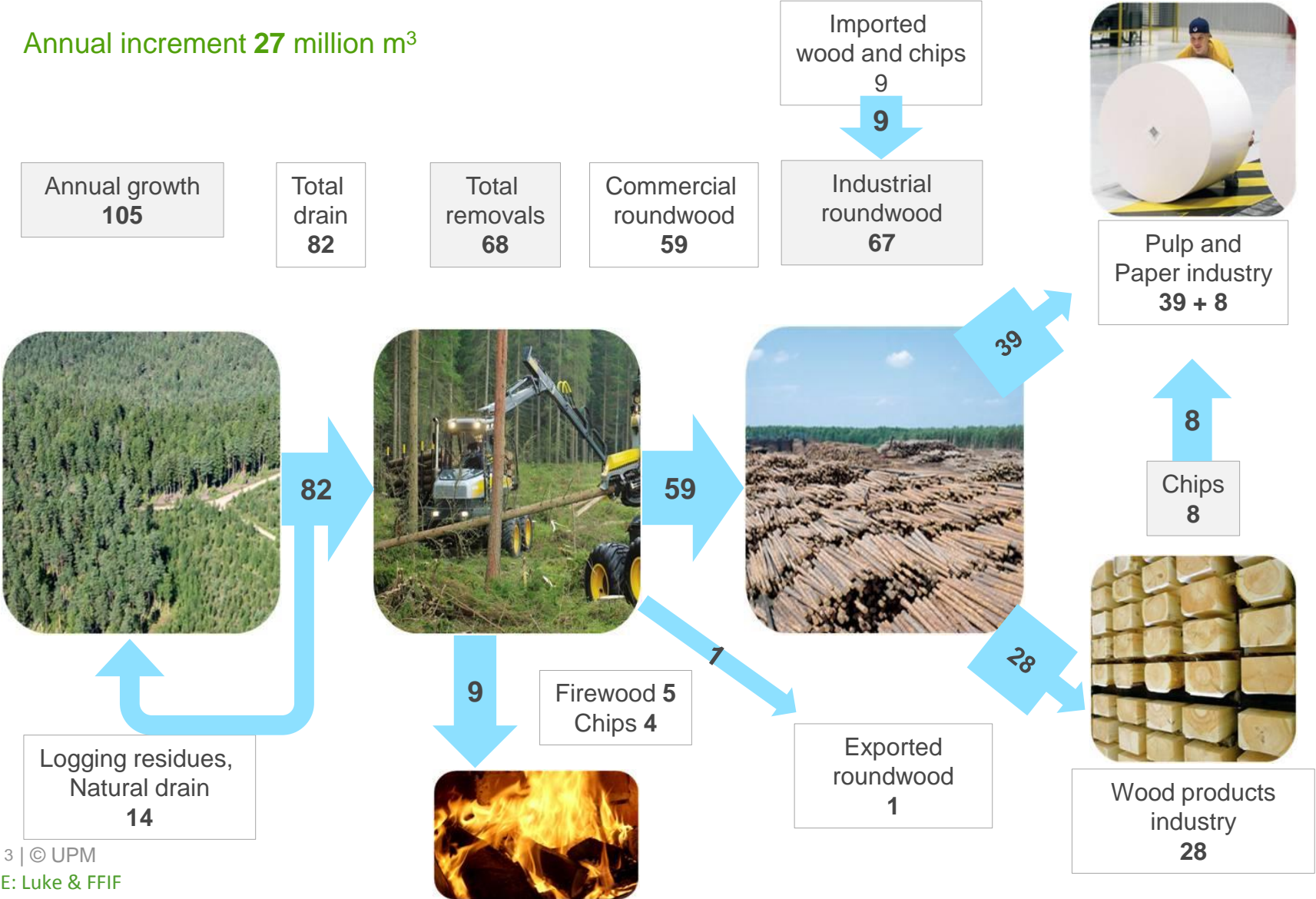
APPENDIX

- Forest owners & contractors



Wood flow from forest to mill in Finland 2016 (Mm³ sob)

