

Heat entrepreneurship in Finland

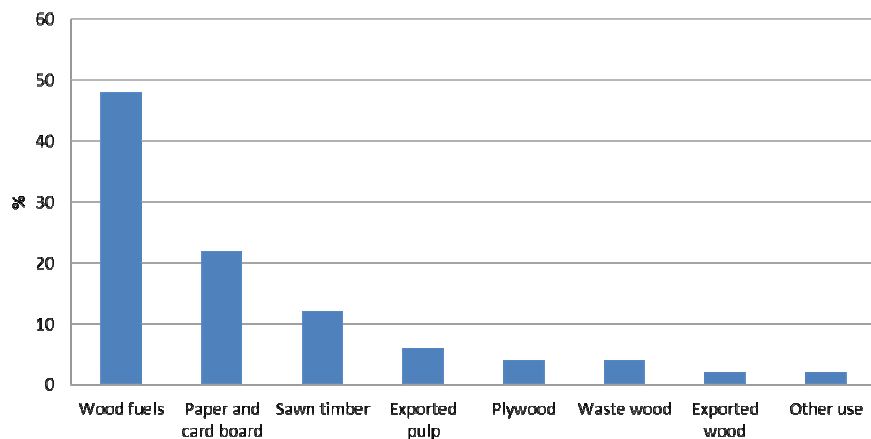
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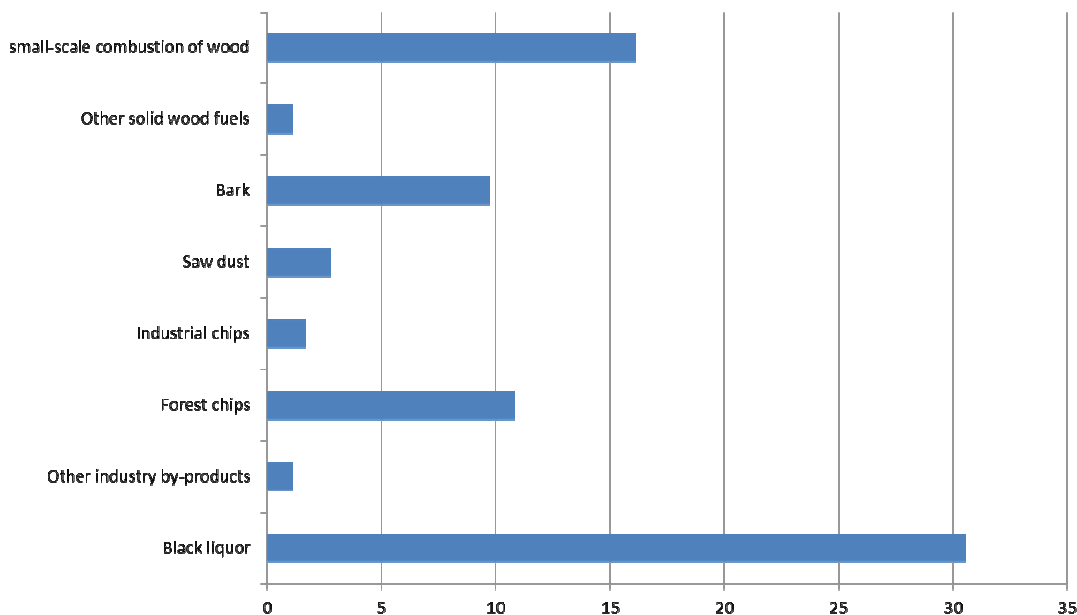
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Wood consumption in Finland

