

WOOD SUPPLY CHAIN

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European Regional Development Fund



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BB-CLEAN

INTRODUCTION

Wood biomass for energy purposes is a renewable source that could replace the combustion of polluting oil products. Recently, following Kyoto Protocol, the biomass use for energy purposes has been promoted, at European and at national levels, in planning documents and through various economic incentives.

In the followings sections we report some local biomass supply chain analysis, as collected by project partners and observers for these areas:

1. Chamonix Valley Municipalities
2. Slovenia
3. Aosta Valley

The purpose is to benchmark, when possible, the state-of-the-art of wood supply chain by a “SWOT” analysis, based on surveys and reports already available when the “BB-Clean” project has started. These reports show different levels of knowledge and data quantity; at the moment, they have a good analysis level only for the three listed areas. Until now the project doesn’t include new surveys or an up-to-date of the existing ones.



WOOD SUPPLY CHAIN IN CCPMB + CCVCMB (Chamonix Valley)

In 2017, this is the “state-of-the-art” about forestry industry:

local wood biomass producers			
cut format	number	company size	production (m ³) - sold on the territory
wood logs	10	SME/Municipality	710
chips	1	SME/Municipality	320

About pellets, there is not a local producer. Local consumption is estimated around 18000 tons per year (selling average level).

A SWOT analysis for the selected area can underline these factors:

Strengths	Weaknesses
A forestry charter was signed and someone works on regrouping the lands of private forest owners.	The majority of the forests are private and on steep slopes which makes them hard and expensive to harvest. The air quality issues due to biomass burning have had an impact on the sales of wood
Opportunities	Threats
Awareness raising campaign on local biomass availability	Impact of air quality due to BB on wood prices



WOOD SUPPLY CHAIN IN SLOVENIA

The wood supply chain in Slovenia is represented by these data:

Local wood biomass producers

Number	Company size	Revenues	Employees
982	micro	€ 48.805,50	2-9
26	small	n/a	10-49
4	medium	€ 33.558.250,00	50-249

Production quantities, in Mm3

2017: deciduous (leaves) 1,604 2017: Pinophyta 2,905							
existing wood species logs		Energy production			Other applications		
		chips	pellet	export	building, furniture	pulp, paper	
<i>Fagus sylvatica</i>	Beech	2014: 1,172 2015: 0,798 2016: 0,913 2017: 0,661			2017: 0,846	2018: 0,95 2019: 0,17	2018: 0,31 2019: 0,20
<i>Quercus</i>	Oak						
<i>Acer</i>	Maple						
<i>Fraxinus</i>	Ash						
<i>Populus</i>	Poplar						
<i>Picea</i>	Spruce	2017: 0,044			2017: 1,184		
<i>Abies</i>	Fir						
<i>Pinus</i>	Pine						
<i>Larix</i>	Larch						

A SWOT analysis for the selected area can underline these factors:

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> - equipment - knowledge 	capacity: <ul style="list-style-type: none"> - employees - companies - export 	<ul style="list-style-type: none"> - higher added value - wood processing 	<ul style="list-style-type: none"> - wood prices - small forest owners

Here attached an interesting case study of a Slovenian factory involved in the biomass sector:

Biomasa Nazarje – BLTC

<p>Company</p>	<p>Biomasa d.o.o., Krnica 52, 3334 Luče – mail: info@biomasa.si WEB: http://www.biomasa.si/biomasin-biomasni-center-bbc-nazarje</p>
<p>Why is this BLTC selected as an example of good practice</p>	<p>The company has contracts for wood supply with local forest owners. They also use wood remains from local wood processing industry.</p>
<p>What are the main services of selected BLTC and target customers</p>	<p>The main service of Biomasa Nazarje BLTC is providing for local and regional biomass users. Woodchips are mainly supplied to large district heating plants.</p>
<p>Technical description of BLTC (equipment, machinery, employees, quantity of wood fuels, etc)</p>	<p>50.000 m² open areas for storage 7000 m² of covered areas for storage and production 170.000 m³ natural dried wood chips per year 80.000 m³ technically dried wood chips per year 10.000 tons of pellets per year Transmission equipment for dosing and loading Equipment for air supply Central control system - CNS 2 flow driers to dry wood chips Flow facilities for the preparation of raw material for pellets Pellet mill, with a capacity of 1500 kg per hour Packaging device for packaging pellets into bags Front loader Volvo (volume 14 nm³) Front loader ICB (volume 3 nm³) Trailer Fliegl, with the push wall Trailer Fliegl with blow fan Chipper Bentele BBT 1500 (One of the largest mobile chippers in this part of Europe), Capacity of 400 Nm³ per hour. Chipper Eschböck Biber 92 (capacity of 130 Nm³ per hour)</p>

Financing and ownership	Private owned company
Description of positive criteria for selection of this location	Location in forestry area
	Very cost efficient centre
	Private investor
	Optimized in whole aspects
	Connection with local environment. Supply contract with local and smaller forest owners
	Connected with local wood processing industry

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CONCLUSIONS

Aosta Valley land area is 3263,2 km2. For administration it is composed by:

- Aosta, the main town
- other 73 Municipalities, forming groups called "Municipality units".