- Annual increment **27 million m³**



BASIC PRINCIPLE IN FINLAND NO WASTE





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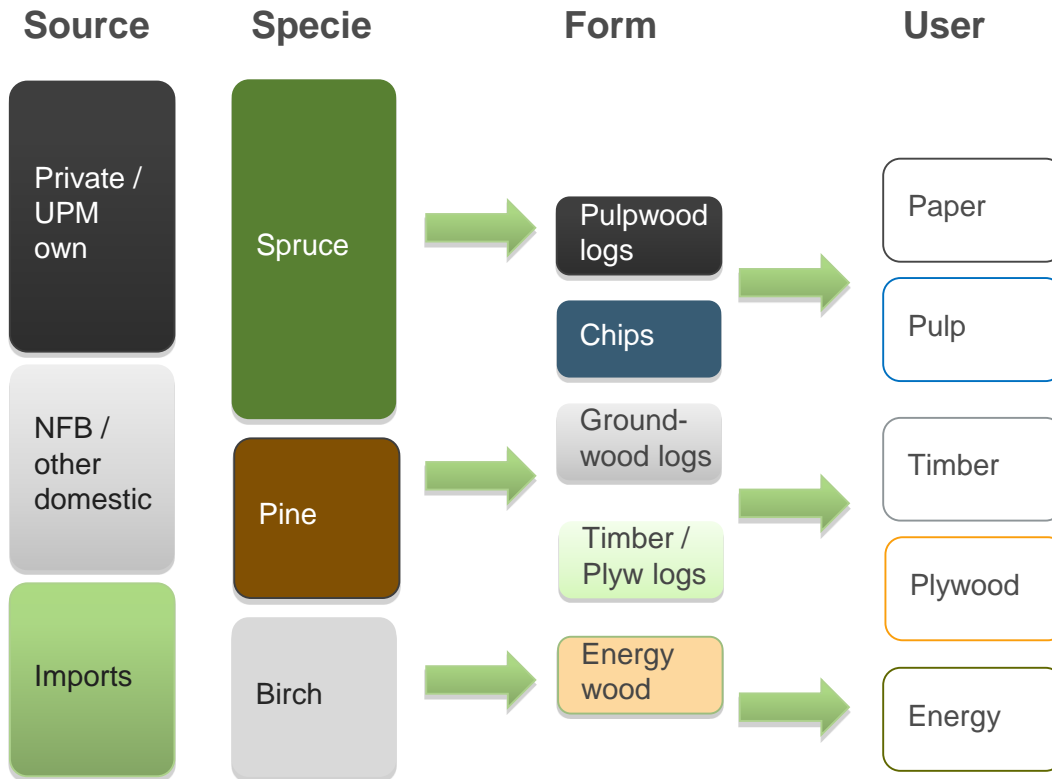
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Puzzle of **species** from various suppliers to multiple customers



Target to **optimize the whole** supply-chain

Customers with **different expectations** and needs in different market situation

