Examples of Woodfuel Supply Clusters in Finland

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October 2010
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1 Preface

This publication is a part of the AFO-project (Activating Private Forest Owners to Increase forest Fuel Supply -IEE/08/435/SI2.529239, www.afo.eu.com) funded by the European Union’s Intelligent Energy Programme.

The AFO-project is coordinated by VTT, Technical Research Centre of Finland. The other partners are Forestry Development Centre Tapio (Finland), Technical Center of Forest, Wood Products and Furniture (France), Institute for Forestry Development IDF-CNPPF (France), Forestry Commission (UK), South Yorkshire Forest Partnership (UK), Energy Restructuring Agency (Slovenia), BIOENERGY 2020+ GmbH (Austria) and Environmental Projects State Ltd (Latvia).

The AFO's main objective is to increase woodfuel supply from privately owned European forests. In terms of EU-level biomass production, private forest owners (PFO's) form an active forest owner group, as they possess most of the European woodfuel potential. The AFO carries out various activation procedures to initiate woodfuel supply clusters among PFO's. These clusters are brought together with the potential wood energy users, focusing on local small and medium scale heat plants.

The project operates from 2009-12 in six countries and five specific target areas. Finland and Austria is countries of high woodfuel utilization and long experience of bioenergy harvesting and procurement systems. Best practices are transferred from these countries to less experienced partner countries with large areas of woodland in private ownership (France, Slovenia, Latvia and UK). Results and best practices acquired in the project will be disseminated throughout all EU member countries.

This report describes three different management structures for woodfuel supply of small or medium sized heating facilities in Finland. These examples were selected on the basis of functionality, effectiveness and proven processes. The examples show that there are various existing procurement arrangements that operate well in Finnish circumstances. Reading this report, consider the strengths and weaknesses of these procurement systems in relation to the specific conditions in every country.

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Helsinki, October 2010
2 Finnish Forests and Woodfuel Use

2.1 Facts from Finnish Forests

There are over 440,000 forest holdings in Finland. An average forest holding possesses 24 hectares of forestry land. Forestry land covers 86 percent of the total land area in Finland, making it the most forested country in Europe. Private forest owners possess over 70 percent of the growing stock and 52 percent of the forestry land, state owning only 35 percent of the forestry land. State forests are situated mainly in the Northern Finland, where forests are primarily protected for biodiversity conservation. Measured by the volume, Scots Pine covers 50 percent and Norway Spruce 30 percent of the total growing stock, broadleaves (mainly birch) representing only 20 percent of the total volume.

The annual growth is about 100 million m$^3$ in total. In 2008 the total drain was 70 million m$^3$. Total commercial roundwood removal in 2008 was 51.7 million m$^3$ as the removal of pulpwood rose to a new record of 30.1 million m$^3$.

Figures 1 and 2. Volume of the growing stock (m$^3$/ha) and the location of the three wood fuel supply clusters introduced in this report. Source: Finnish Forest Research Institute Metla.
2.2 Woodfuel Use in Finland

Finland has strongly increased bioenergy production and forest-based energy has had an essential role in this process. In 2008 wood-based fuels covered one fifth of the total energy consumption, being the second most important energy source after oil products. In the future, 55 percent of the bioenergy increment is intended to be covered by wood by 2020. Forest industry’s by-products and wastes, such as bark and black liquor, are by far the most important sources as they comprise over 80 percent of the total wood energy production.

Forest chips, i.e. wood chips procured directly from forests for energy production, play a significant role in bioenergy enhancement, as they are estimated to cover 8 percent of the total energy supply by year 2020. This is more than twice the amount of chips combusted at the moment. In 2009, altogether 6 million solid-m\(^3\) of forest chips was used. In addition, approximately 5 million solid-m\(^3\) of fuel wood (log wood) was used in small-sized dwellings.

Nearly 60 percent of the wood chips originate from logging residues accumulated from regeneration felling sites. Small-diameter stems harvested from young stands are the second most important source of wood fuel with the proportion of 23 %. Majority, 85 percent, of these young stands are harvested as whole trees i.e. also branches and tops are retrieved for combustion. However, delimbed stem harvesting is spreading rapidly due to environmental reasons, better fuel quality and development of multi-tree handling techniques. Stumps and coarse stem wood combustion possess the rest (19 percent) of the total forest chip stream.

