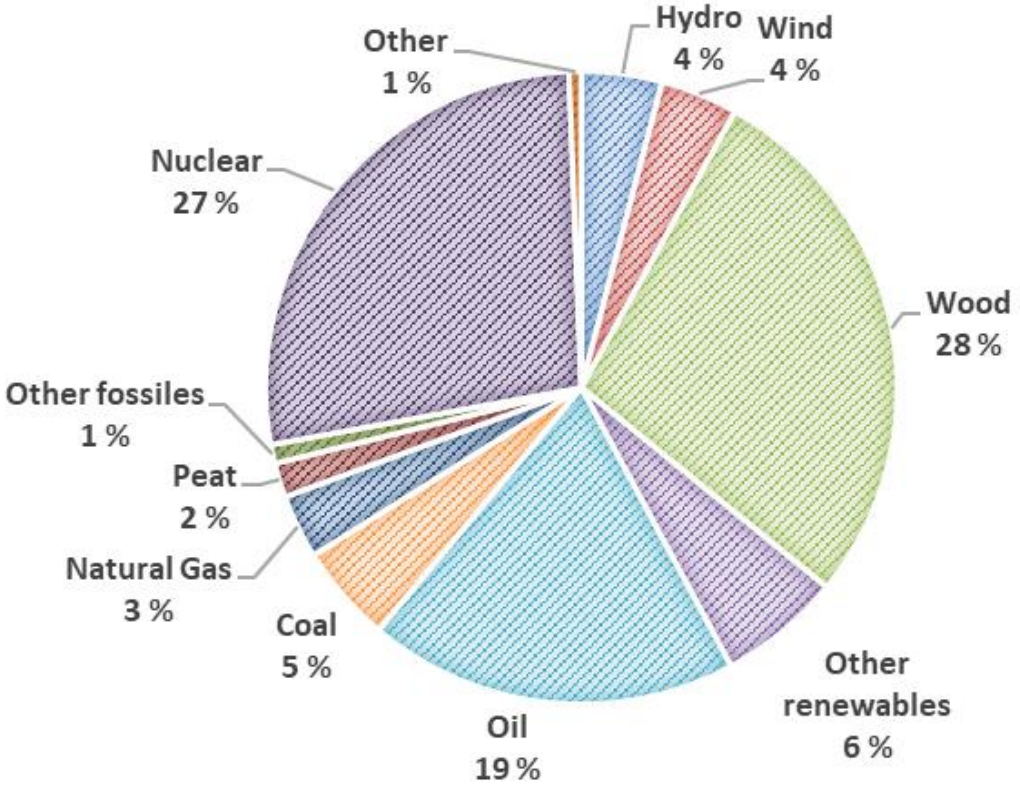
Luke
NATURAL RESOURCES
INSTITUTE FINLAND

Forest Energy in Finland

Lauri

- Principal Scientist, Group Manager
- PhD 1999
- 30 years of R&D in wood supply, bioenergy and internations know-how transfer.
- 5 years as a professor of energy pellet research (UEF)
- External Adjunct Professor of Lakehead University, ON
- Canada Manager of Luke (from ON to BC)
- Forest owner
- Angler

Greetings from Finland
Wood was the greatest source of energy in 2023



Statistics Finland 2024

Use of wood fuels in Finland

2023	Mm^3	TWh	Mtoe
Black liquer	21.3	39.4	3.49
Bark	5.9	10.9	0.97
Sawdust	2.7	5.0	0.44
Other residues	1.2	2.2	0.20
Recycled wood	1.1	2.0	0.18
Pellets	0.4	0.7	0.07
Forest chips	11.2	20.7	1.84
Chopped firewood	6.0	11.1	0.98
TOTAL	49.8	92.1	8.16