Wood Sourcing and Mills, North Europe



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Wood Sourcing, North Europe

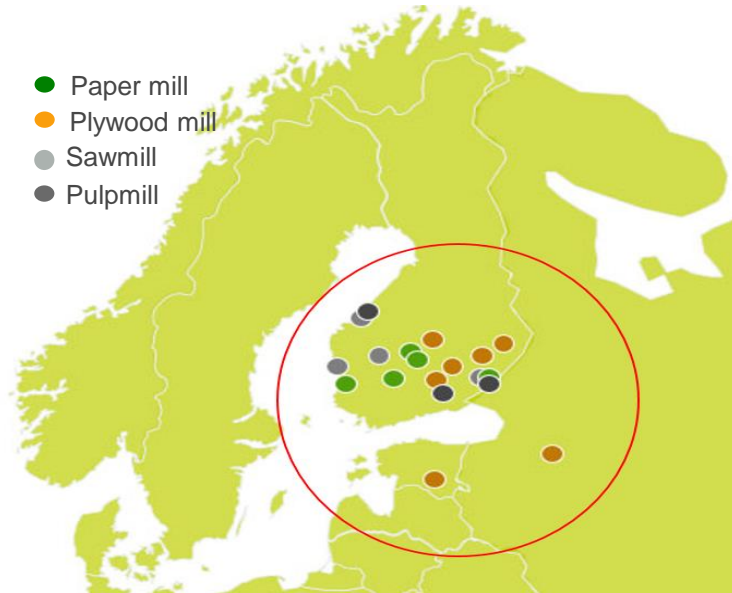
4 paper mills

3 pulp mills

7 veneer/ply mills

4 sawmills

8 own/co-owned energy plants



Wood Sourcing and Forestry, NE & mills using wood as raw material

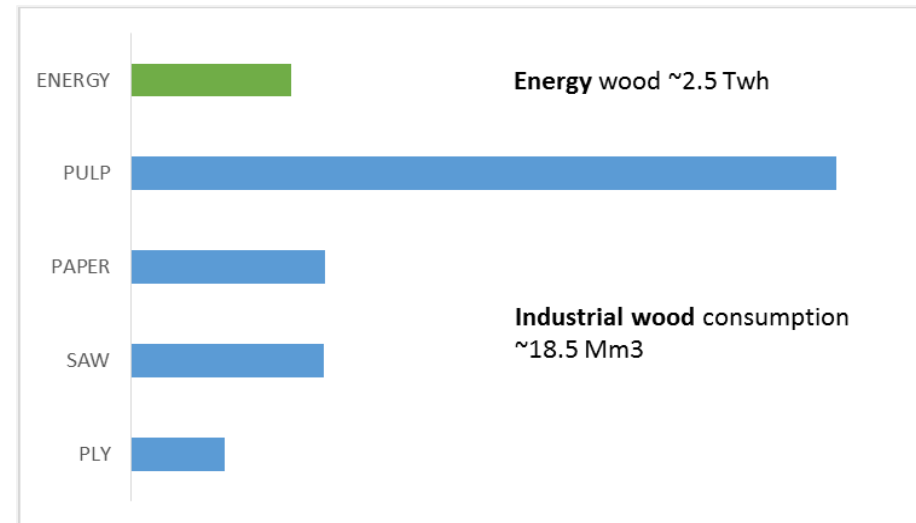
~18 Mm³ wood and 2.5 TWh of energy wood to UPM mills in Finland annually

~50% from Finnish private forest owners

~30% from B2B partners

<10% from UPM owned forests

>10% import (Russia and the Baltics)



WOOD SOURCING AND FORESTRY, FINLAND

Managing the whole value chain from seedlings to wood supply to the mills



- 650 forest professionals working in 120 locations
- Managing 700,000 hectares of UPM owned forests & ~1 M hectares of private forests



Tree nursery
- In Joroinen
- 35 employees

Forestry
- UPM Silvesta, 82 persons
- Abt. 170 entrepreneurs

Wood purchasing
~25,000 wood purchase contracts with private forest owners annually