In remote areas woodfuel entrepreneurs bring valuable income to the local economy. There are over 450 heating plants managed by private entrepreneurs. Most of them take care of heating communal properties. In 2009 heat entrepreneurs used altogether 980,000 loose-m\(^3\) of wood chips. Heating plants are most densely situated in Western Finland, when in Northern Finland there’s only few heating plants managed by private entrepreneurs.

![Figure 3. The total use of wood chips derived directly from small diameter stems, logging residues and stumps in Finland 2000-09, millions of solid cubic meters. The dark green columns describe the amounts of chips combusted in heating and power plants, whereas the lighter green bars illustrate the chips used for heating singular detached houses. Source: Finnish Forest Research Institute Metla.](image-url)
3 Eno Energy Cooperative

3.1 The District

Eno, population of 6,500, located in Eastern Finland, approximately 35 km northeast of centre of the city of Joensuu. 94,000 ha with 15,000 ha of lakes, rivers and other water bodies. There are altogether 1,300 forest holdings in the Eno district. The average size of a forest holding is 55 hectares.

![Figure 4. There are 72,000 ha of woodlands in Eno, of which majority is owned by private forest owners. Photo by Urpo Hassinen.](image)

3.1.1 The Status of Woodfuel in the Region

In Eno both the municipal properties and the largest private estates are heated with district heating plants fired with wood. Oil and electricity are still commonly used in the heating. This is partially due to the fact that settlement houses are situated in isolation; complicate the attachment to the district heating networks. However, in farm facilities situated on the rural areas, woodfuel represents the most common source of energy.

Since the turn of the century, there has been a great change in the district’s use of energy sources. Over 1.6 million litres of oil has been replaced by burning 24,000 loose-m^3^ of wood chips instead. Doing this, over €1,000,000 have been saved for the local economy.

Evidence shows capital investment stays within the municipality and total employment effect of increasing woodfuel deployment is 7-10 man-years. Local energy sourcing aids fuel security. Wood absorbs the same amount of CO\(_2\) as is released on burning, thus combustion of wood does not result in a net increase of CO\(_2\) emissions.

The ash of the heating plants provides an excellent benefit to the forest owners, since it is pure wood with virtually no pollutants. This can be used as fertilizer on peatland stands, which are very common in the region.
3.2 Description of Eno Energy Cooperative

3.2.1 Cooperative Inception

The cooperative was founded by 12 private forest owners, currently there are 51 members in total. Only one of the founders had some experience of heating plants previously.

“We first of all, I want to highlight the importance of cooperation and good team work. Cooperatives are very different from ordinary corporations. I find modern Japanese leadership culture as the best way to lead our community. Later on our most active founders formed the actual executive board.” Urpo Hassinen, Administrative Manager, Eno Energy Cooperative.

Initially there was some scepticism about the knowledge base and skills, and also the sufficiency of woodfuel resources. The first negotiations concerning the cooperative took place already in 1996, when actual business started in 1999. The founding team had many diversified skills, which made the inception possible.

Prior to the start-up, the consortium visited several existing heating plants, conducted consultations, and studied previous projects carried out by the local forestry centres, this helped them to evaluate the profitability of the plant. Target mapping was also taken up by these projects.

“We needed to network with a number of professionals, such as HVAC experts. There were three major areas where we executed tendering: tubing of the heating network, heating plant construction engineering and heat production equipment. In Finland it is typical that energy cooperatives form a vast network of experts to ensure the success of the operation. What also encouraged us to start the business was the neighbouring, well functioning Tuupovaara energy cooperative. The final major issue in the starting phase was the approval and support from municipal authorities.” Urpo Hassinen, Administrative Manager, Eno Energy Cooperative.

3.2.2 The Strategy

The purpose is to supply heat through the district heating network using wood chips.

“We wanted to support the good cause: use of renewable energy. From the very beginning we considered creating micro economy as a requirement for a new kind of macro economy. We want to think globally and act locally!” Urpo Hassinen, Administrative Manager, Eno Energy Cooperative.