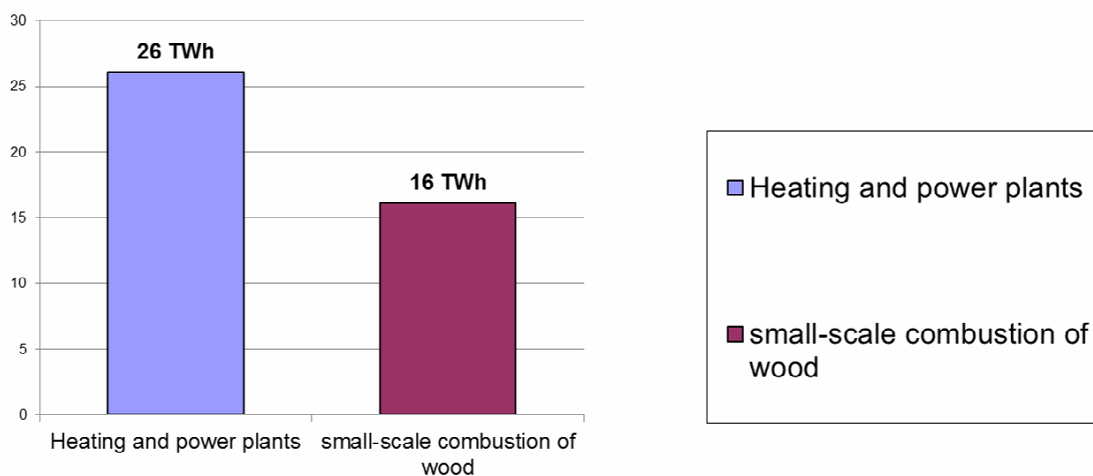
- 26 million ha forest, 100 million m³ growth
 - Use of round wood in Finland 2009 was 59,5 million m³ (solid)
 - Directly for energy 8 million m³ (solid), but
- Use of wood in Finland**



Wood fuels in Finland 2009, 74 TWh/266 PJ, In Finland 75 - 80 % from renewable energy is wood energy

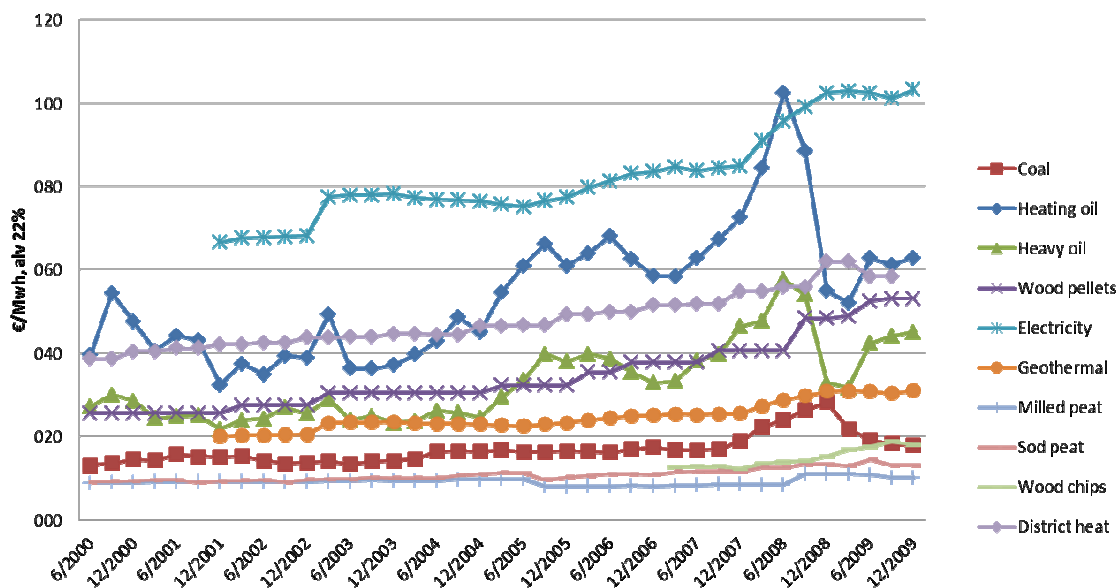


Solid wood fuels in Finland 2009



Fuel prices in Finland

Developing of the prices of the fuels 2000 -2009



Business model

“Business model describes the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital in order to generate profitable and sustainable revenue streams”