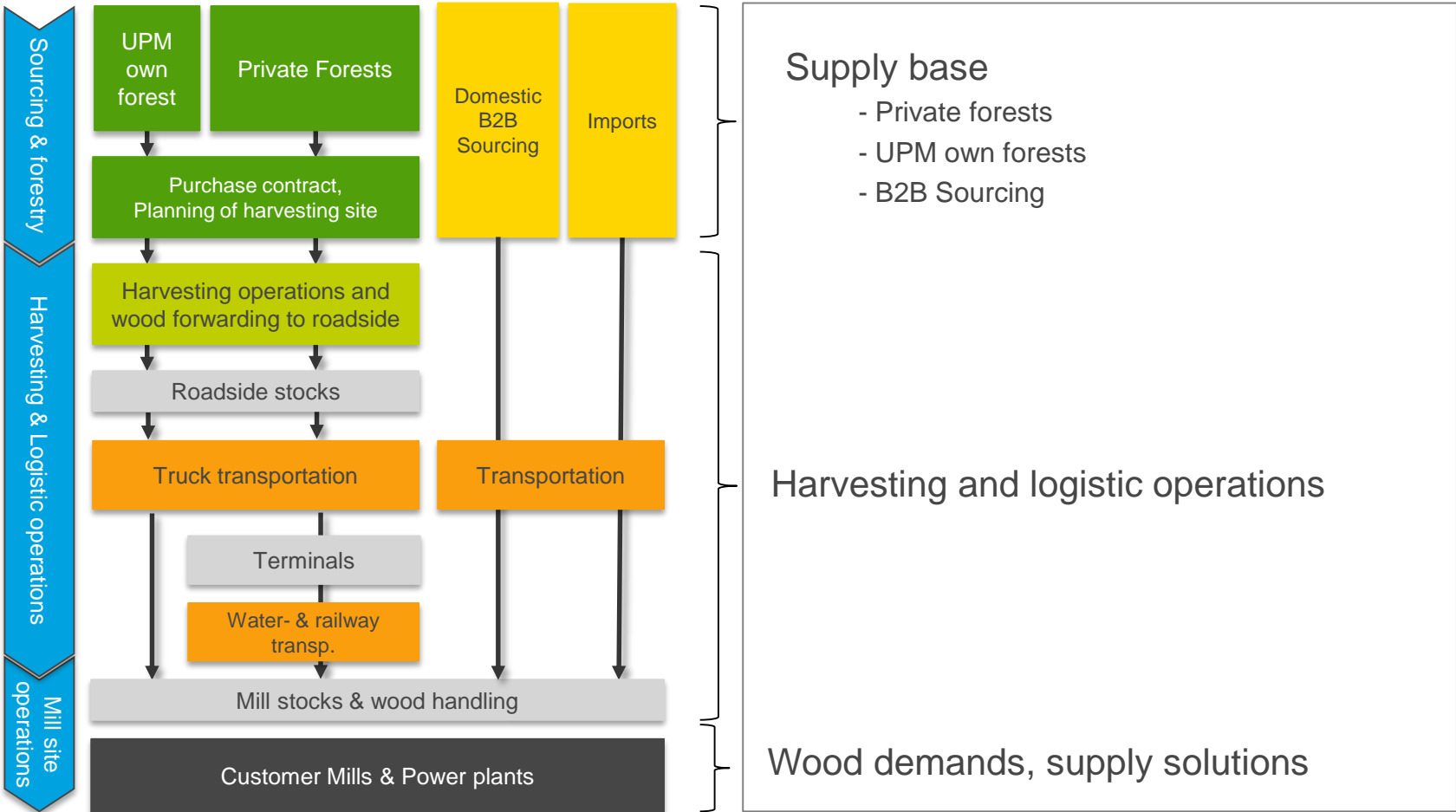
Harvesting
~ 65 entrepreneurs

Logistics
~ 70 entrepreneurs
- By trucks, trains and using waterways

Mills and bio power plants
- 18 plants in Finland
- Chudovo in Russia
- Otepää in Estonia

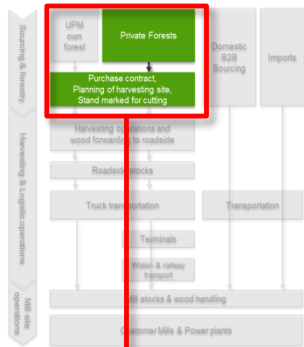
WOOD SOURCING AND FORESTRY, FINLAND

Walk Through of End-to-End Process in Wood Sourcing

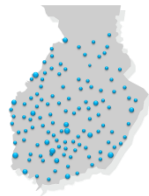


WOOD SOURCING AND FORESTRY, FINLAND

Supply from private forests



50% of annual demand sourced from the Finnish private forests. About 730,000 private forest owners in Finland. Average area owned is ~30 ha.



In Finland a network of ~**150** wood purchasers in 120 locations. ~**25,000** wood purchase contracts with private forest owners annually. Main sourcing method is **standing trade**.



UPM offers the possibility to join **UPM FSC®** and **PEFC™** certification groups to private forest owners.

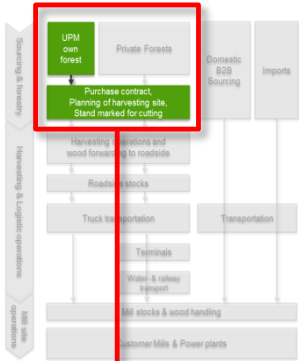


UPM wood purchasers **plans each harvesting area/site** separately for harvesting and transport purposes.

Harvesting right for each stand is 2+1 years on contract. On average, the rotation of standing reserve is **4 - 5 months**.

