6. Setting up the production chain

The process of building the supply chain started with the involvement of territorial stakeholders to analyse the present-day biomass market situation and the feasibility of a short supply chain based on environmental, social and economic sustainability. During numerous public meetings and roundtables, it emerged that biomass produced in the Park area is entirely absorbed by thermal power plants of Crotone and Cosenza provinces.

The Park has therefore started a process to elaborate and share with stakeholders a different approach to forest resources management whose pillars are the short supply chain, environmental and social sustainability and the promotion of local scale energy districts. The aim was to re-direct a part of the biomass stored by local producers to supply small stations inside the Park area. Such an approach raised the interest of biomass producers but had to deal with the problem of finding local plants fit for biomass combustion.

Thus, the Park has elaborated a strategy based on two steps: during the first step, the Park itself would play the role of final biomass user. Consequently, the Park has issued a public call for tenders for the supply of pellet to 6 stations that had been recently converted from diesel and log thanks to national funding. The contract fixes the price at 4.2 €/15 kg bag, which will be paid by 3 public and private actors interested in participating in the supply chain.

The second step is based on the involvement of public bodies and economic actors (including hotels, restaurants, farms) in the SNP area in order to start a process of conversion of thermal power plants, including domestic ones - also emphasising incentive measures existing in national and regional programmes - and finally take part in the supply chain.
1. Description of the park

Sila National Park has been set with the Regional Decree 14.11.2002 published on the Official Journal num. 63 - 17/03/2003 and at the same time the Management Agency has been founded. It includes the territories formerly part of the “Historical” Calabria National Park (1968). It protects areas of great environmental interest in Sila Piccola, Sila Grande and Sila Greca, for a total of 73,695 hectares. The Sila National Park includes some of the most interesting areas in Calabria Region, its large forests are situated over plateaux spreading from Pollino mountains to Seite mountains. There are many rural villages and a rich cultural and artistic heritage. The highest mountains are Botte Donato (mt. 1926), in Sila Grande and Ganglione (mt. 1764) in Sila Piccola; there are many torrential rivers and artificial lakes with several utilizations. The fauna, both permanent and migratory, is numerous and diverse. The economic income of wood, assured for centuries by the wood crop, has characterized life in the National Park. Locally used as the main building material for houses, the wood has been, and continues to be, the leading production in the carpentry sector of building and in the little semi-industrial and hand-crafted joinery handworks. The woody essences of larch pine and chestnut-tree are mainly used, because of their features of endurance face of parasites and durability in time; and again the beech, the maple, the oak and even the strawberry-tree and heather, last used in the ebeny field restoration.

2. Wood biomass potentials in the park

As already mentioned, about 80% of the area of Sila National Park is covered with forests. More precisely, forests cover about 60,000 ha out of 73,693 ha. Except for Integral and Biogenetic Reserves (property of the Region) and areas owned by the municipalities, forests are privately owned. This is why private owners were invited to take part in the meetings held by the SNP to discuss the biomass supply plan.

3. Description of production chain

Following the procedure is used by most of the forestry companies operating within the SNP territory:

- **Felling** - Felling consists in cutting the tree at the bottom. This operation is generally carried out with chainsaws and other tools able to determine the felling direction, such as wedges, felling levers, tackles, etc. The operator has first made the undercut and then felling cut.

- **Processing** - It includes delimbing, cross cutting, detaching where necessary. DELIM and cross cutting are carried out through the chainsaw and manual tools such as bush knives and axes. This operation can be carried out either in the felling point or in the landing area, after extracting the whole or delimbed trees.

- **Bunching and extraction** - The cross-cut wood or the long stems are first moved from the felling point to the strip road, along which they are later brought to the landing. The landing is an area dedicated to the gathering of wood and it is accessible by roads suitable for heavy vehicles.

Chipping - This operation involves reducing woods of different kind and form in small-sized pieces (called chips), through a mechanical cutting. In the use of biomass for energy purpose, chipping can be carried out in the forest, this shows some advantages compared to traditional bunching techniques.

Pelletisation - Wood chips and sawdust obtained from first wood processing will be transformed into pellet which will then be supplied to SNP heating systems. The material supplied will have to comply with UN standards.

- Lower calorific value >18.5MJ/kg.
- Moisture content <10%
- Ashes <0.7%
- Diameter 5-6 mm.

Each supply must be accompanied by ENPLUS-A1 certification.

4. Description of producers, suppliers of wood biomass

Most of the forestry companies existing in the SNP area have been invited to take part in round tables and specific meetings. The choice of actors to be involved has been made taking into account the capacity to create the supply chain and to maintain it in the future. In particular, target forestry companies would have the following characteristics:

- Without regard to juridical status, target companies need to rely on a team of qualified workers and a number of forestry machines suitable for the creation of a short supply chain.
- Moreover, the company has to be included in the regional register of forestry companies with specific reference to forestry works, environment restoration, biomass chipping, reforestation, restoration of degraded forests, wood transportation.

4. Description of end users

Analysing the flows of biomass that is currently produced within the SNP area, it results that the destination of wood biomass are thermal power stations in Cotrone and Consenza provinces. Thus, the final user is GSE (national manager of energy services). As a consequence, all the energy produced from SNP biomass enters the national system with no direct advantage for the local territory.

This project proposes a new approach to solid biomass valorisation, based on social and environmental sustainability and directed to promote the utilization of biomass inside the harvesting area. This would, on the one hand, reduce transportation costs and, on the other hand, ensure the supply to small and very small-scale local stations.

In order to favour this process, during the first year of activity of the supply chain the Park has played the role, as further described in the next paragraph, of final user of biomass and has issued a call for tenders to purchase pellet form local suppliers.

The biomass purchased will be destined to 8 heating systems in buildings managed by the Park that have been converted from diesel and log to pellet; their technical specifications are showed below:

<table>
<thead>
<tr>
<th>N.</th>
<th>Structure</th>
<th>Municipality</th>
<th>Prv</th>
<th>Fuel</th>
<th>Brand</th>
<th>KW</th>
<th>Final users</th>
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<tbody>
<tr>
<td>1</td>
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<td>Lorca</td>
<td>Cs</td>
<td>Pellet</td>
<td>Paspalilloch</td>
<td>208</td>
<td>Staff and Visitors</td>
</tr>
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<td>2</td>
<td>Cunaione Seghiena - Museum</td>
<td>Spezzano S.Is</td>
<td>Cs</td>
<td>Pellet</td>
<td>Paspalilloch</td>
<td>208</td>
<td>Visitors</td>
</tr>
<tr>
<td>3</td>
<td>Cunaione study center</td>
<td>Spezzano S.Is</td>
<td>Cs</td>
<td>Pellet</td>
<td>Paspalilloch</td>
<td>27</td>
<td>Visitors</td>
</tr>
<tr>
<td>4</td>
<td>Longobucco Museum</td>
<td>Longobucco</td>
<td>Cs</td>
<td>Pellet</td>
<td>Paspalilloch</td>
<td>92</td>
<td>Visitors</td>
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<tr>
<td>5</td>
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<td>Lorca</td>
<td>Cs</td>
<td>Pellet</td>
<td>Paspalilloch</td>
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</tr>
<tr>
<td>6</td>
<td>CTA - Case di Melo</td>
<td>Longobucco</td>
<td>Cs</td>
<td>Pellet</td>
<td>Palaizetti</td>
<td>15</td>
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<td>Taormina</td>
<td>Cs</td>
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<td>Spezzano S.Is</td>
<td>Cs</td>
<td>Pellet</td>
<td>Palaizetti</td>
<td>15</td>
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