

WoodHeat: Increasing value of the forest-wood biomass

HIA Kick-off

December 11th, 2019, Helsinki

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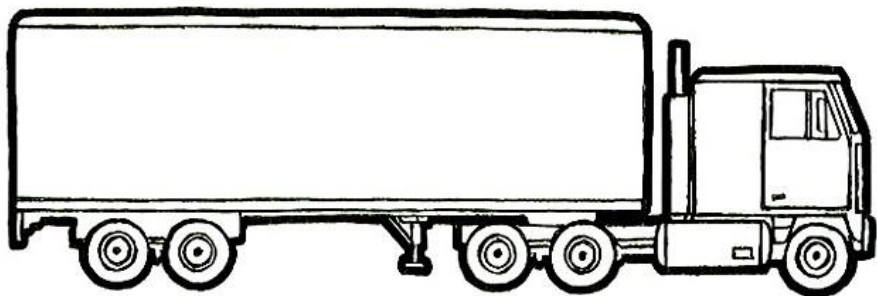
WoodHeat - Aim

- More efficient valorization of the wood-forest industry (wood chips and bark) materials
- Increasing materials calorific value and bringing direct benefits to wood-based power plants as end-users of the production chain
 - Price of the material based on the caloric value (€/MWh)



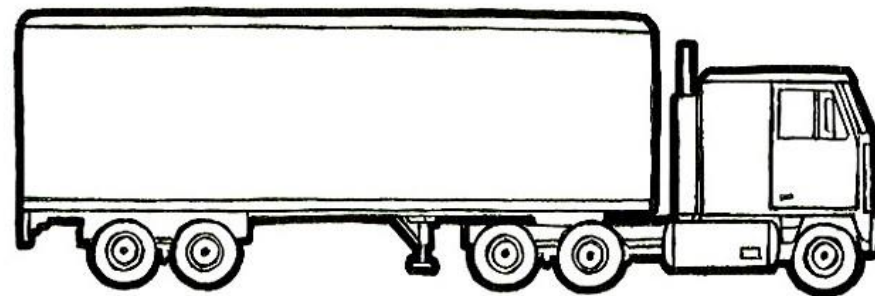
Moisture content vs. caloric value

Wet bark



Value 600 €/truck load

Dried bark



Value up to 2200 €/truck load

CAPEX and OPEX of drying?

Forest fuel supply chains

Traditional forest fuel supply chain

Fresh wood storage



Chipping of naturally drier wood



Naturally dried chips
 (35-40 %)

- ✓ Quality (10 - 12 GJ/ton)
- Capital investment costs



Energy wood

Fast forest fuel supply chain

Chipping of fresh wood



Artificial drying of fresh



Fresh chips
 (50-55 %)

- ✓ Capital investment costs
- Quality (6 - 8 GJ/ton)
- Storage (< 25 %H₂O)