2024 / Luke

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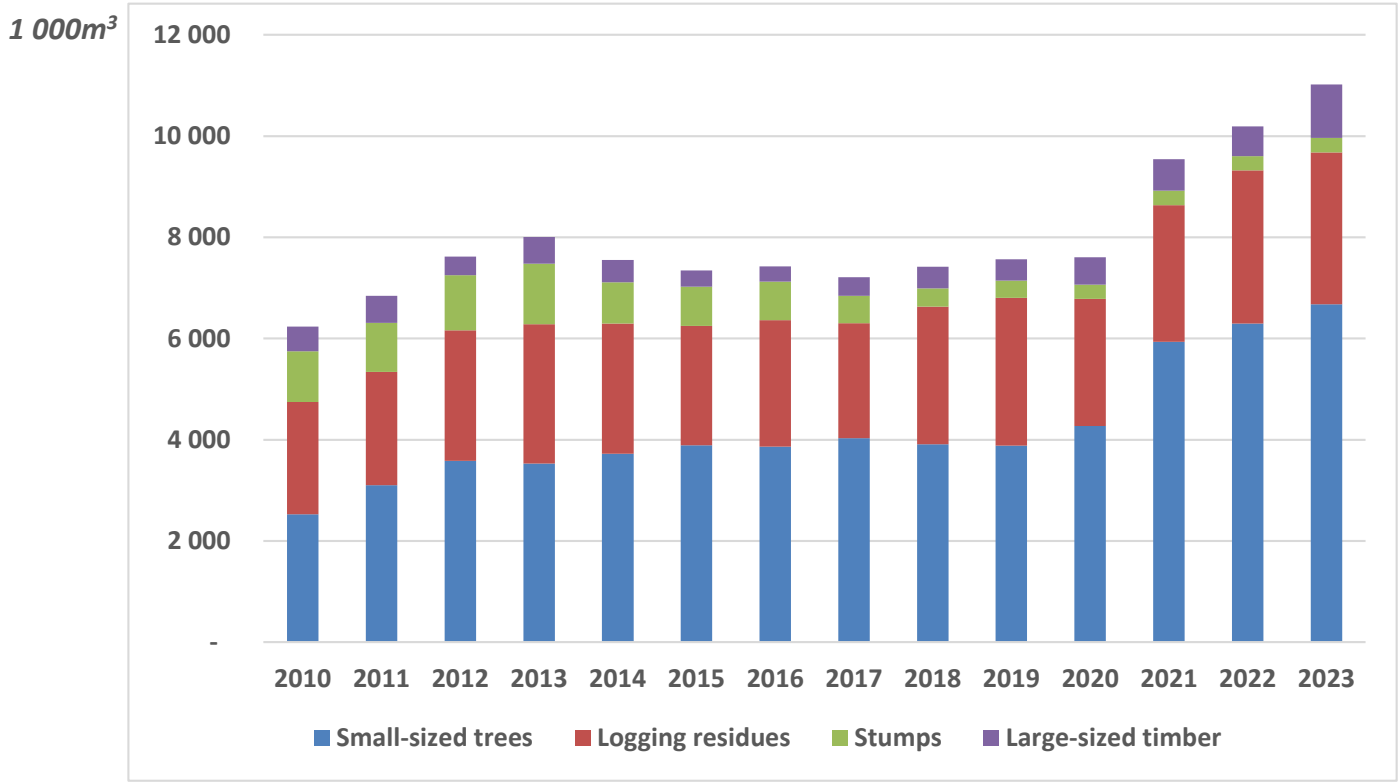
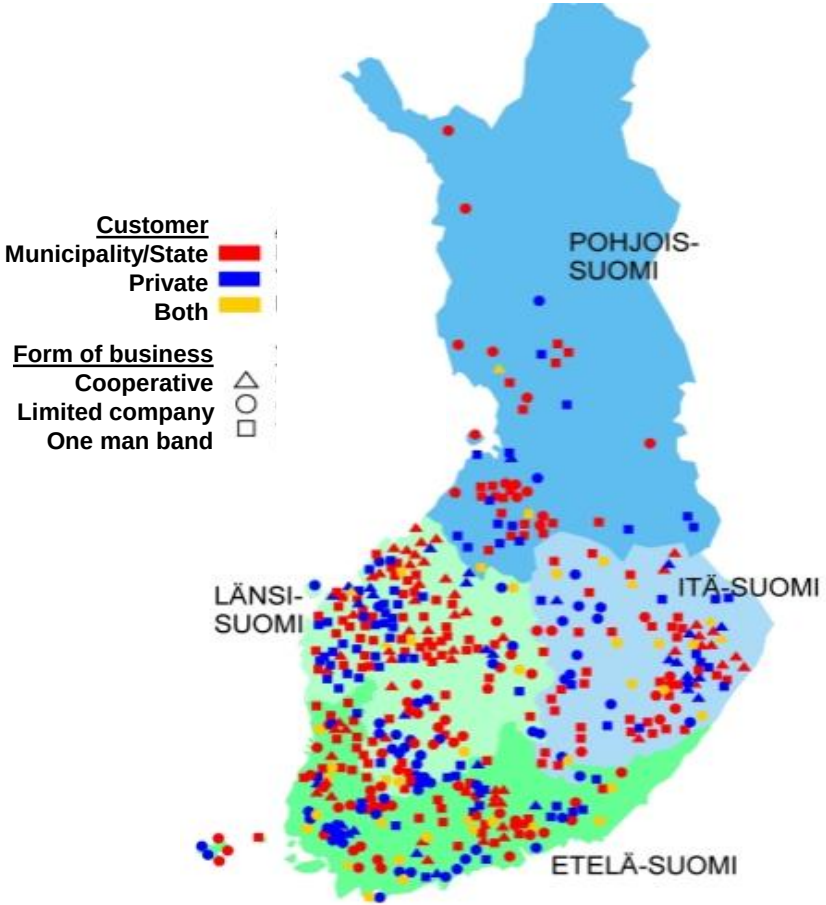
Raw materials of forest chips in Finland