The business encompasses two groups: cooperative members (forest owners) and the customers (heat users). For the members the most important factor is a lower price for the woodfuel than for the alternative energy sources. Previously markets for woodfuel before the construction of the plants were underdeveloped. Thus the cooperative created the market for woodfuel in Eno district. The municipality wanted to profile as a clean and environmentally friendly.

The strategy is to ensure better prices for the forest owner members and to support the use of local renewable energy. All the wood chipped comes from no further than 35 km from the plant. The members feel very proud that they have been able to decrease the CO₂ emissions in Eno.
It is important for the founders to have harmonious relationships and excellent negotiation skills. It should be remembered there is no easy and quick way to gain profits. There needs to be a readiness for voluntary work in the team and a sense of humour is required at times.

3.2.3 Customers and Profitability

The cooperative is the owner of two heating plants at Uimaharju and Alakylä and they maintain also seven other heating plants. These heating plants are maintained by the cooperative personnel, and the fuel of these plants is procured from non-partner forest owners.

All plants provide a nominal heat effect of 9.5 MW in total. The total amount of sold woodfuel is 2,000 loose-m³/year.

The turnover in 2009 was 840,000 € and it has increased remarkably during the last few years. The profit margin has been on the level of 8-15 percent of the turnover and it is shared straightforward between the members.

“When constructing a heating plant, it’s always good to be prepared for later expansion and reserve space for additional construction. We needed to pay a high price due to later expansion close to Uimaharju plant, where a row house area became our customer afterwards. At the moment we are negotiating the procurement of Yläkylä plant, which is now owned by the city.” Urpo Hassinen, Administrative Manager, Eno Energy Cooperative.

The key factors influencing woodfuel demand

The cooperative actively seeks new clients, there is still potential to substitute oil and electricity based heating systems with district heating in the region; especially many companies want to be profiled as ‘green’. The aim is to expand the heating network to new customers, but the price of the heat is still the most important factor is any new development.

Peat production is highly dependent on the summer weather. Wood is, in many cases, the most potential substitute for peat, the results of the peat harvesting season effect greatly the demand for woodfuel during the following heating period.

A significant part of Finland’s woodfuel comes from logging residues and stumps. Therefore the global depression and a recent decrease in the capacity of the Finnish lumber industry has increased the demand of small sized product i.e. thinnings of young stands for woodfuel.
ENO YLÄKYLÄ PLANT

- Commercial operation started: 2000
- Boiler: 0.8 MWth
- Combustion method: mechanical grate
- Feeding: Stoker dischargers and drag chain conveyors
- Fuel storage: 100 loose-m³
- Heated volume 47,500 m³: primary and secondary school buildings, high school, library, sports hall buildings and church hall
- Heating pipe network: 1,190 m
- Heat production: 2,100 MWh
- Controlling: Automated GSM alarm and network connection for adjustment
- Owner: Municipality of Joensuu
- Operator: Eno Energy Cooperative

Figure 5. Eno Energy Cooperative has initiated a negotiation process with the city of Joensuu to buy the Yläkylä plant. City is keen to sell this plant as it’s better to have professional entrepreneurs as owners of the heating facilities as they hold the required expertise. Photo by Urpo Hassinen.
Table 1. Cost structure for Eno’s wood fuel procurement chain and heating process.