Dried chips
 (10-30 %)
 - Small CHP
 - Biochar

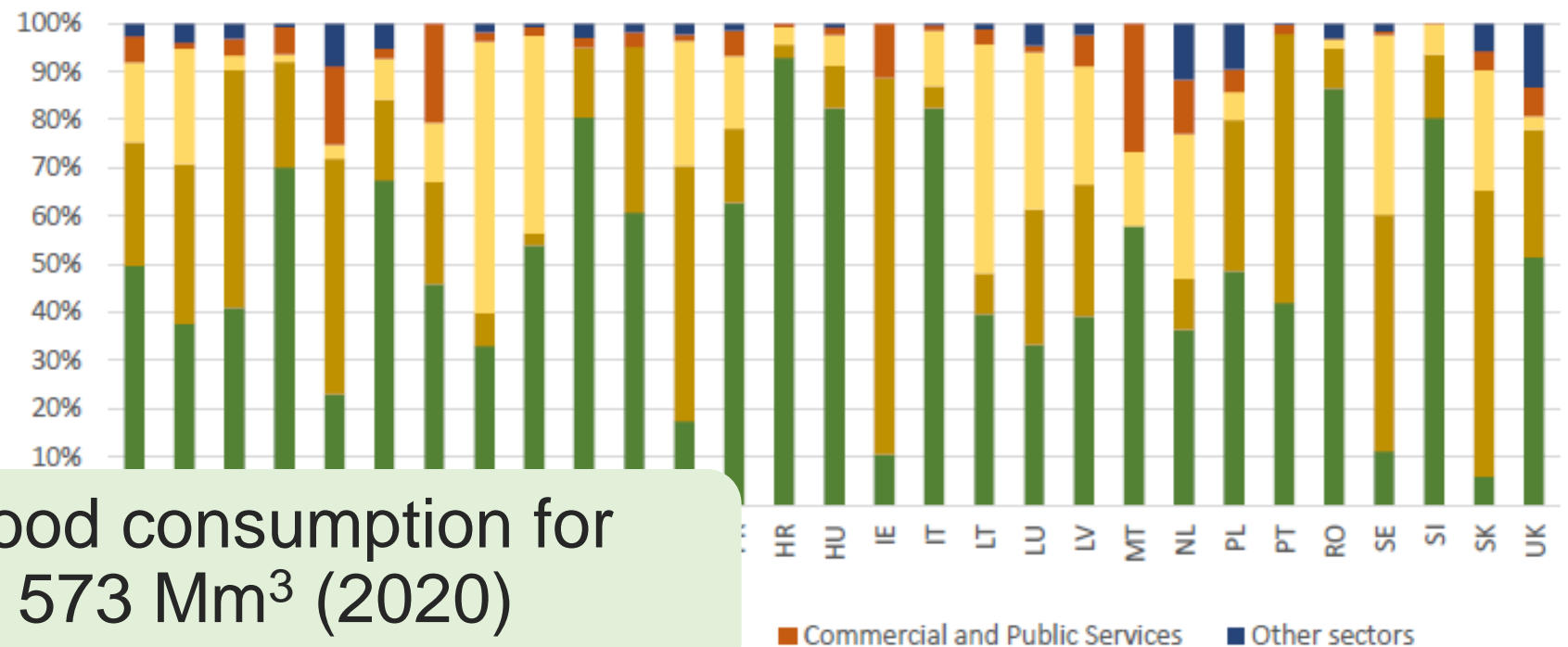
- ✓ Quality (up to 16 GJ/ton)
- ✓ Capital investment costs
- ✓ The dry matter loss
- ✓ Other valuable products

Bioheat in EU

The total EU's bioheat has increased by 70 % since 2000 to 2017

In EU countries wood consumption for energy production 573 Mm³ (2020)

Impact of the different sectors on the final energy consumption of Bioheat in the EU28 Member States in 2017 (%).

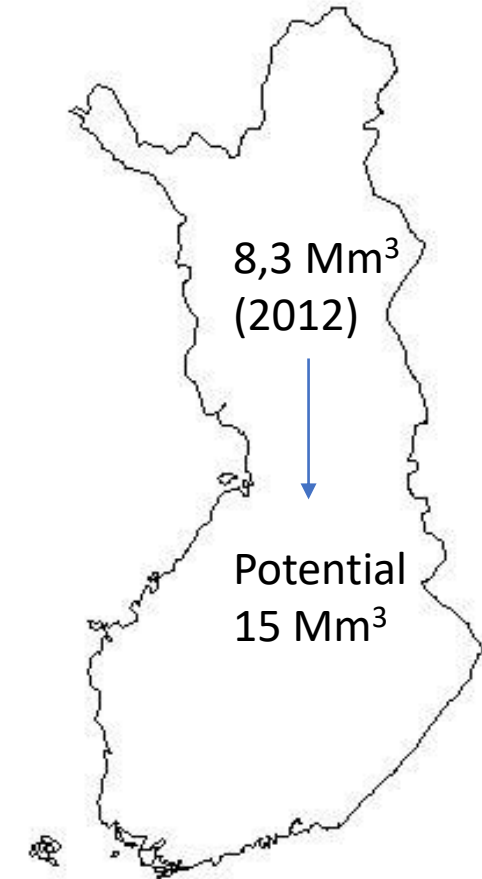


Source: Eurostat

Bioheat in Finland

- 94.4% of renewable heat is due to bioheat
- In Finland over 500 bioheat production units in operation by over 300 entrepreneurs
 - 1/3 of these plants are district heating plants
 - 2/3 are property-specific facilities

Forest wood chip use



Ref. J. Laurila, University of Helsinki (2013), ISSN 1795-7389;
Motiva (www.motiva.fi)