WOOD SOURCING AND FORESTRY, FINLAND

Supply from UPM's own forests



<10% of annual wood demand is supplied from UPM owned forests. UPM owns 700,000 hectares of forestry in Finland, which makes UPM 3.rd largest forest owner in Finland.



UPM owned forests are PEFC and or FSC certified. UPM owned FSC forest provide annually ~1.2 Mm of FSC certified raw-material to mills.

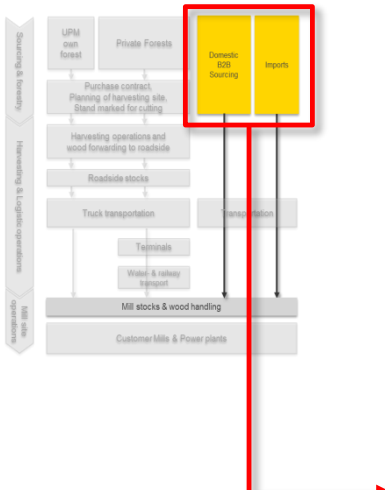


Vastuuntuntoisen metsänhoidon merkki



UPM's forest professional's forest management and certification expertise is based on the work in UPM forests. This expertise is offered to private forest owners: over million hectares of private forests are managed by UPM, part of them are FSC certified.

Domestic B-to-B sourcing and imports



~30% of wood is sourced from B-to-B partners.



3 types of B-to-B trades

- **Company swaps** – crucial in Finland
- **Net sale/net purchase** - sale of surplus material/buy needed
- **Saw log swaps** – UPM delivers logs to a sawmill and buys back pulpwood/byproducts



>10 % from imports from Russia & Baltics

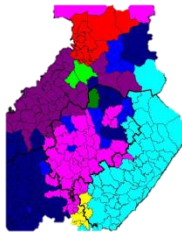
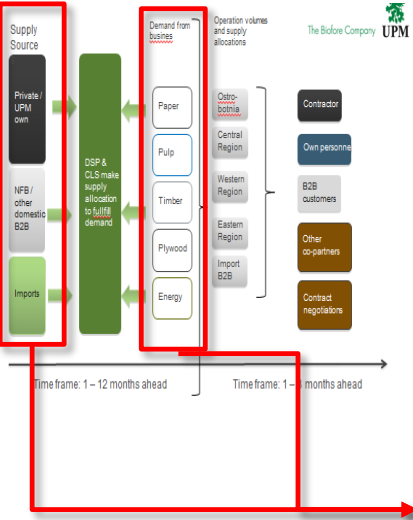
- Especially **birch logs & birch pulpwood & conifer chips**



Import is wood-assortment trade, mainly done in the terms of **FCA**. UPM provides wagons and other transportation capacity for suppliers use.

Wood Flow from Plans into Operations

Planning and operations

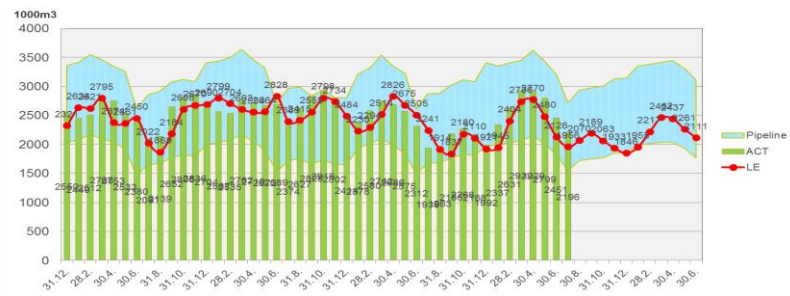


Business demands are met by constant flow of competitive and high quality raw-material.

Deliveries are optimized regularly. Optimization works as a base for operative planning and steering.

Storage pipes are a strong guideline to revise and implement operations.

Delivery and harvesting targets are revised continuously and managed by **contractors**.