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material</td>
<td>One third is procured from members’ forests, rest from other sources, both as 1) stands harvested by the co-operative, or 2) piles of harvested woodfuel. 80-90% of the woodfuel originates from dense pole thickets, rest from final fellings (logging residues).</td>
<td>In Kemera* supported harvesting done by the cooperative the support is 5 – 10 € per solid-m³ and without Kemera subsidy it’s 0 – 5 € per solid-m³. Road side price is 15 – 20 € per solid-m³.</td>
</tr>
<tr>
<td>Storage</td>
<td>Storing on the road side maximum two years</td>
<td>See ‘Raw material cost’.</td>
</tr>
<tr>
<td>Harvesting machines</td>
<td>Independent contrarctors’ machines</td>
<td>The harvesting cost is 12 – 15 € per solid-m³ and forest haulage is 5 € per solid-m³.</td>
</tr>
<tr>
<td>Chipping and crushing</td>
<td>Independent contractors’ machines, which include Kesla cylinder chipper.</td>
<td>3 – 4 € per loose-m³</td>
</tr>
<tr>
<td>Road transportation</td>
<td>Independent contractor’s truck</td>
<td>2 € per loose-m³</td>
</tr>
<tr>
<td>Machines’ translocation</td>
<td>Usually we operate no further than 20 – 35 km from heating plant.</td>
<td>Is included in the road transportation costs, ranges of over 30 kilometres have an extra compensation per km.</td>
</tr>
<tr>
<td>Capital</td>
<td>Two own heating plants using wood chips and the heating networks</td>
<td>no data</td>
</tr>
<tr>
<td>Heating plant</td>
<td>Maintenance</td>
<td>5000 – 15 000 € per year per plant</td>
</tr>
<tr>
<td>Management and</td>
<td>Outsourced to entrepreneurs as a whole.</td>
<td></td>
</tr>
<tr>
<td>personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funds</td>
<td>Subsidies for plant investments and fuel procurement*.</td>
<td>Fuel procurement subsidy 10 – 12 € per solid-m³. Investment subsidies for plant facilities covered 20 – 30% of the total costs.</td>
</tr>
</tbody>
</table>

*Kemera: According to the Act on the Financing of Sustainable Forestry, private forest owners (cooperatives included) can get subsidies for sustainable forest management. Subsidy is provided e.g. for young forest thinning, woodfuel harvesting and chipping.
3.2.4 Woodfuel Supply and Technology

Originally all the timber needed came from the members, today only about 25-30 percent, due to
growth of the business. Only some of the members sell woodfuel for the cooperative. 20 percent
of the woodfuel is harvested from final harvest fellings as arisings and the rest, 80 percent, is
harvested from young forest stands as 1st and 2nd thinnings. Also larger operators harvest the
logging residues in conjunction to industrial roundwood harvesting. The cooperative has a
partnership concerning logging residue supply, with the local Forest Management Association; this
ensures there is sufficiently raw material (10,000 m³/year) available for the plants during the
heating season.

![Figures 6 and 7. Before and after woodfuel harvesting in a young pine stand. Thinning enhances the growth of the remaining stand and improves the quality of the timber. Photo by Urpo Hassinen.](image)

**Description of the procurement chain**

The forest work related to harvesting, chipping and transportation has been outsourced. The
harvesting is mostly done with multiprocessing machines, which are similar to industrial
roundwood harvesting systems. Some of the machines possess multi tree handling option, which
enables integrated harvesting of bulk and woodfuel. Forest haulage is handled with forwarders.

Only 10 percent of the harvesting is done by manual felling, usually two chainsaw operators during
summer period. Part of the woodfuel is measured with the forwarder’s loader scale. Also
measurements of stacks and chip lots are used.

An independent contractor takes care of the chipping. The entrepreneur is regularly informed
about the location of upcoming road side chipping sites. They operate a chipper that is connected
to a truck and they transport the chip load to the heating plants by two trucks (47 loose-m³ of chip
per truck load). This method is the most cost effective.
However, a terminal for chipping and temporary storage would be very useful for cold winter production. This is costly investment and we would need to assess carefully whether building the terminal would be profitable.

3.3 Strengths and Weaknesses

Even though the cooperative might not have the best location for expanding the business, they are able to compete with bigger operators, since they are able to adjust both their woodfuel and heat prices. Large and diversified network is their key asset, which might become more and more important when they need to diversify their business.

“I believe our business will continue strong, but not without challenges. Competition will increase and expansion won’t be as easy as before, since it’s not that profitable to build heating plants further away from the centre of Eno. Emission trading will create an advantage for the bigger plants. Our asset is flexibility: we are able to adjust the woodfuel prices according to the general price level of fuel, residual fuel oil, sod peat and woodchips. So if the prices of alternative energy sources change over 10 percent, we shift also our fuel and heat prices.”