Consortium

Consortium	SFTec	Biomega	LAPIN AMK
Role	Drying technology (Lead partner)	Wood forest materials and wood-based power plant	Research
Region	Northern Ostrobothnia	Northern Ostrobothnia	Lapland
Location	Oulu	Martinniemi, Haukipudas	Rovaniemi
Website	www.sftec.fi	www.biomega.fi	www.lapinamk.fi



sfttec

DRYING NEW VALUE

www.sfttec.fi

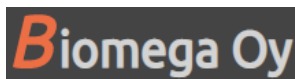
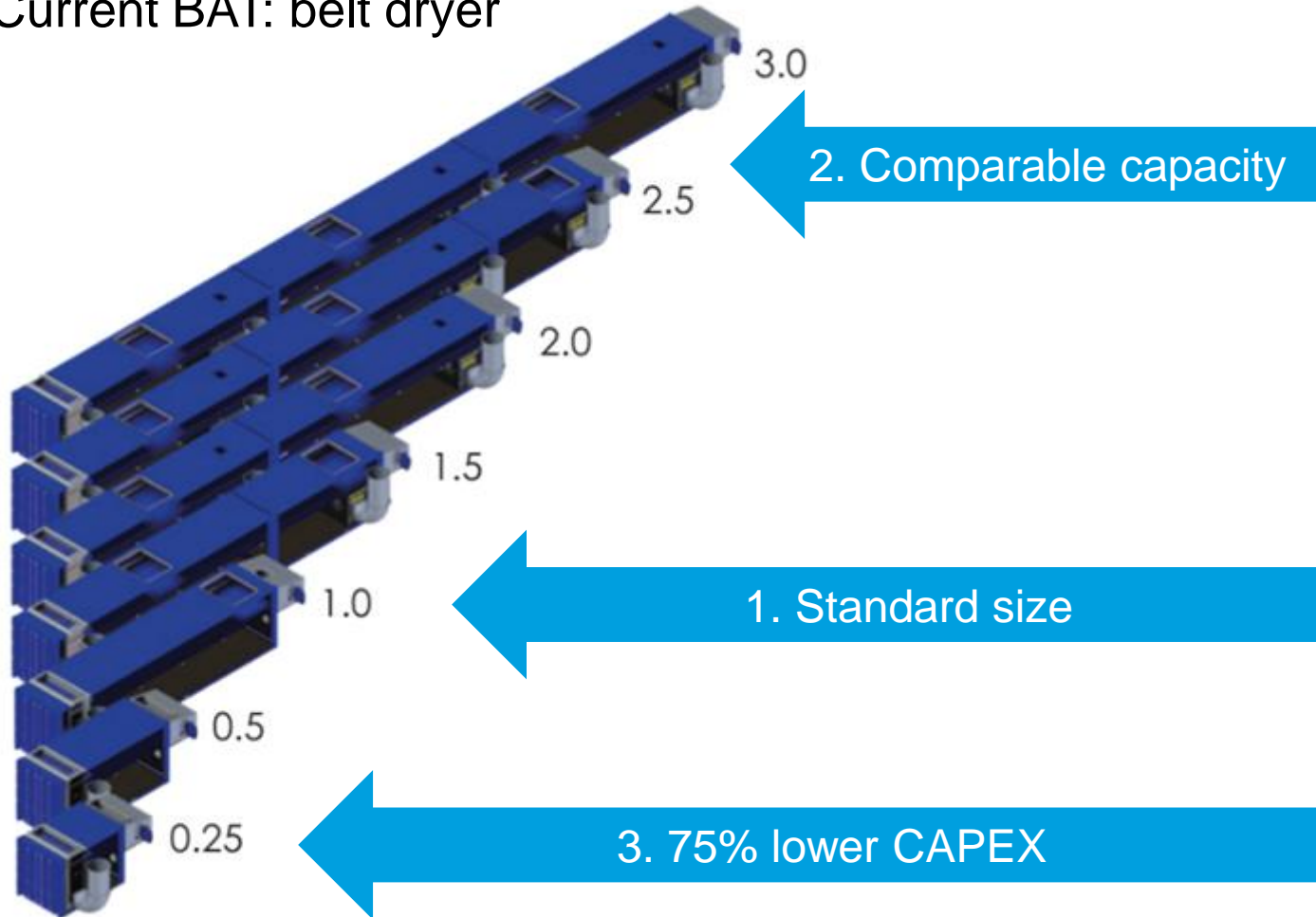
MODHEAT® – ENABLING TECHNOLOGY

- Profitable drying:
 - CAPEX: Modular structure, cheap to produce with standard parts, effective supply chain
 - OPEX: Utilizing waste heats in drying, minimized downtime, easy to maintain
- ModHeat® enables cost efficient drying for low value and hard to handle materials



WHY MODHEAT®?

