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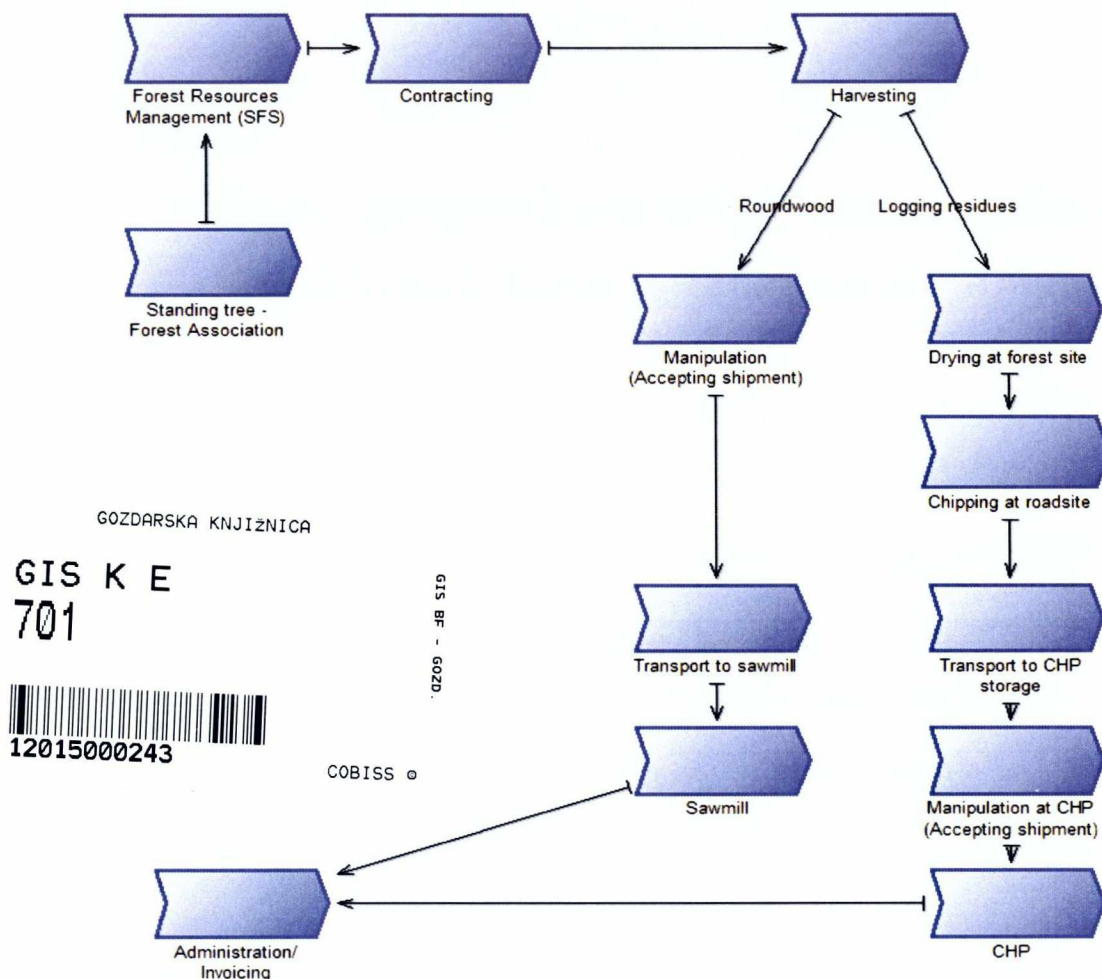
## Sustainable Networks for the Energetic Use of Lignocellulosic Biomass in South East Europe

<b>Work package</b>	<b>WP3</b>
<b>Title</b>	<b>Descriptions of three pilot SCORPS studied in Slovenia</b>
<b>Version</b>	<b><i>Date: 6.2.2013      Status: Final version</i></b>