“The ability to work together without having serious quarrels is our biggest strength. We work as a team! Also diversified knowledge and skills that we have within our network make us successful. Although, we see that our operational expansion is possible only to fairly limited extent. As a small town, Eno doesn’t offer endless possibilities and we may not be so competitive on other areas. Thus, to keep up the extension rate, we may need to co-operate more with other similar operators and who knows, maybe unite with some other corresponding operator. From this point of view, we have four energy cooperatives as our neighbours, so enough alternatives to choose from. As a matter of a fact one student is doing a diploma work concerning neighbouring cooperatives’ willingness to work together with us.” Urpo Hassinen, Administrative Manager, Eno Energy Cooperative.
3.4 Contact Information

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Email: urpo.hassinen@metsakeskus.fi

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4 Leivo’s Forest Energy Ltd

4.1 The District

Leivonmäki is a village in the Joutsa municipality. As a forestry operation environment, Leivonmäki is a mixture of lakes, hills and swamps in the heart of Central Finland. The average size of forest holding is only around 30 hectares. The small size of the forest holdings is a challenge for the forest industry. The district proliferates with young forests where thinning is required. Currently there is a balance between the amount of mobilised woodfuel and the regional harvesting capacity.

*Figure 9. Leivonmäki is a rural municipality full with peatlands and forests. Photo by Lasse Lahtinen.*

Oil and electricity are commonly used for heating properties. Nevertheless peat energy and wood energy use are steadily developing. Leivonmäki is located in the target areas of big power plants in Jyväskylä, Mikkeli and Lahti. There are also a number of smaller heating operators in the district.
4.2 Description of Leivo’s Forest Energy Ltd.

4.2.1 Company Inception

“The reason why our company was founded in 2009 was that we wanted to combine the knowhow and skills of various forest workers that we have in the existing network. There were three founders who were experts both in forestry and in the kind of entrepreneurship that is very similar to what we established today. We operate in Joutsa and in the surrounding municipalities. We have up to 20 contractors employed directly and an administrator. In addition we occupy the services of 7-12 independent contractors every year.” Lasse Lahtinen, Business Manager, Leivo’s Forest Energy Ltd

4.2.2 The Strategy

The goal is to trade woodfuel, industrial roundwood and offer high quality forestry services to the customers: the forest owners, plus the forestry and energy industries. Profitable and long term contracts are sought with the impacts on local economy and employment a key values in business.

Even though there were other harvesting companies before Leivo, the volume of woodfuel use has risen remarkably because of their trading business. They have also provided special services; for example road side and field side cutting operations and arboricultural works in parks and other similar sites. They see that new innovations should be continuously created in order to stay in the business.

“We have been very lucky since we got a lot of help in the beginning from our unofficial contact network which includes forest owners and professional workforce. We have learned that every product and process should be experimented during the first period at a relatively small scale. This way we make sure that the operation is profitable at a larger scale. All the people who are thinking of starting a woodfuel company should keep in mind that in this business foreseeing the unit costs and the changes in the operating environment is sometimes quite challenging.” Lasse Lahtinen, Business Manager, Leivo’s Forest Energy Ltd.

4.2.3 Customers and Profitability

The harvested timber is sold to large scale power plants and to consumers of industrial wood. In practice the woodfuel is delivered to the road side, the buyer taking care of delivery to plant. In this model the buyer is responsible for the capital costs of storing and drying the woodfuel.

Customers have been chosen on basis of their geographical position and the price they are able to pay. Majority of the clients have been acquired by active contacts and marketing. The total amount of traded woodfuel annually is approximately 25,000m³ and it is expected that the annual increase in the volume will be significant, 10-20 percent. The company was founded in 2009; one year of operation the turnover was €1.5 million.
The key factors influencing woodfuel demand

“There are several issues that have an impact on the woodfuel demand. First of all, price is one of the most important issues of course. Second, terms of delivery and terms of payment influence on the total demand. Quality requirements have also a great role in this matter. Primarily I predict the woodfuel demand to be quite unstable. Politics, subsidies and unexpected changes in operational environment have a great impact on the demand and it’s almost impossible to predict how they’ll change on the long run. Also predicting customers’ needs beforehand is quite challenging, but very important for our business.” Lasse Lahtinen, Business Manager, Leivo’s Forest Energy Ltd.