Current BAT: belt dryer

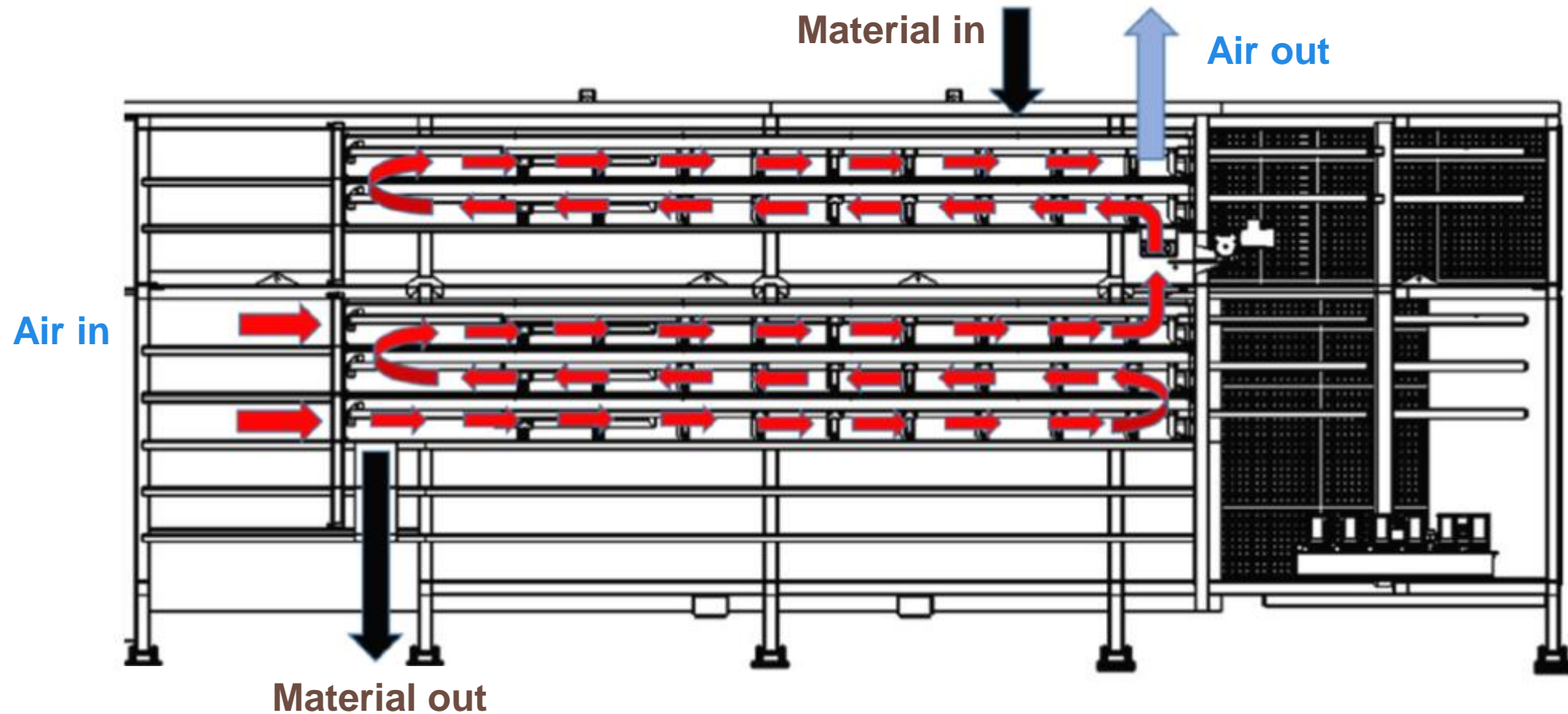


Efficiency for biomass

- Belt dryer **0,9-1,4** kWh/kg (H₂O)
- SFTec dryer **0,6-0,9** kWh/kg (H₂O) (LUKE 2019)



