

# Agrobiomass in the European context

Irene di Padua  
Bioenergy Europe

2<sup>nd</sup> December 2021

**Bioenergy**  
EUROPE

#bepartofbioenergy



# Bioenergy Europe's Members

## Companies



## Associations



## Academia



# Our Working Groups

Members Only

## Agrobiomass & Energy Crops

Promotes underutilized biomass feedstocks (e.g. residues from agriculture, dedicated perennial lignocellulosic crops) through ad hoc policies.

## Pellets

Discusses common issues and opportunities regarding the development of the European pellet market (residential, commercial, industrial) and proposes actions to overcome current barriers.

## Domestic Heating

Promotes biomass in the domestic heating sector and discusses building regulations, air emissions and stove & boilers certifications.

## Competitiveness

Provides updates on key existing and emerging policy topics determining the competitiveness of bioenergy sector within the EU (e.g. carbon tax, state aid)

## Sustainability

Monitors climate and energy legislation impacting the European bioenergy sector and advocates for an efficient EU sustainability policy for biomass for heating and electricity production.

## Wood Chips

Provides with active exchanges of data, market trends and news in legislation.

## Biopower & CHP

Provides with updates on key EU developments and allows for exchanges on policy & market intelligence relating to the role of bioenergy in power and heating sectors.



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1. **Agrobiomass in the EU context**
  2. **Barriers and solutions for a better mobilisation**
  3. **How do we get there? The AgroBioHeat Project**



# What is “agrobiomass”

## Herbaceous agricultural residues

- Straw, maize residues, etc.

## Woody agricultural residues

- Prunings from fruit trees and hedgerows, plantation removal biomass

## Agro-industrial residues:

- Olive stones, olive cake, nutshells, sunflower husks, rice husk, peach kernels, etc.



1 ton of an agricultural product → > 1 ton of agricultural residues / by-products!!

## Lignocellulosic herbaceous crops

- Miscanthus, switchgrass, hemp, etc.

## Lignocellulosic woody crops (SRC)

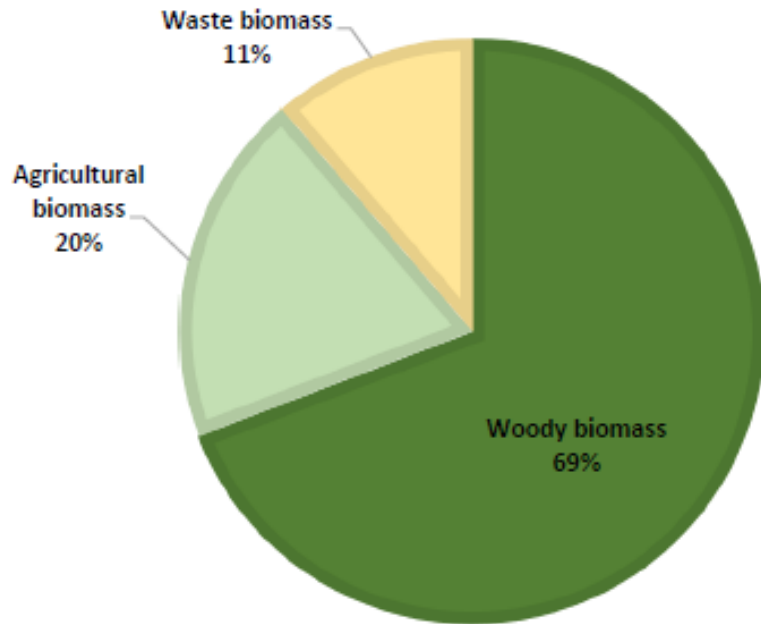
- Poplar, willow, eucalyptus, etc.

## Oilseed crops, specialty crops, etc.



Higher yields, cultivation on abandoned, marginal, or contaminated land, eco-system services, etc.