Public property woods amount to 38.207 ha (39%) while private woods occupy 59.763 ha (61%).

Benchmark between different data sources of forestry areas of the Aosta Valley in the last 40 years:

Data source	hectares	
1980 (Aosta Valley Forest card)	92036	
1985 (Italian National Forest Inventory)	84600	
1994 (IPLA Inventory)	86550	
2005 (National Inventory of Forests and Tanks Forestry of Carbon)	98439	
2011 (Valle d'Aosta Forest Charter - Renerfor)	Legislative Decree 227/01	93930
	FRA2000	4040
	Total	97970

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All forest categories existing in Aosta Valley, according to the 2011 Forest Chart, are so distributed: ►

An essential factor that determines the possibility to improve wood cutting is the presence of roads to transport wood from the cutting point to the final user.

The Region road network is approximately 73% characterized by multiple functions while the remaining 27% is strictly devoted to the wood supply chain, made of tracks and roads serving woods and pastures.

larch and stone pine	43%
spruce	14%
scots pine forests	10%
maple-basswood-ash	6%
other	6%
chestnut tree	5%
oaks	4%
pine	3%
scrubs and invasion	7%
fir	2%
Total	100%

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The Region road network is approximately 73% characterized by multiple functions while the remaining 27% is strictly devoted to the wood supply chain, made of tracks and roads serving woods and pastures.

Municipality units	Roads for multiple use, km	Roads for pastures and forests, km	Total, km
Valdigne Mont Blanc	380	120	500
Grand Paradis	677	225	902
rand Combin	473	108	581
Mont Emilius	760	233	993
Monte Cervino	529	249	778
Evancon	294	269	563
Mont Rose	294	68	362
Walser – Alta Valle del Lys	107	11	118
Total	3514	1283	4797

What is the global potential wood production?

Overall, the average timber volume from Aosta Valley woods is around 15000 m3 per year.

There are currently around twenty local forest enterprises operating in the forest sector, most of which deal with both forestry and processing uses and trade in firewood. Some companies produce and distribute wood chips.

Furthermore, the activity of selling firewood is often carried out by the approximately fifteen sawmills of small and medium dimensions placed on the regional territory, including a plant for pellets production with a potential of about 6-7000 t/year. However, all the fir sawdust used for pellet production is imported from neighboring territories, particularly from France.

Considering the only usable forest areas (32.000 ha, about 39% of total woods with potential active management), the availability reaches approximately 93.300 tons per year, with 54.400 tons useful for energy purposes:

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Potential biomass wood cutting in Aosta Valley, tons per year

tonns per year	deciduous		%	conifers		%	Total
	Public	Private		Public	Private		
Chips A	418	7974	41%	5013	7276	59%	20681
Chips B	211	1327	13%	4263	5818	87%	11619
Wood burning	568	8565	41%	6522	6433	59%	22088
Poles	67	1767	100%	0	0	0%	1834
Construction	128	2185	6%	15465	19318	94%	37096
TOTAL	1392	21818		31263	38845		93318



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Wood chips are wood reduced in homogeneous pieces (3-5 cm long), obtained by mechanical shredding residues from forest (wood waste, twigs and tops, agricultural pruning recovery). The main difference is:

- type A is mainly implied in small and medium-sized plants;
- type B reaches larger plants, such as for example district heating plants.