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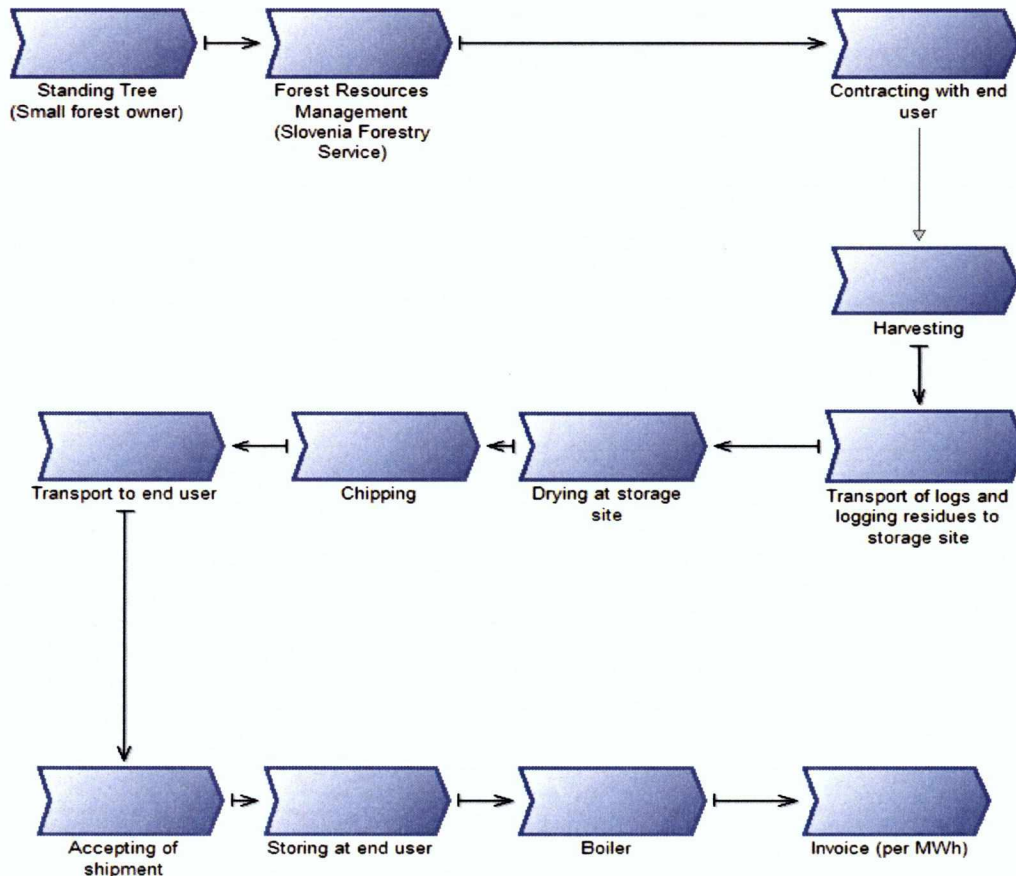
**Forest Association – CHP (This is our main supply chain that will be analysed in detail.)**



This supply chain is describing a process map from large scale forest (Forest Association) to CHP plant. First process in this chain is Forest Resources Management for the defined forest (owned by Forest Association). Forest Management plan is provided by Slovenian Forest Service, where the annual cut is foreseen. This process is followed by contracting – agreements with sawmills about purchase of roundwood and with CHP about purchase of wood chips; contracting with forestry companies that will perform harvesting, chipping, transporting. Next process is harvesting, from where this supply chain is divided in two different routes. First route is roundwood flow and the second is logging residues flow. In roundwood flow next process is manipulation/accepting shipment, where manipulator checks the quality and timber sortimentation on forest road and he also measures the quantity of timber. After that transport to sawmill is followed. When timber is being used at sawmill there is left only the process of Administration/Invoicing and payment to Forest Association. Logging residues flow consists from different processes. First process is drying at forest site to reduce the water content of wood residues, which is followed by chipping with wood chipper at forest site. Next is transport of wood chips to CHP, where wood chips are stored and measured (Manipulation). At the end there is process of Administration/Invoicing and payment to forest owner, who further on divides the money among the contractors in the whole production chain.

