



Agenzia nazionale per le nuove tecnologie,
l'energia e lo sviluppo economico sostenibile

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



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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 «fed» by around 2400 farmers



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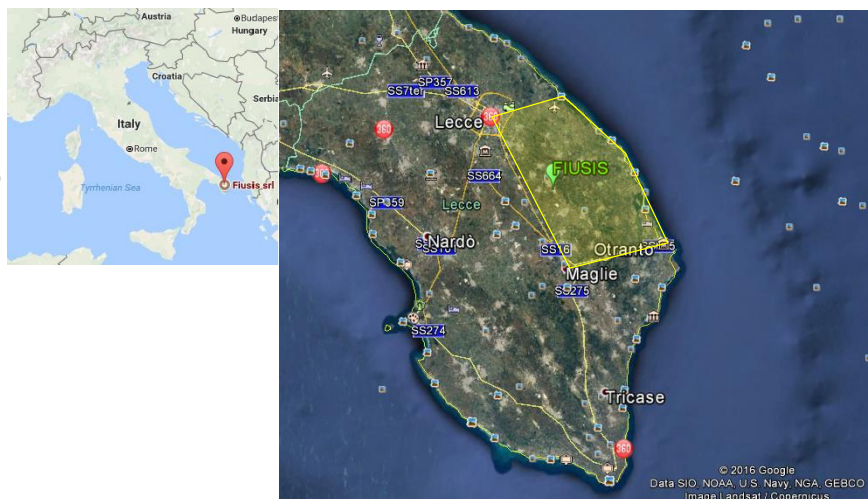
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A biomass case study in southern Italy

WHERE?

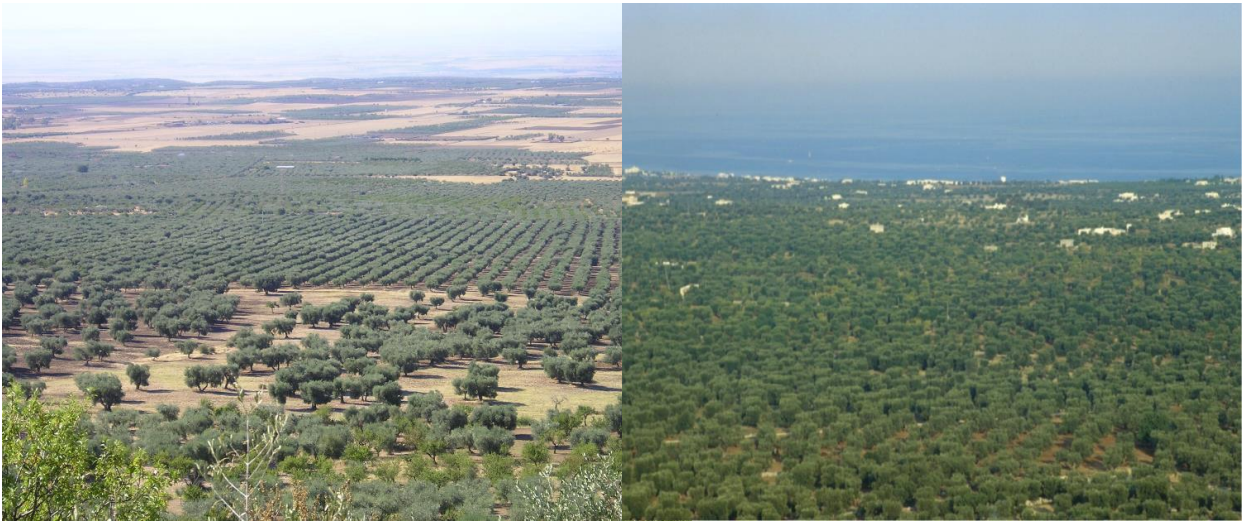
Areas where
Olive tree prunings
are collected



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Olive trees landscape



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Biomass and power plant features

- *Use only olive prunings*
 - *Harvesting directly managed*
 - *24-28 tons/day*
 - *Average umidity 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



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Olive groves pruning

Large trees!