(i.e. biomass harvested directly to be used for energy)



Heat entrepreneurship



Source: TTS Institute

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Large scale
50 - 500 MW

Medium scale
1 - 50 MW

Domestic
5 - 20 kW

Small scale
5 - 20 kW

Finland & Sweden

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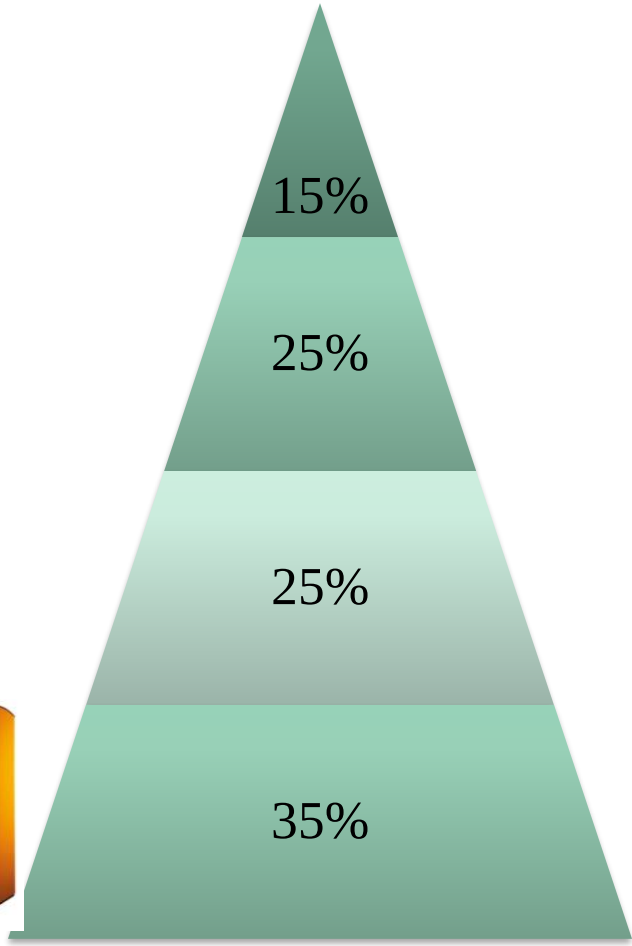
Central Europe