# Agrobiomass and energy crops



Mobilisation issues & untapped potential

New policies need to be developed

Rural areas – higher heating needs and risk of energy poverty (no gas grid)

## Benefits:

Reduction in the heating bill & costs of operations

Additional income through diversified activities

Solution for handling large volumes of residues



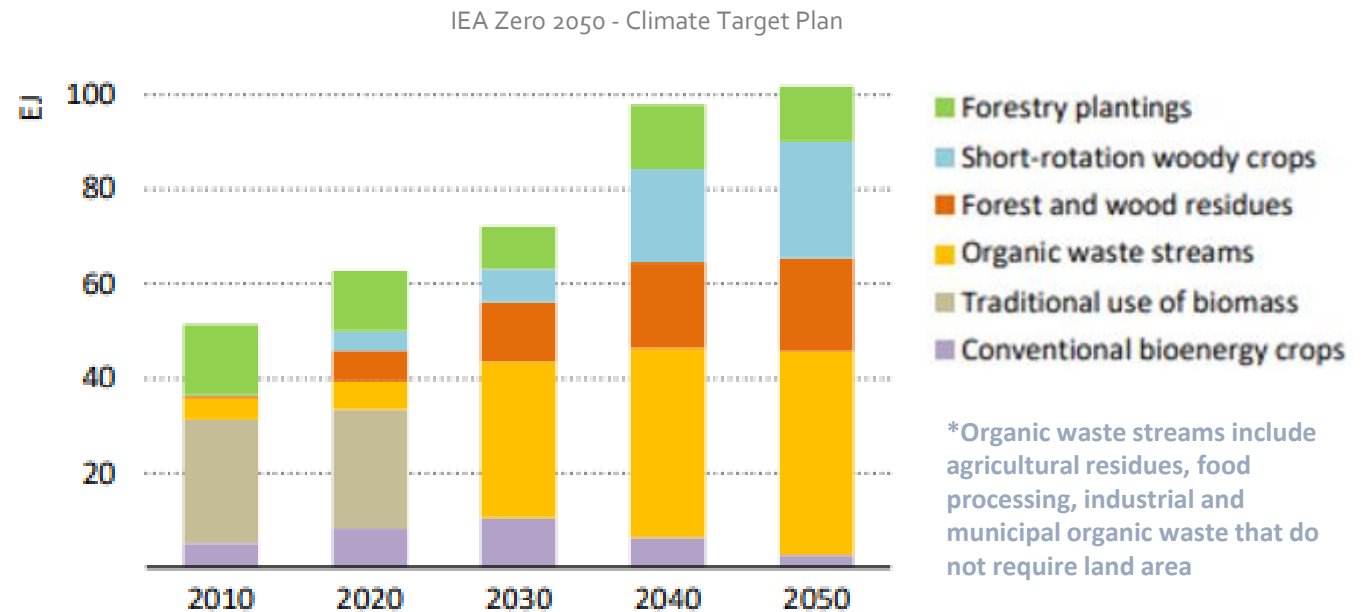
# The EU scenarios for agrobiomass

The [EU 2050 vision](#) foresees an increase in bioenergy in ALL scenarios

The potential of agrobiomass is clear in several studies such as the [IEA Roadmap](#) where bioenergy use is expected to increase by 60% between 2020-2050

## And several key policy files such as:

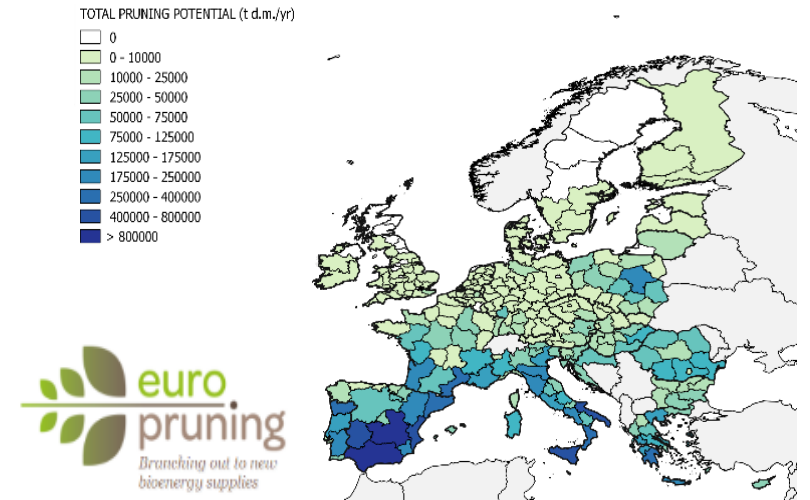
- 2030 Targets IA & the energy system integration strategy
- The new Circular Economy Action Plan & sustainable agriculture and forestry management systems
- The [post-2020 Common Agricultural Policy \(CAP\)](#)