## Small scale forest owner – Boiler house

In process Small Scale Forest - Boiler house Powered by ADONIS Community Edition 05.02.2013, 10.01.12

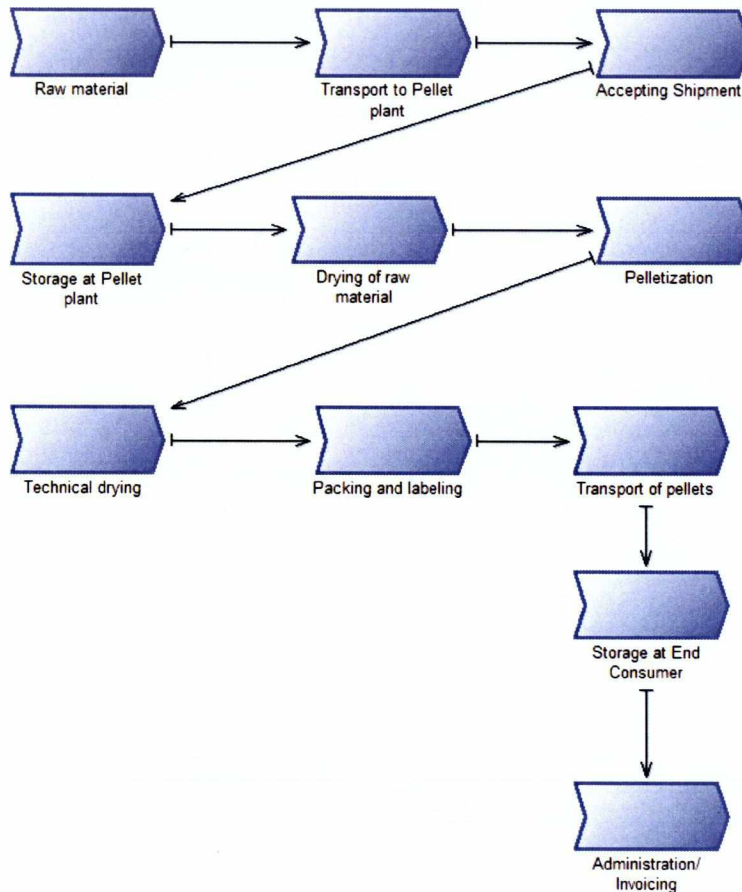


This supply chain is describing a process from small scale forest owner to boiler house at end user. Forest Resources Management for the defined forest (owned by small forest owner) is provided from Slovenian Forest Service, which prepares a forest management plan where the annual cut is being foreseen. This process is followed by contracting – contracting with end user about needs for wood fuels and quantities of it. Next process is harvesting, which is performed manually with chain saw and forest tractor. All the works are done by the owner itself. After that logs and logging residues are transferred to storage site, where the raw material is dried. Next process is production of wood chips with a wood chipper owned by the forest owner itself. After the chipping wood chips are transported to end user, where first the shipment is accepted (samples for analyses are taken). Next process is storing of wood fuel in storage place. In the end wood chips are being paid by produced heat (MWh) to forest owner.



## Raw material – Pellet End User

In process Raw material Powered by ADONIS Community Edition 05.02.2013, 13:06:04



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**Raw material** is not meant as a process, but more likely as a starting point. Raw material in our case comes from sawmills. At this stage it is very important to know the sources of raw material which has the biggest impact on the quality of pellets.

**Transport** is in most cases done by road with containers for bulk haul. Loading and transportation to pellet plant is included in this process.

**Accepting Of Shipment** is a process for quantification and qualification of raw material that has been purchased from sawmills. For example: weighting of full and empty truck.

**Storage at Pellet plant** is a process where unloading of raw material happens.

**Drying of raw material** is important and very expensive process before grinding of raw material. Here several different processes are possible, but the output must be a dry material (10-12% of water content) for grinding.