OPERATING PRINCIPLE



Lapland University of Applied Sciences

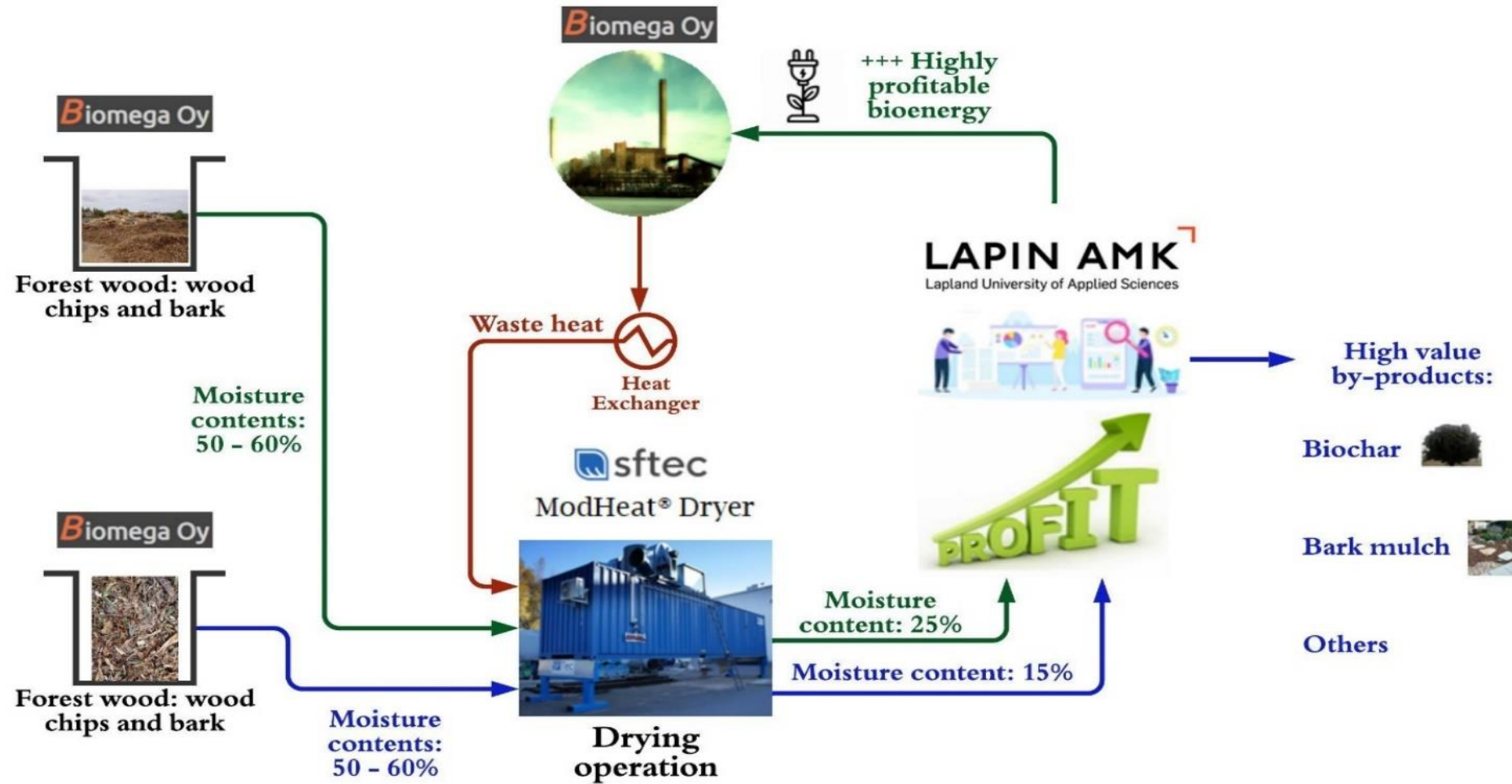
- The R&D partner
- Lapin AMK will provide the expertise in
 - The measurement's instrumentation for analyzing the piloting parameters
 - Full analysis of the economic feasibility of the overall WoodHeat process
- An independent evaluation of the results

Biomega Oy

- A project partner and enabler
- Provide the piloting facilities at Martinniemi, Haukipudas
- Provider of test materials and the waste heat



The WoodHeat pilot



WoodHeat project - Targets

- Build up of piloting facilities
 - Test waste heat utilisation
- Piloting of artificial drying – ModHeat® technology
 - Energy efficiency (kWh/kg_{H2O})
 - Capacity (m³/h)
 - OPEX
- Technical and economic feasibility analysis of drying

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