Biomass to Energy options to avoid open burning emissions: an Italian successful case study

Ottawa, 24/10/2019

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Bioenergy plant at Calimera, Apulia, Italy
A biomass case study in southern Italy

WHAT?

• An energy power plant fed by local biomass

• Olive pruning are harvested and collected to feed the energy plant

• They produce electricity and partially recover thermal energy

• The plant is currently «fedded» by around 2400 farmers

WHERE?

Areas where Olive tree prunings are collected
Biomass and power plant features

- Use only olive prunings
- Harvesting directly managed
- 24-28 tons/day
- Average humidity 20%
- 8000 tons/year
- About 2400 farmers involved

- 1 MWe power
- 24-25 % efficiency
- Around 8000 MWh x year
- ORC turbine
- Advanced filtering system
- Heat recovery (in progress)

A private enterprise who started in 2010 from the growing awareness about open burning impacts and the unexploited energy potential
Olive groves pruning

Large trees!

Pruning is:

• Time spending
• High cost

Before the FIUSIS power plant

Traditional use or destiny of prunings were....

Shredding on ground (Phytosanitary aspects)

Open burning (Fire risk)

Domestic Wood stove (only larger branches)
Harvesting and chipping on-farm

Chippers in action

and

Chipped pruning pile

Harvesting machineries

Olive prunings in small groves

• Harvesting and direct chipping
• Includes small branches and leaves
## Logistic organization for larger farms

### Value chain 2: for fields > 400 trees

<table>
<thead>
<tr>
<th>Manual pruning and preparation of branches</th>
<th>Forwarding prunings to piles</th>
<th>Biomass piles at field side</th>
<th>Chipping: static chipper fed with hydraulic arm mounted on spider. Direct discharge on truck or trailer</th>
<th>Transport to plant</th>
<th>On-site storage and energy conversion</th>
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- **Farmers**
- **Ligna**
- **Fiusis**

Hundreds Owned by Fiusis Main society

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### Static Chipper

*Used for olive prunings chipping at larger farms*
**Biomass storage**

**Biomass storage at power plant site**

- 400 tons
- Chipped
- Covered

*Chipped biomass is stored at plant level for a short period and then moved to feed the plant*

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**Plant layout scheme**

- Biomass feeding
- Boiler
- Mobile grate
- Air control systems
- Multicyclon system
Ashes recovery and management

Ash recovery systems:
- «Heavy» ashes from combustion chamber
- Light ashes from multicyclon and filtering systems.

Chimney emission monitoring

- Exhausted gas are filtered to remove particulate matter
- At the chimney top a monitoring system check gas composition
- Continuous monitoring
Emission control system

The reason why… it was successful

- Incentives to renewables
- Reliable and affordable technologies
- Logistic organization
- Harvesting technologies
- Local farmers involvement
Before….

The Fiusis initiative has been selected by the The Rural Business Innovation Awards as one of the best initiative in the field of green economy by Rubzimo.

We are grateful to Dr Matteo Monni from ITABIA and Dr Vincenzo Alfano from CREA that provided pictures data and information and to Mr Marcello Piccinni that gave us the opportunity to present the Fiusis experience.

Further information could be asked at marcello.piccinni@fiusis.com.

ICCI Open Agricultural Burning Workshop – Ottawa – 24 10 2019