# Agrobiomass potential in Europe

- Perennial energy crops are 0,03% of EU total area, 0,07% of agricultural land
- According to the JRC, within the period 2015-2030 abandoned land could account for 4,2 million ha (3% of total agricultural land)
- The land not fit for food production could be used for energy crops, with tremendous environmental and socio-economic benefits

**Agricultural prunings:** 12,5 Mt dry, technical potential



→ Growing role for bioeconomy and circular economy



# Vineyards in Europe

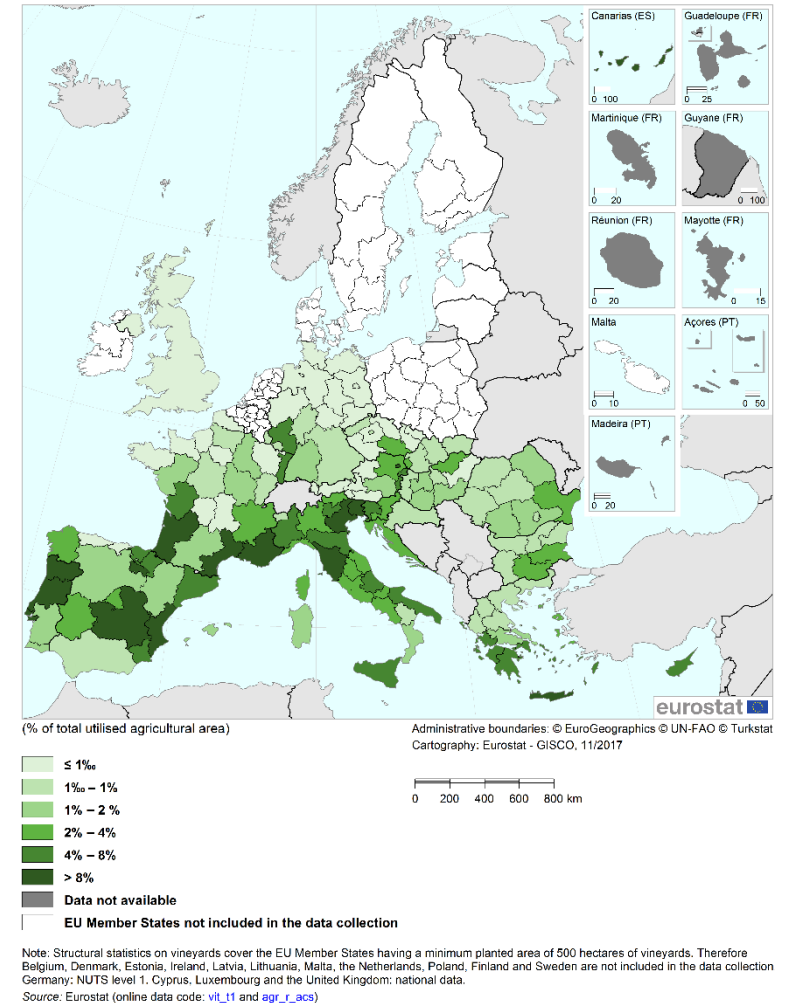
## Areas under vines in the EU-28 (EUROSTAT, 2015)