Large scale
50 - 500 MW

Medium scale
1 - 50 MW

Domestic scale
5 - 20 kW

Small scale
20 - 1000 kW



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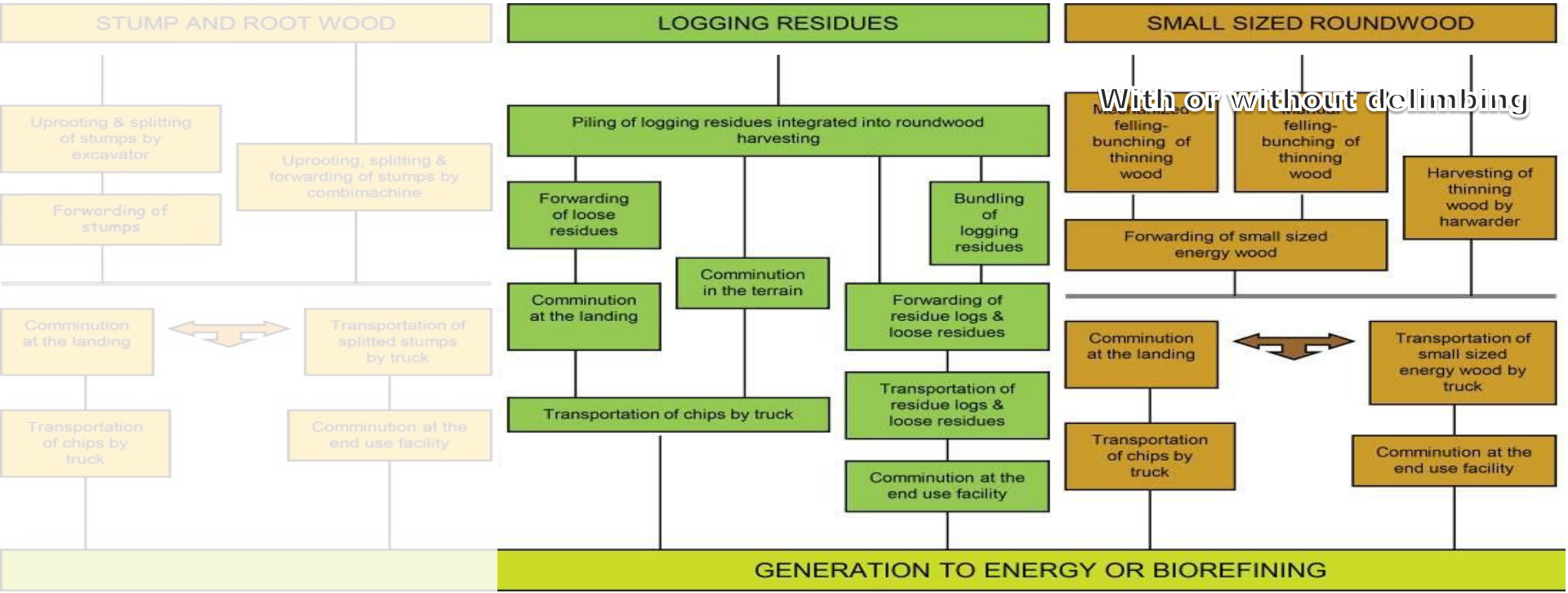
Forest Energy Supply Chains in Finland