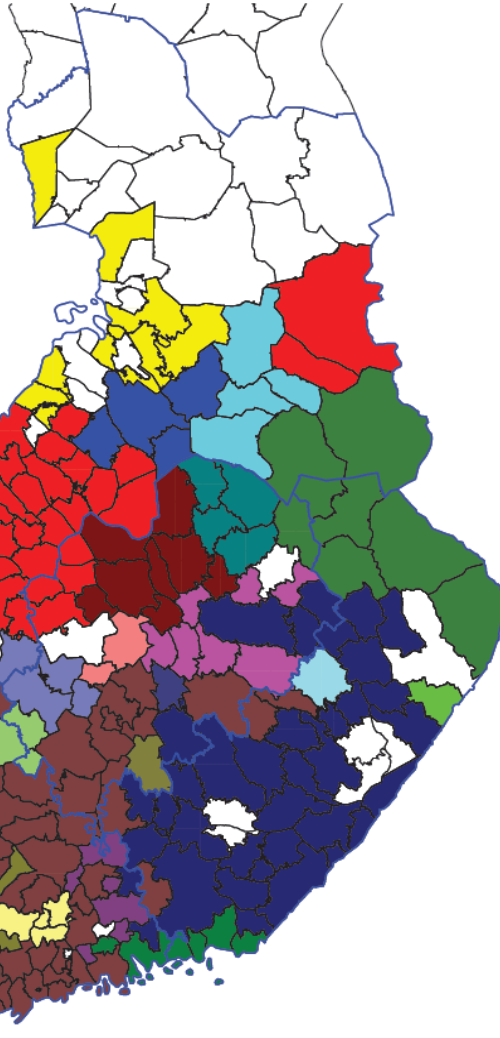
WOOD SOURCING AND FORESTRY, FINLAND

Logistics main numbers



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- Sahakuusittikki, kaikki kuljetusmuodot
- Alholman Saha
 - ET/Klee
 - Hasa/Haapavesi
 - Iisvöden Metsä, Suon enjoki
 - Junnikkala, Kalajoki
 - Kajaanin saha
 - Keiteleen Tsaha
 - Kotkan Hake/Kotka
 - Lappeenrannan saha
 - Luvian saha
 - ML/Renko
 - ML/Soinlahti
 - ML/Suolahti
 - MT/Vilppula
 - Multian Saha
 - Raunion Saha, Koski TI
 - Riihimäki Wood Oy
 - SE/Varkaus
 - Seikon saha
 - Vapo/Kevätriemi
 - Verso/ Hankasalmi
 - Viermäen Puu



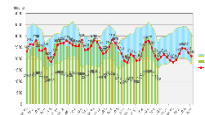
Supply of industrial wood to **>70** mills and energy wood to **>20** biomass boilers in Finland.



Average **harvesting site** is 3.4 hectares with average **volume** of 300 cbm.



75% of the volumes is delivered **by trucks**. Total delivery volumes of wood equals to **40 truckloads per hour 24/7/365**.



Daily 10-15 full railway loads delivered to UPM mills.

Storages scattered through Finland due to fragmented forest ownership and supply locations. Single wood storage size in roadside **40 cbm**, annually over **300 000 different roadside stocks**.



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WOOD SOURCING AND FORESTRY, FINLAND 2016-2020

National development



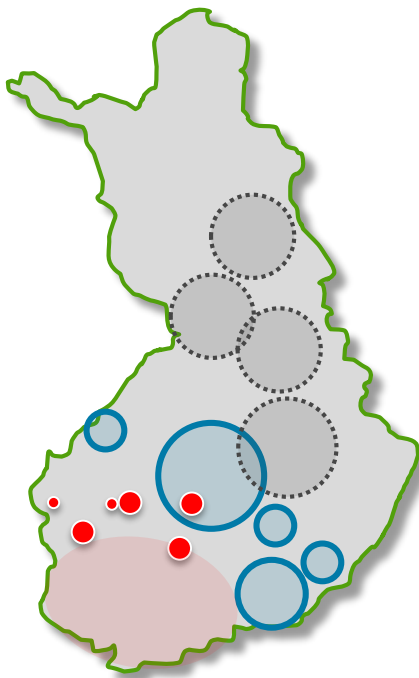
Energywood consumption increases in urban areas



Investments will increase wood consumption at existing mills



Possible new investments require new supply-chains



National, regional and local impact

- Finnish wood flows will change
- Change in log vs. pulpwood balance
- Regional and local differences will increase > impact to logistics
- Competition between forest vs. energy sector will tighten