Pruning is:

- Time spending
- High cost



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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)



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Harvesting and chipping on-farm

Chippers in action

and

Chipped pruning pile



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Harvesting machineries

Olive prunings in small groves

- Harvesting and direct chipping
- Includes small branches and leaves

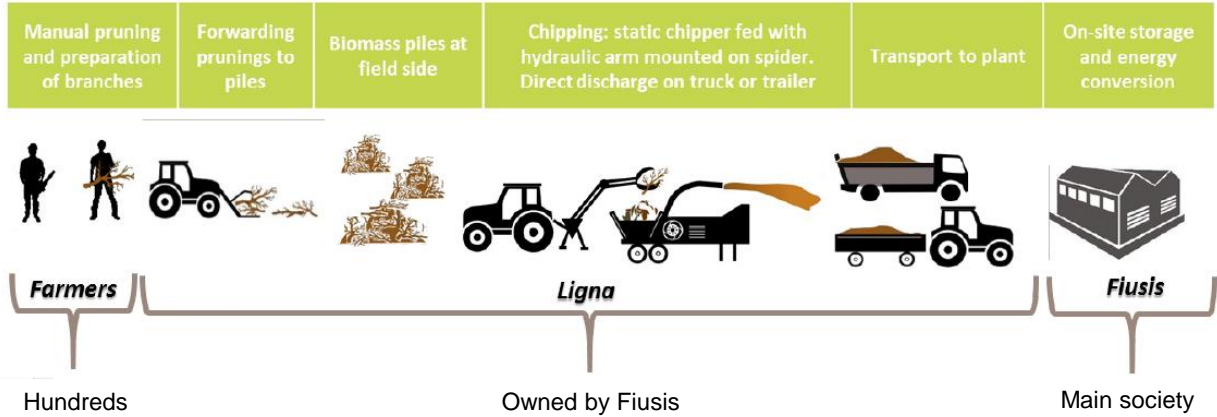


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Logistic organization for larger farms


Value chain 2: for fields > 400 trees



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Static Chipper

Used for olive prunings chipping at larger farms





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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



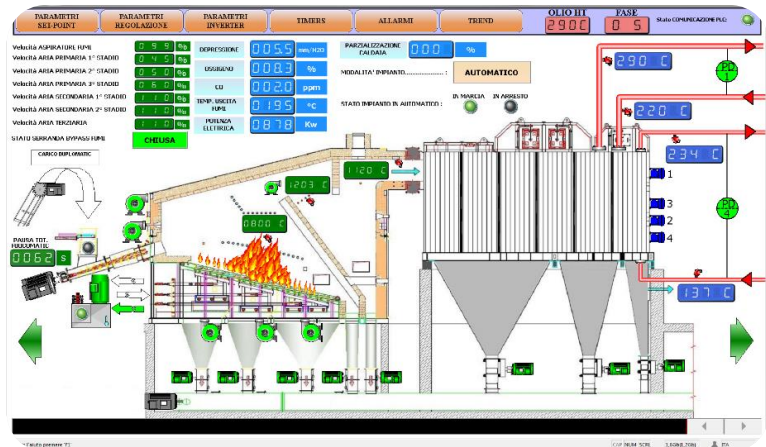
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Plant layout scheme

- Biomass feeding
- Boiler
- Mobile grate
- Air control systems
- Multicyclon system



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Ashes recovery and management



Ash recovery systems:

- ← • «Heavy» ashes from combustion chamber
- Light ashes from multicyclon and filtering systems. →



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Chimney emission monitoring

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

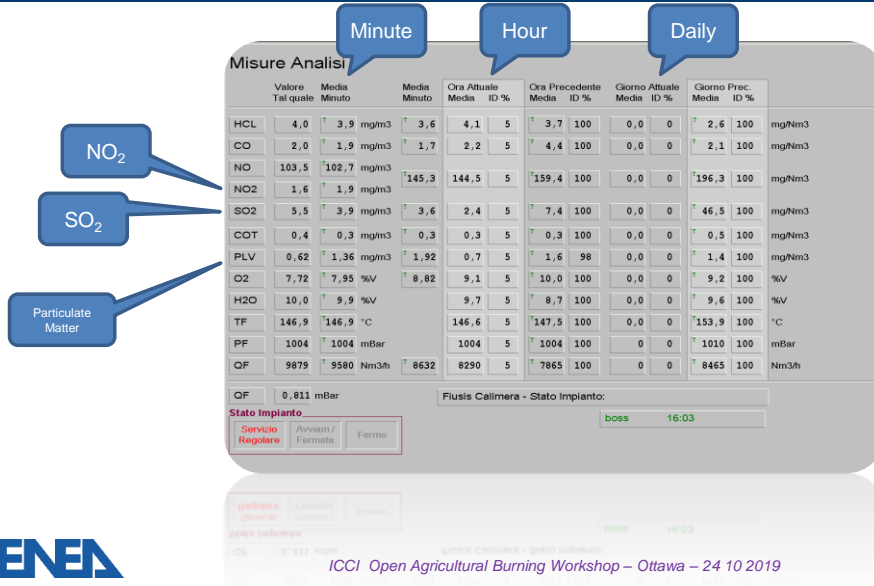


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Emission control system



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The reason why....it was successful



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Before....



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 Italian Biomass Association

Φ FIUSIS *Energia dal Legno*



*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*

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



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