**Palletisation** is a set of different processes. Here grinding come to turn, size of raw material is also very important for quality of pellets. The main principle is that the smaller the particles are the better the pellets will be. Another process included in palletisation is mixing different qualities of raw material and additives for durability and quality of pellets. After this come the main and the most important process that is jamming (pressuring) with rotational mills.

**Technical drying** – The pellets comes from mill very hot and humid. Cooling down is done on the conveyor belt where ventilators are blowing dry air form side. The regulation of drying time can be done by regulating the length of conveyor belt.

**Packing and labelling** can be done in different dimension. For households usually packing comes in small 15kg bags, for bigger consumer's big-bags or silo can be filled.

Land transportation is meant for **Transport of pellets**. Pellets has to be treated carefully, because they break up at every transport point, so more we handle them more they break up and the greater the loss is. It can be done with bulk trucks or any other truck.

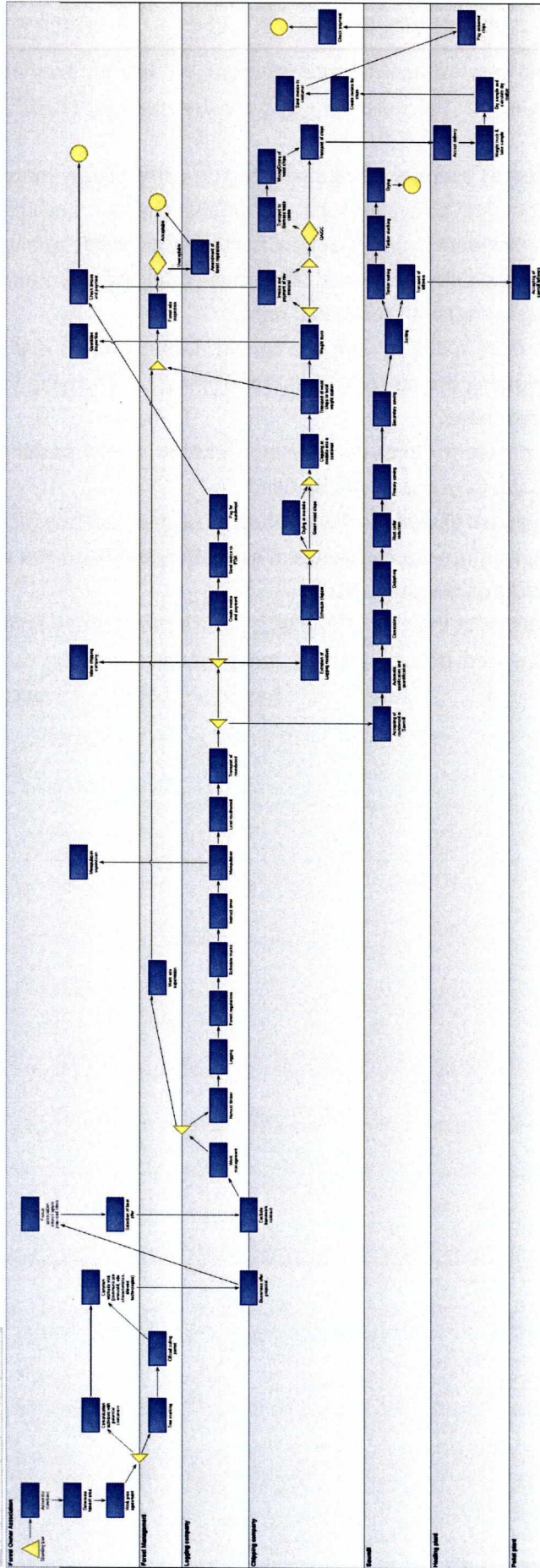
**Storage at End consumer** is the last process in the chain of pellets, before they burn in boiler.

**Administration/Invoicing** comes on the end of supply chain, where invoice is being accounted to buyer and payment to seller has been accomplished.



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Figure: Detailed process model



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