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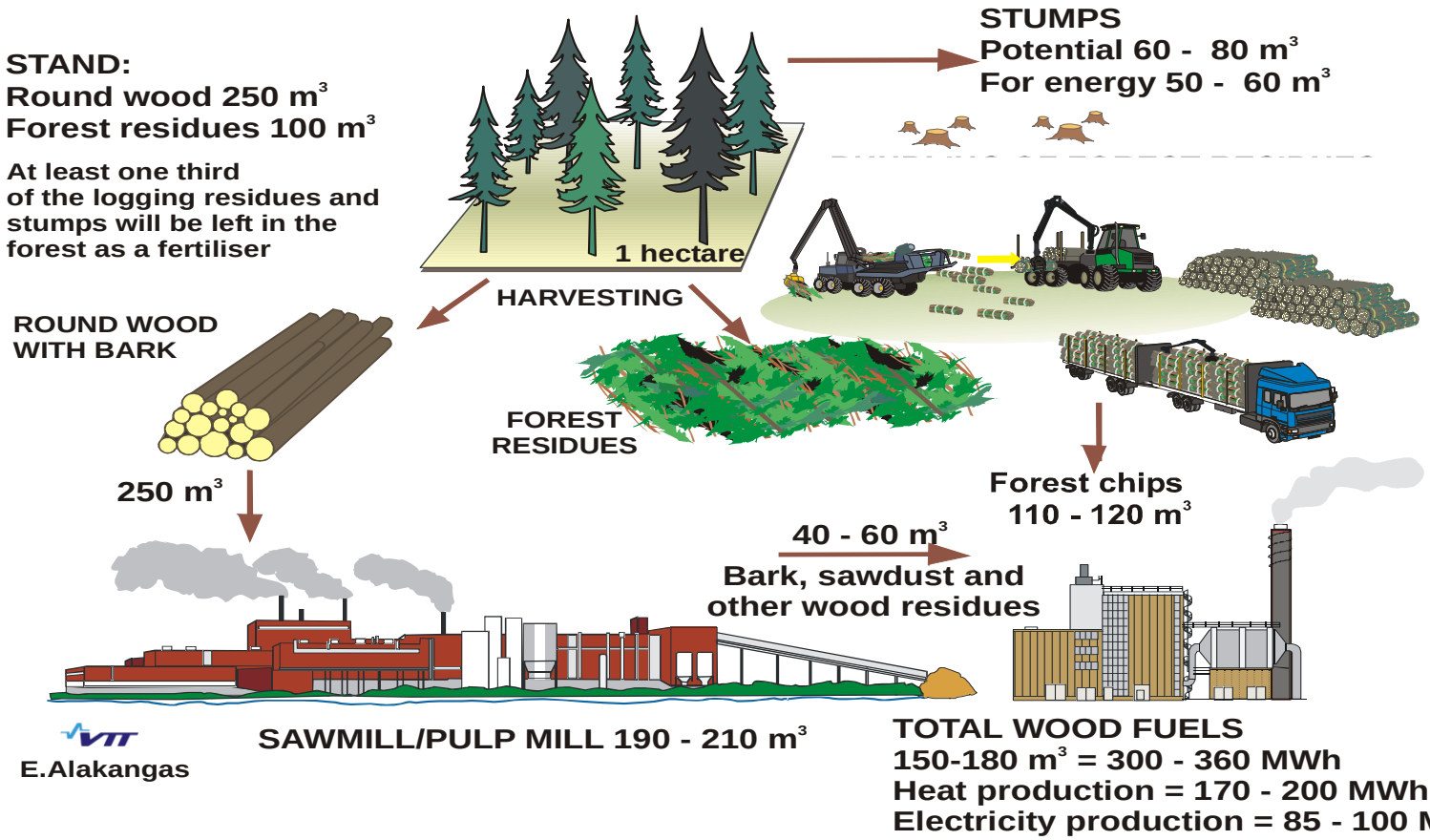