- 3,2 million hectares (45 % of world total)
- Main producers: Spain (29,1%), France (24,9%), Italy (20,1%), Portugal (6,1%), Romania (5,7%), Greece (3,2%), Germany (3,2%)
- 2,5 million agricultural holdings (EU-average 1,3 ha/holding average vineyard)
- Mostly older vineyards: <9 years: 22,2%, 10–29 years: 40,7% , >30 years: 37,1%

## Beyond the EU

- Turkey: 468 000 ha
- Moldova: 140 000 ha (highest density in the world)
- Russia: 88 000 ha
- Georgia: 48 000 ha

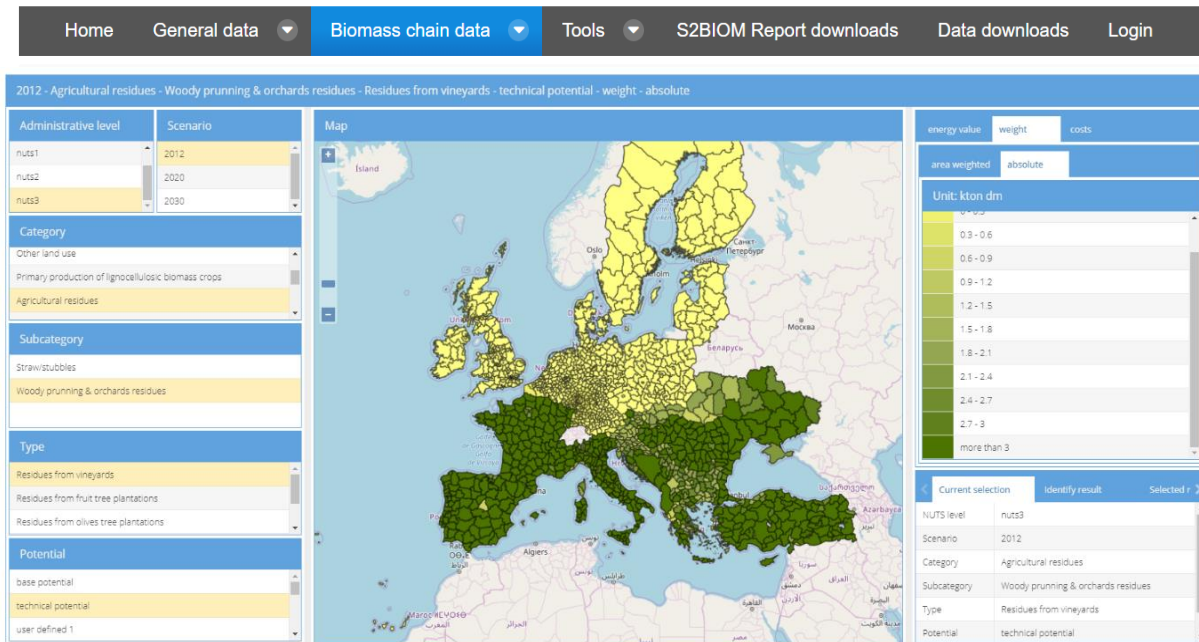
Map1: Area under vines, by NUTS 2 regions, 2015  
(% of total utilised agricultural area)



# Vineyards prunings – technical potential



Tools for biomass chains



In every dark green NUTS3 area, there are more than 3 000 tons of vineyard prunings (dry matter) technically available

Source: S2Biom project tool set

(<https://s2biom.wenr.wur.nl/web/guest/home>)

Calculation assumptions:

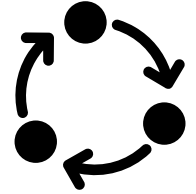
- Vineyard prunings / Moisture: 36 %w-% ar, LHV: 10.38 MJ/kg, ar
- Heating oil / LHV: 42.8 MJ/kg, Density: 0.85 kg/l, Emission factor: 73.78 tCO<sub>2</sub>/TJ

Their energetic utilisation for heat production in modern, efficient facilities heating oil corresponds to:

- **Fossil fuel substitution > 1 337 445 litres of heating oil per area**
- **Greenhouse gases avoidance > 3 590 tCO<sub>2</sub> per area**