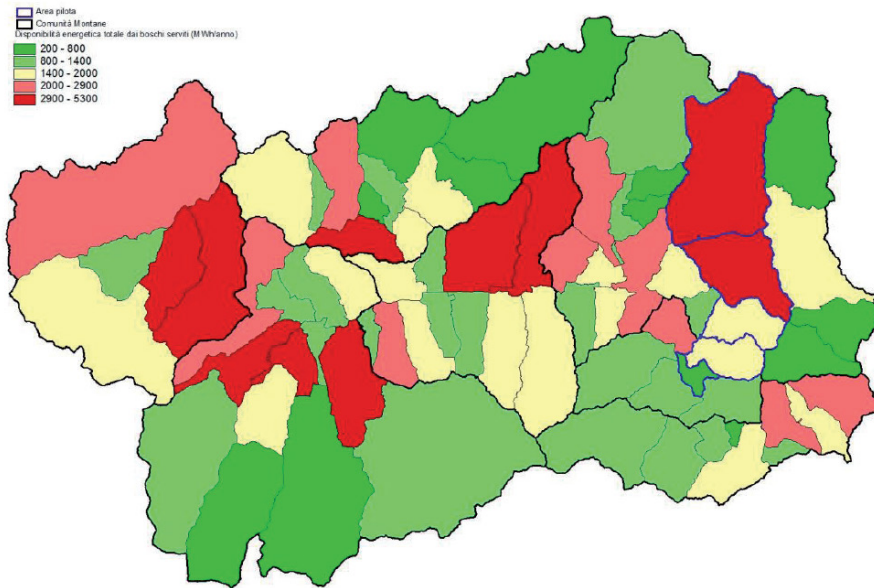
Quality characteristics are defined by the UNI EN 14961-4: 2011 standard.

A further important differentiation concerns the good assortments for energy purposes, settled in two classes of water content: M50% and M20% and the related energy potential, expressed in MWh.



Firewood and wood chips potentially available in the served woods:

	tons per year						MWh per year			
	Firewood		Chips A		Chips B		Firewood	Chips A	Chips B	
	M50	M20	M50	M20	M50	M20	M20	M20	M50	
deciduous	9133	5480	8391	5035	1538	923	21919	20139	3690	3429
conifers	12955	7774	12289	7374	10081	6048	31095	29494	24194	22480
TOTAL	22088	13254	20680	12409	11619	6971	53014	49633	27884	25909



Potential energy distribution : burning wood M50, chips A and B M50



In brief:

The analysis of forestry for energy production divides Aosta Valley into three parts:

- ▶ the central valley municipalities, between Montjovet and the regional border towards Piedmont, are characterized by high availability of log firewood, due to the presence of large deciduous populations;
- ▶ the municipalities of the central Valley portion, from Aise to Saint-Vincent have an average high availability of biomass affordable for energy production, but, at the same time, they suffer from a great distance between production places and potential consumption points;
- ▶ some top municipalities of the some valleys (e.g. Cogne, Ayas, Gressoney and Valdigne) are characterized by a great forest extension with short distance between forests and urban agglomerations, that are potentially good consumption centers, related to the considerable tourist and hotel development sector.

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Following assessments of socio-economic opportunities, Aosta Valley tries to privilege short supply chains mainly allocated to supply diffused small heating systems.



WOOD SUPPLY CHAIN - SWOT analysis benchmark

Parameter	CCPMB + CCVMB (Chamonix Valley)	Slovenia	Aosta Valley
Strengths	- A forestry charter was signed and someone works on regrouping the lands of private forest owners.	- Equipment - knowledge	- central valley municipalities characterized by high availability of log firewood; - central Valley municipalities with high availability of biomass affordable for energy purposes - some top municipalities characterized by a great forest extension with short distance between forests and urban agglomerations
Weaknesses	- The majority of the forests are private and on steep slopes which makes them hard and expensive to harvest. The air quality issues due to biomass burning have demonstrated an impact on the sales of wood	- capacity: - employees - companies - export	central Valley municipalities characterized by great distances between production places and potential consumption points
Opportunities	Awareness raising campaigns on local biomass availability	- higher added value - wood processing	some top municipalities are potentially good consumption centers, related to the considerable tourist and hotel development sector
Threats	Impact of air quality due to BB on wood prices	- wood prices - small forest owners	Impact of air quality due to BB on wood prices



CONCLUSIONS

The current economic and energy situation often involves the Administrators in proposals for energy production from biomass, aimed at both promoting environmental sustainability (reduction of fossil fuel consumptions and related CO2 emissions) and at obtaining economic savings.

However, the “wood - energy” supply chain is often complex. Good forest management, inspired by the principles of sustainability, must take place respecting the territory and the multi-functionality of the “forest system”, combining the economic aspects of the demand for timber for energy purposes with conservation biodiversity, soil protection, tourism, and the long-term conservation of the forest her-

Moreover, the environmental benefit is maximized if a “short supply chain” is implemented, with biomass coming from neighboring areas. So, when analyzing the potential of some of the territories involved in BB-Clean project we can notice, in general, that the wood supply chain could improve, giving good economic revenues, but there are difficulties related to the territory, to orography, to transport. These factors, among others, make difficult to find common aspects for a benchmark.

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