(BMO Ontology, Osterwalder 2004)

- Business architecture
- Earning logics

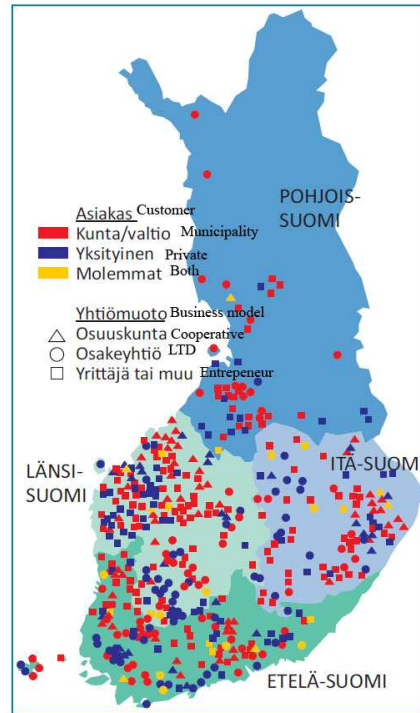
Business model

- Business architecture for product/service flows, including:
 - Establishing the heating plant and district heating network
 - Organising the wood fuel supply chains
 - Defining ownership and responsibilities between all stakeholders involved (sellers/buyers of the service, subcontractors and fuel producers)
- Establishing the earning logics, i.e. strategies to generate and maintain profitable and sustainable business operations.

Case Finland

- Heat entrepreneur/enterprise:
 - (a) Single entrepreneur
 - (b) Entrepreneur consortium
 - (c) Company
 - (d) Cooperative
- Development in Finland started in early 1990's
- In 2009 ~455 heating plants used by local entrepreneurs (250 MW)
- Average size was 550 kW
 - 244 heat plants operated by ltd or cooperatives
 - 203 private heat entrepreneur
 - District heating plants 134 (133,6 MW; 1,00 MW average)
 - Heat plants for real estates 321 (116,5MW; 0,36 MW average)

Heat plants operated by entrepreneurs



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Biomass

- Fuels:
 - Forest chips
 - Pellets
 - Briquettes
 - Peat
- 1 000 000 bulk cubic (loose m³) meters of forest chips
 - 690 000 MWh of heat
 - Demand of 28 000 medium-sized private houses
 - That was 7,2 % from forest woodships used for energy
- 80 000 loose m³ other woodfuels
- 40 000 loose m³ peat

About investments

- Investment by customer (municipality /industry)
 - Entrepreneur/own employee takes care of the practical operation and maintenance work
 - Customers are bearing the investment risk
 - In early stage technological and financial risks were bigger
- Investments by entrepreneurs
 - Risks have decreased
- Willingness to invest in bigger biomass DH schemes has increased → economics of scale