Increase in pulpwood demand ->
Forest industry investments (5-7 Mcbm/a)
Use in energy generation (3-5 Mcbm/a)



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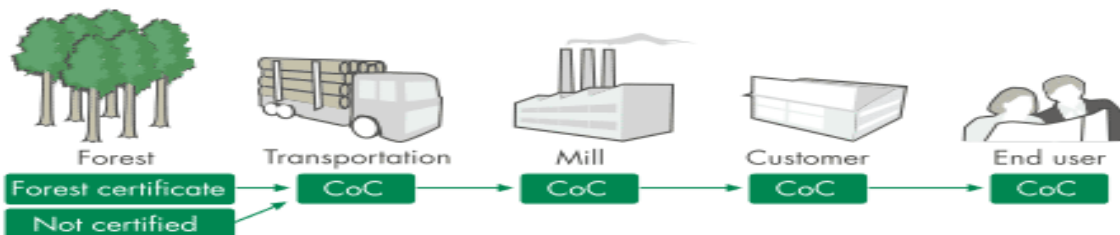
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WOOD SOURCING AND FORESTRY, NORTH EUROPE

Sustainability is in the **core of** our operations

- UPM operates according to the **principles of sustainable** forest management
- **We use certified wood to the highest possible degree** and promote a global increase in the use of certified wood
 - UPM promotes all credible forest certification standards: FSC, PEFC, UKWAS and SFI
- **We know the origin of wood**
 - Full control of the origin of wood and biomass supplied. Due diligence is managed through third party verified FSC/PEFC chain of custody



Sustainable forestry



Origin of wood



Legal logging



Environmental impact
And climate change



Biodiversity



Protected areas



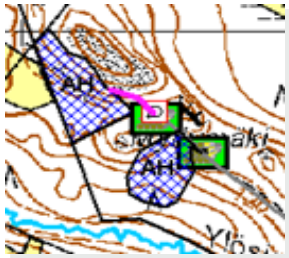
GMO



Customary rights and
religious values

WOOD SOURCING AND FORESTRY, NORTH EUROPE

UPM's origin of wood tracing system in Finland



Each harvesting site has a specified trade number

Harvesting according to the **trade number**

Stocks are identified by the trade number

Trade number follows **through-out the whole supply-chain**

Trade number and volume are identified in mill measurement and wood handling



UPM

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Company



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FINNISH FOREST OWNERS & PRIVATE TIMBER TRADE

Background

Finnish forest owner



- **+60 years old**
- Living in rural areas, close to her/his forest
- **Average size of forest 32 hectares**
- Owns forest him-/herself or with a companion
- Has inherited the forest
- Does forestry works him-/herself

Values forest as

- Place for recreation
- Possible backup for bigger investments
- Safe-heaven for retirement
- Kept within the family and for children

1) Contact for forest owners and start of the potential trade relation

2) Forest visit with UPM specialist & forest owner
- Decide potential harvesting volumes adjusted with forest owner hopes

3) Contract draft and agreement based on forest visit and expectancy
- Agreed actions, expected volumes, estimated prices & restrictions

4) Contract of sale/buy > UPM buys 2-years cutting right
- Prepayment paid to forest owner

5) Final settlement after harvesting and measurement



WOOD SOURCING AND FORESTRY, FINLAND

UPM contractors

A network of over 300 entrepreneurs

- 300 harvesters and 270 forwarders
- 220 timber trucks and 20 energywood trucks & mobile chippers, 30 special trucks for chip transports
- +2000 employees around Finland, mainly in countryside



62 harvesting companies

- 50 key contractors, 12 other types of contractors
- In average 4 harvester-forwarder combinations per contractor
- The average contract volume is around 200,000 m³/a, working mainly in **two shifts**

~70 transport companies

- 49 key contractors & 20 other types of contractors
- Average 5 truck fleet & 15 person/company
- The average contract volume is around 250,000 m³/a, working mainly in **two shifts**

~170 forestry work companies

- Personnel 0 - 5/company
- Work is very seasonal and usually companies specialized in certain types of work