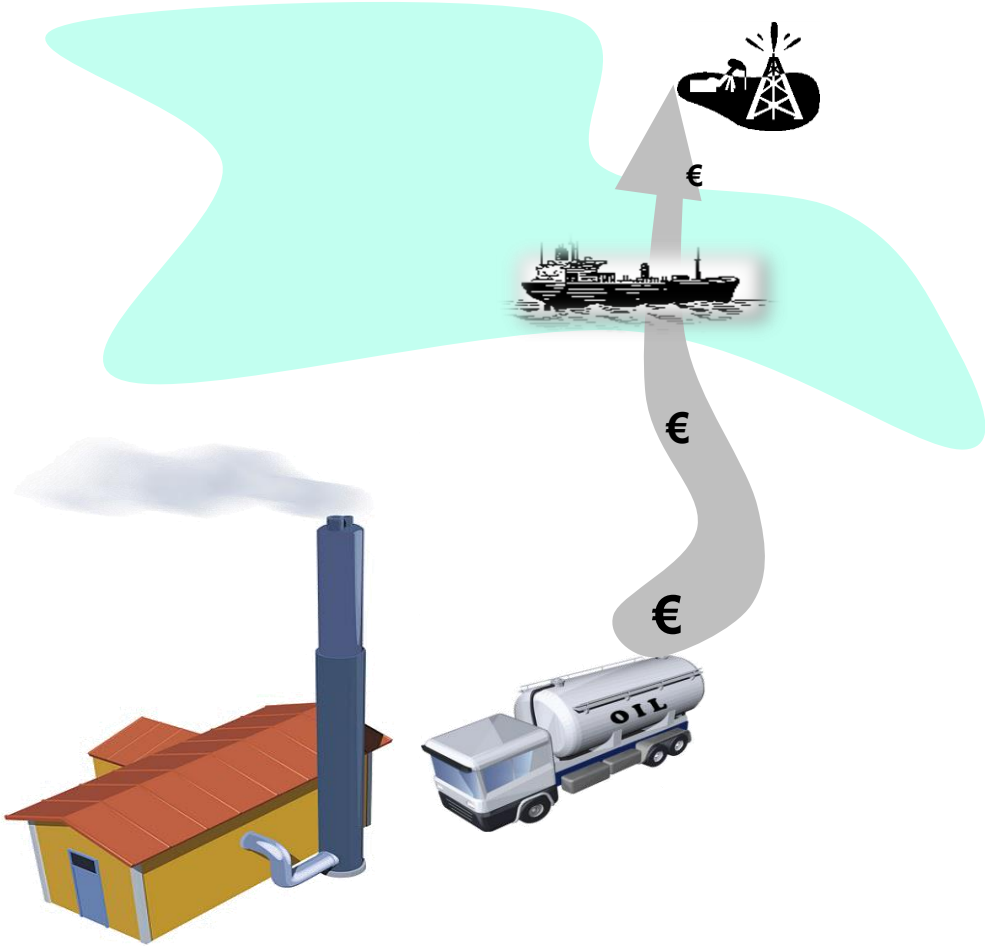
Integration of wood fuel production in the procurement of industrial wood