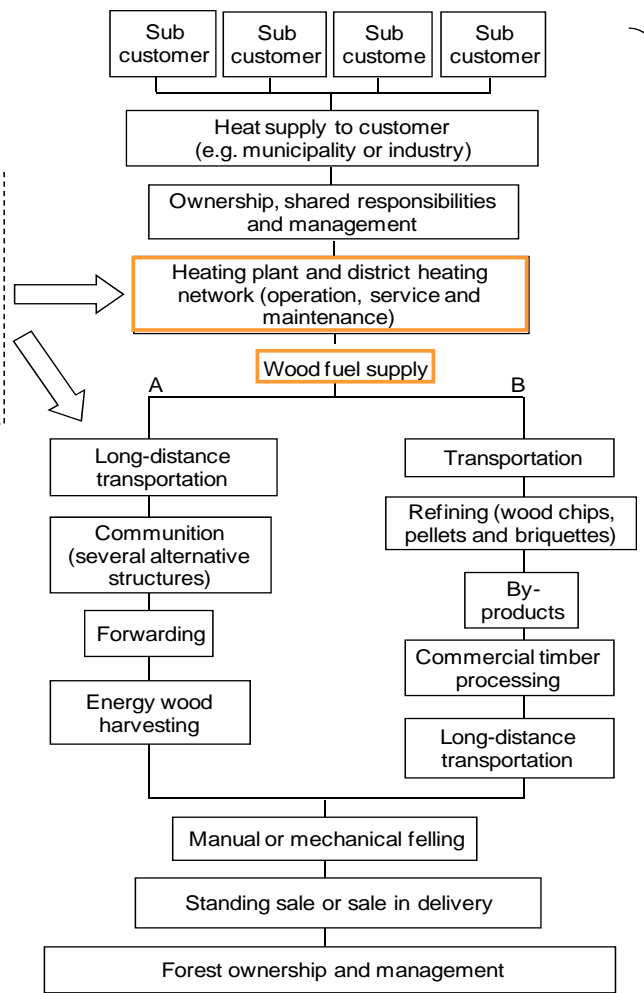
Ownerships

- Customer (e.g. municipality) owns the heating plant and network
 - Decision-making and control over the heating service
 - Intermediate (public utility or company) can be used to prevent risk realisation
- Entrepreneur owns and controls the heating
 - Customer pays only for energy consumed and has no risk in investments
 - Entrepreneur bears the risk, but might be more profitable
- Customer receives ownership with delay
 - External investor (e.g. servicing company or third party financier)
 - Ownership transfers after investor has received the invested money back
- External network or concept provider has the ownership
- Entrepreneur will produce the heat according to contract

Business Architecture

Financing and investing

- Own finance
- Grants
- ESCo
- Franchisee
- Large company network
- Customer



EARNING LOGICS:

- Second/third party financing
- Safeguarding the markets
- Value added by holistic value chain management
- Complementary partnerships
- Networking and subcontracting



Business models in practice

1. Public utility or company
2. Public-private partnership
3. Private company /cooperative
4. Network model of a large company
5. Energy saving company (ESCO)
6. Franchising

| Case | Business model | Investment | Ownership | Fuel supply | Operation | Earning logic |
|-----------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Nurmes | Public company | City of Nurmes | Public company (municipality 88% and PKS energy company 12%) | Sawmill by-products (Vapo Ltd.) Peat (Vapo Ltd.) Wood chips (various suppliers) | Public company | Safeguarding the markets Networking (scale economies) Customer ownerships Subcontracting Value added by by-product management |
| Pyhäselkä | Public-private partnership | Municipality of Pyhäselkä (2010 VAPO) | Vapo Ltd. (pellets) Private entrepreneurs (wood chips) | Vapo Ltd. (pellets) Private entrepreneurs (wood chips) | Municipality (2010 VAPO) (pellet boilers) Entrepreneur (2010 VAPO) (wood chips plant) | Safeguarding the markets Subcontracting |
| Eno | Private cooperative | Municipality of Eno (2011 Eno Energy)(1 st plant) and Eno Energy Cooperative (2 nd and 3 rd plants) | Municipality of Eno (2011 Eno Energy)(1 st plant) and Eno Energy Cooperative (2 nd and 3 rd plants) | Cooperative members and open markets Communitation is subcontracted | Cooperative | Safeguarding the markets Value added Complementary partnerships Subcontracting |
| Ilomantsi | Network model of large enterprise | Municipality (old plant), large company (biofuel integrate) | Vapo Ltd. owns the industrial plant and rents the old municipal plant and network | Vapo Ltd., peat and wood chips | Vapo Ltd. | Networking Economics of scale Safeguarding the markets Subcontracting Value added by by-product management |
| Enespa Oy | ESCO | ESCO | ESCO and customer after the pay-back | Market pellets | Technical operator in energy renovation; | Third party financing Subcontracting in |



Thank You for Your attention

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