4.2.4 Woodfuel Supply and Technology

Private forest owners sell the woodfuel stands and Leivo Company thereafter harvests the woodfuel. They harvest only small diameter roundwood from young forest thinnings. They are not aiming for final crop felling, since the large scale operators have the necessary resources needed for harvesting logging residues. Leivo uses its own staff and external contractors. Harvesting expenses are the biggest element of the unit costs, and therefore proper planning and site selection are essential to avoid unnecessary expenses.

Figure 10. Left without proper care, young stands turn inevitably into far too high density. Through thinning the yield potential of the soil can be directed to selected trees. Photo by Lasse Lahtinen.

There are three different combinations that carry out the harvesting in practice:

1. Manual felling and forwarder,
2. Harvester and forwarder, and
3. Tractor with whole tree harvesting guillotine grapple and trailer.
At the road side storage the company chips the woodfuel and transports it with a truck to the power plant. Chipping is done at the road side by truck-mounted chipper.

The most effective harvesting chain used in the young forest stands with ‘cleaning’ by a chainsaw operator and a clearing saw. The purpose is to remove the smallest stems that would slow the thinning. After the cleaning one of the mentioned harvesting combinations is applied. If the woodfuel is situated in difficult terrain and/or has a lot of small stems the best choice would be manual felling and forwarder.
4.3 Strengths and Weaknesses

In Leivo’s case the political decisions concerning energy subsidies have a great impact on their business. They are a small operator, who need a vast contact network.

“We have the possibility to serve our clients locally and with high quality. Even though we just started the business, we consider ourselves already as a very strong local operator. Our organisation is flexible. Overall, we emphasise simple and cost effective operation models.”

“I see that changing environment causes the biggest challenges for Leivo’s Forest Energy. Since we’re a relatively small operator, we possess quite limited investment ability. Energy and forest policies especially in form of subsidies have a great potential to help our business. I think that political decisions and indecisiveness makes it hard to predict the future of woodfuel supply and demand. Our whole network, customers and employees, have their conclusive role in the business’ success. But it’s good to remember that sometimes it can be all about good luck!”

“Bioenergy and woodfuel are in fashion today. There are a lot of nice words about it, but they don’t necessarily have any proper meaning. To make woodfuel supply profitable, it requires a lot of hard work and judgement based on experience.” Lasse Lahtinen, Business Manager, Leivo’s Forest Energy Ltd.

4.4 Contact Information

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5 Päijänne Forest Management Association

5.1 The District

Päijänne Forest Management Association is situated in Central Finland, operating in the municipalities of Laukaa, Jyväskylä, Hankasalmi, Jämsä, Luhanka, Toivakka and Leivonmäki. The association has 7,800 private forest owner members. Private forest owners’ forest area covers 260,000 ha with the annual growth of 1,540,000m$^3$. The annual logging volume is around 1,500,000m$^3$.

In the region properties are heated with a mix of energy sources, such as local woodfuel, other renewable sources, peat and fossil fuels. In the area there are a couple of major forest industry factories, which produce and use a lot of renewable wood fired energy. Private properties’ electricity heating systems are based on local peat and woodfuel.

5.2 Description of Päijänne Forest Management Association

5.2.1 Purpose of the Association

The Association has taken its current shape in 2004 after several fusions. The Forest Management Association provides services for forest owners. The aim is to increase the value of the forest holdings and to ensure the preconditions for profitable forestry. Association does not buy the woodfuel, only acts as an agent.

“We exist for the forest owners and our actions are based on economical, ecological and social sustainability. Our aim is to increase the value of the forest holdings and to ensure the preconditions for profitable forestry.” Heikki Kuha, Service Manager Päijänne Forest Management Association.