€
€
€
€


€
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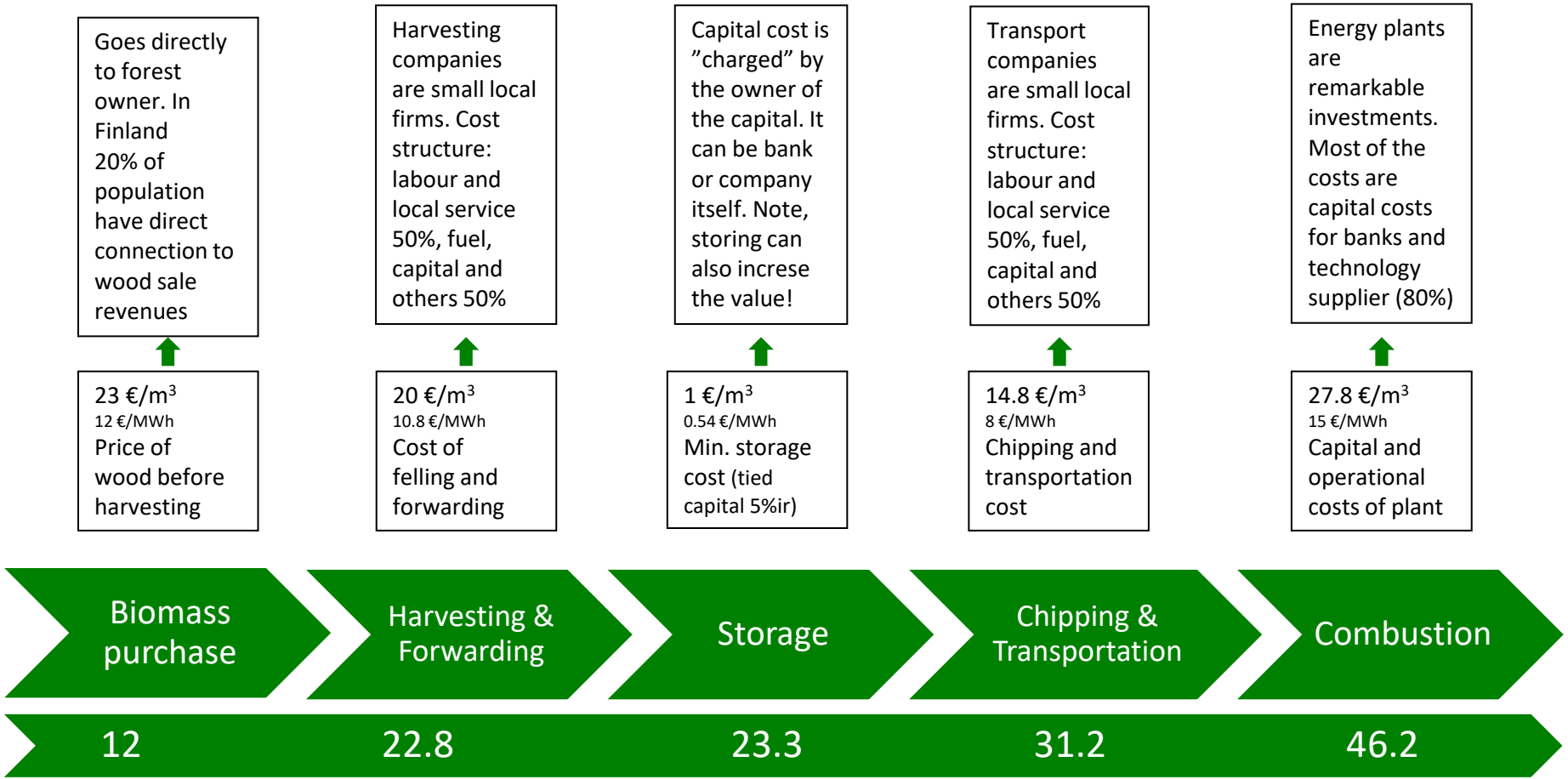
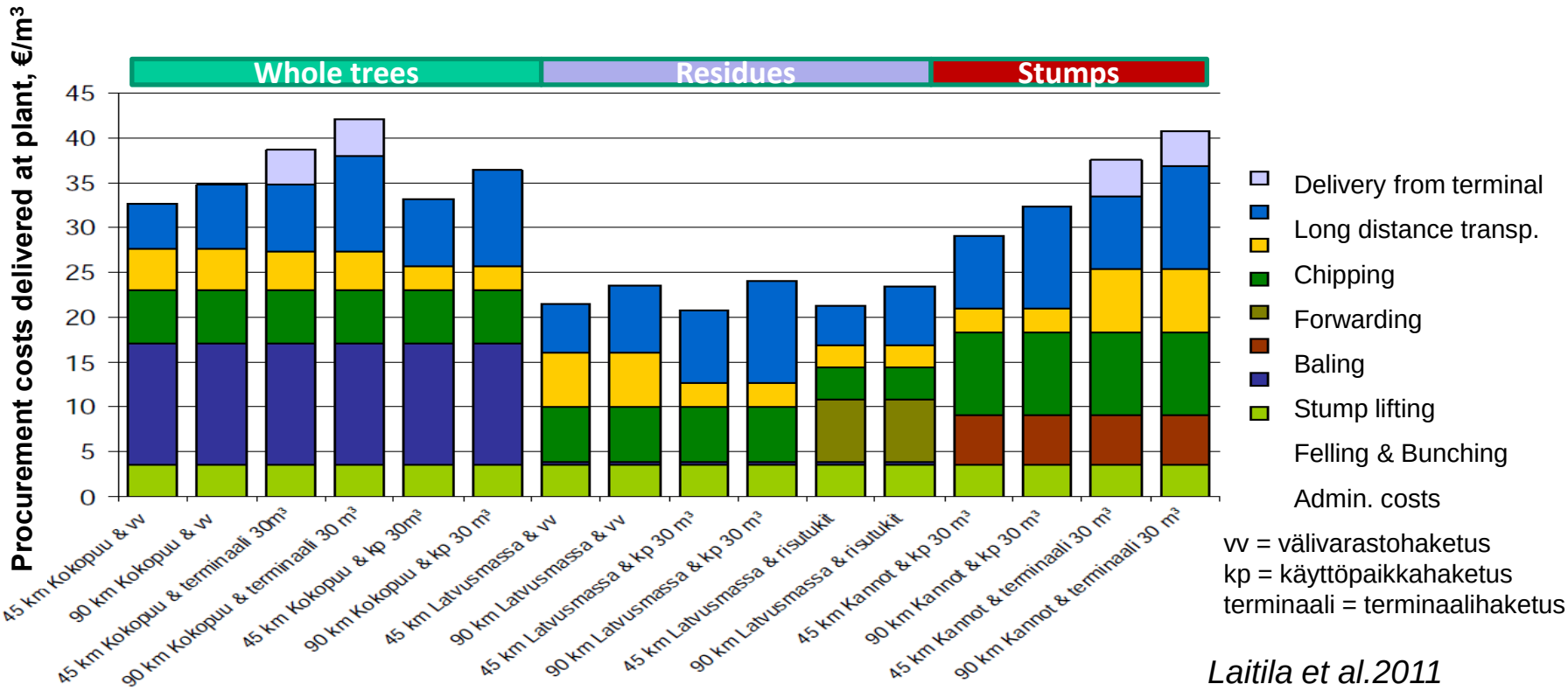
€
OIL

Value chain of one MWh



Cost structure and prices of wood fuels



vv = välivarastohaketus
kp = käyttöpaikkahaketus
terminaali = terminaalihaketus

Laitila et al.2011

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Sustainability - Carbon sink or source?

- Increased forest use usually decreases the carbon stock in the forest.
- Old forests have a lot of carbon in them but not sequestering new carbon effectively.
- If forestry is sustainable, forest biomass for energy will start to decrease carbon emissions within 20-30 years.
- Health, growing forest is always the best carbon sink and enabler of the use of renewable resources.

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Lessons learned so far

- Forest fuels can generate remarkable business and local welfare.
- Energy industry is now seriously in the business, this makes the field more interesting because forest industries is not any more the only major league player in forests.
- Electricity prices are unstable and that causes challenges especially for CHP-production.
- Holistic planning of value chains is crucial to ensure reliability.

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Future perspectives

- Logistics need to be developed when volumes get higher.
- Bigger plants will change the competition of wood resources in the future.
- Increased use of wood for traditional pulping and sawing increases also wood energy production.
- Biogenic CO_2 can be a raw material in the future when green H is converted to green methane and methanol.

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