5.2.2 Customers and Profitability

Harvesting and providing woodfuel started in the beginning of 2000t century. The association provides timber to the municipal heating plants and also to some private users. One of the service options for the forest owners is that the association handles the whole sale. Thus they sometimes provide forest owner’s wood other operators, e.g. UPM-Kymmene. The association provides woodfuel 400 GWh annually. The overall turnover has been about €8 million and about €1 million has come from the woodfuel business. The turnover has tripled from the start of the woodfuel business.
The key factors influencing the amount of harvested woodfuel

“Basically, our perspective lies on the needs of the forests and the owners. The volume of harvested woodfuel is primarily dependent on the forests need for thinning. If a young stand is too dense to ensure proper growth, there’s a need for thinning and thus we can provide woodfuel for the buyer. Price has a great importance both for the buyer and seller. I think that woodfuel demand will grow in the near future, since a lot of investments have been done in order to increase its utilisation. In terms of long-span planning and investments it is a good signal for the stakeholders that Finland has committed to cut the CO₂ emissions and increase significantly the use of renewable energy sources.” Heikki Kuha, Service Manager Päijänne Forest Management Association.

5.2.3 Woodfuel Supply and Technology

The woodfuel comes from the members’, church owned and other communities’ forests. The association provides woodfuel both from the young forests and from the final harvest fellings. Typical final cut stand is a spruce forest, from where logging residues and stumps are harvested. Most of the woodfuel comes from young forest thinnings. Timber is harvested by independent contractors, which include both forest machine entrepreneurs and lumberjacks.
The association uses the services of independent contractors, with harvesters equipped with grapples designed for woodfuel harvesting. The buyer transports timber from the road side storage to the final destination. Logging residues are usually chipped with truck-mounted chipper on the road side. The other option includes transporting the timber to a crusher close to the user. This option usually concerns woodfuel including timber which may have a lot of stones and other extra material to avoid injuries to the vulnerable chipper.

5.3 Strengths and Weaknesses

Forest Management Association acts as an agent in the woodfuel trade. Their location is excellent and it’s very probable that forest owners will use their services more and more in the future, since people need expertise in woodfuel issues.

“One of the greatest strengths is our location; we are well placed in respect to the woodfuel users. We have the needed skills and knowledge to provide woodfuel and we have close contacts with forest owners who own the raw material. Profitability and productivity needs to be on a high level throughout the whole procurement chain. I would start with developing the logistical chain and harvesting technology. At the moment the state subsidies have a significant effect on the woodfuel trading and harvesting business.” Heikki Kuha, Service Manager Päijänne Forest Management Association.
6 Conclusions

The previous chapters have explored three different kinds of existing woodfuel supply clusters in Finland. In order to adapt these models different conditions, note the following facts that determine the supply arrangements specific to Finland.

The ownership of the forests is dispersed into small holdings of 735,000 forest owners and there is fairly mild cooperation between the forest owners. Majority of the forest owners belong to statutory Forest Owner Associations.

The forestry authorities also have inclusive databases consisting the forest resources and forest owner information. These factors have been a good ground to build bioenergy promotion actions on, and a greater proportion of the existing forest owner based supply clusters have been originally initiated using an external consultant.

In the Finnish context, the main challenge of the whole business is the profitability of the harvesting phase, especially in young stands. This is mainly due to the high level of staff costs and fuel in comparison to the price of the woodfuel produced. Currently it seems that for a small business it is most profitable to cover the whole procurement chain from the forest to the plant. Most of the added value comes from the chain between the road side storage and combustion.

The inception phase of woodfuel businesses it is a great advantage to have a wide contact network which provides adequate experience on the primary issues. This also seems to be the most effective way to find customers: both woodfuel suppliers and users. The easier but most expensive option is to outsource the planning and construction work partially or as a whole to professional consultants.

In the cooperative model it is very important to have good team spirit and good will without forgetting the business approach – in the end the aim is profit. The key strength is the effective team work and also a set of diversified skills and knowledge.

In a small corporation the lack of hierarchy between the workers makes the business successful. Simple and cost effective operation models play also a significant role. Both the corporation and
association stressed the importance of the location - close to the customers. In PFO-associations the close contacts with forest owners seems to be one of the key strengths.

Tapio would like to thank Mr. Urpo Hassinen from Eno Energy Cooperative, Mr. Lasse Lahtinen from Leivo’s Forest Energy Ltd. and to Mr. Heikki Kuha from Päijänne Forest Management Association for their valuable assistance with this report.