# Challenges & Opportunities

# Agrobiomass mobilisation



## BARRIERS

DISPERSE NATURE OF BIOMASS  
MOBILISATION IS KEY FOR FURTHER DEVELOPMENT  
LACK OF ADVANCED LOGISTICS SYSTEM

- Further support agricultural productivity
- Map contaminated and abandoned land and mobilise unutilised potentials to grow dedicated energy crops
- Improve harvest logistics by stimulating the creation of clusters to share equipment and provide storage
- Incentivise local supply chains and provide public financing to support the SME's investments

## SOLUTIONS



# Quality of agrobiomass & knowledge gap



## BARRIERS

VARIABLE QUALITY  
OBSTACLES TO MARKETABILITY

RESIDUES SEEN AS WORTHLESS  
PRACTICES IMPACTING THE QUALITY

- Good practices during harvesting, transportation, other logistic steps
- Stimulate the process of developing technical standards (ISO) in order to turn lignocellulosic material into fully tradeable commodities.
- Support the introduction of industry-led quality certification
- Convert low quality material to intermediate product

## SOLUTIONS

# Value chain issues



## BARRIERS

LOW MARKET PRICES  
TIGHT PROFIT MARGINS  
COST OF HARVESTING

- Upgrade residues on farm when needed
- Economy of scale: considerable size end user (AD, biorefinery, pelleting, CHP)
- Improve public acceptance: promote the agrobiomass fuels with the end-users to build trust, promote intangible benefits
- Improve harvest logistics

## SOLUTIONS

# Benefits of agrobiomass

Socio-Economic Benefits	Environmental Benefits
INCOME DIVERSIFICATION FOR FARMERS	EMISSIONS SAVINGS
PROMOTE SOCIO-ECONOMIC DEVELOPMENT AT A LOCAL SCALE	RESOURCE EFFICIENCY
SELF-SUFFICIENCY	PHYTOREMEDIATION
TRIGGERS NEW FORMS OF AGRO-INDUSTRIAL INTEGRATION	IMPROVES SOIL QUALITY & CARBON SEQUESTRATION, WATER QUALITY AND BIODIVERSITY

# The AgroBioHeat project



# The project & its consortium

→ **Overall aim:** support rural decarbonisation through market uptake of modern, efficient, low-emissions agrobiomass heating solutions

- Horizon2020, Grant Agreement 818 369 € **Technical partners**

- European Climate, Infrastructure and Environment Executive Agency (CINEA)

- Topic: LC-SC3-RES-28-2018-2019-2020  
- Market Uptake support

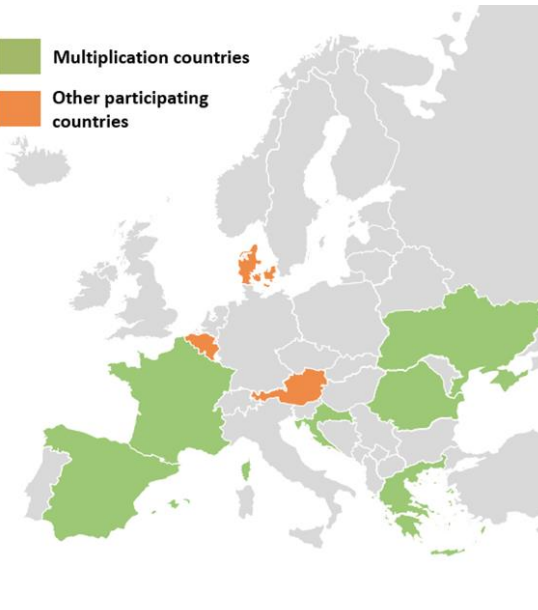
- 1st Jan 2019 – 31st Dec 2021 (extension)

- Budget /EU funding: 2 998 043,75 €

- Project Coordinator: Centre for Research and Technology Hellas (Greece)



Multiplication countries  
Other participating countries



European Association



National multipliers

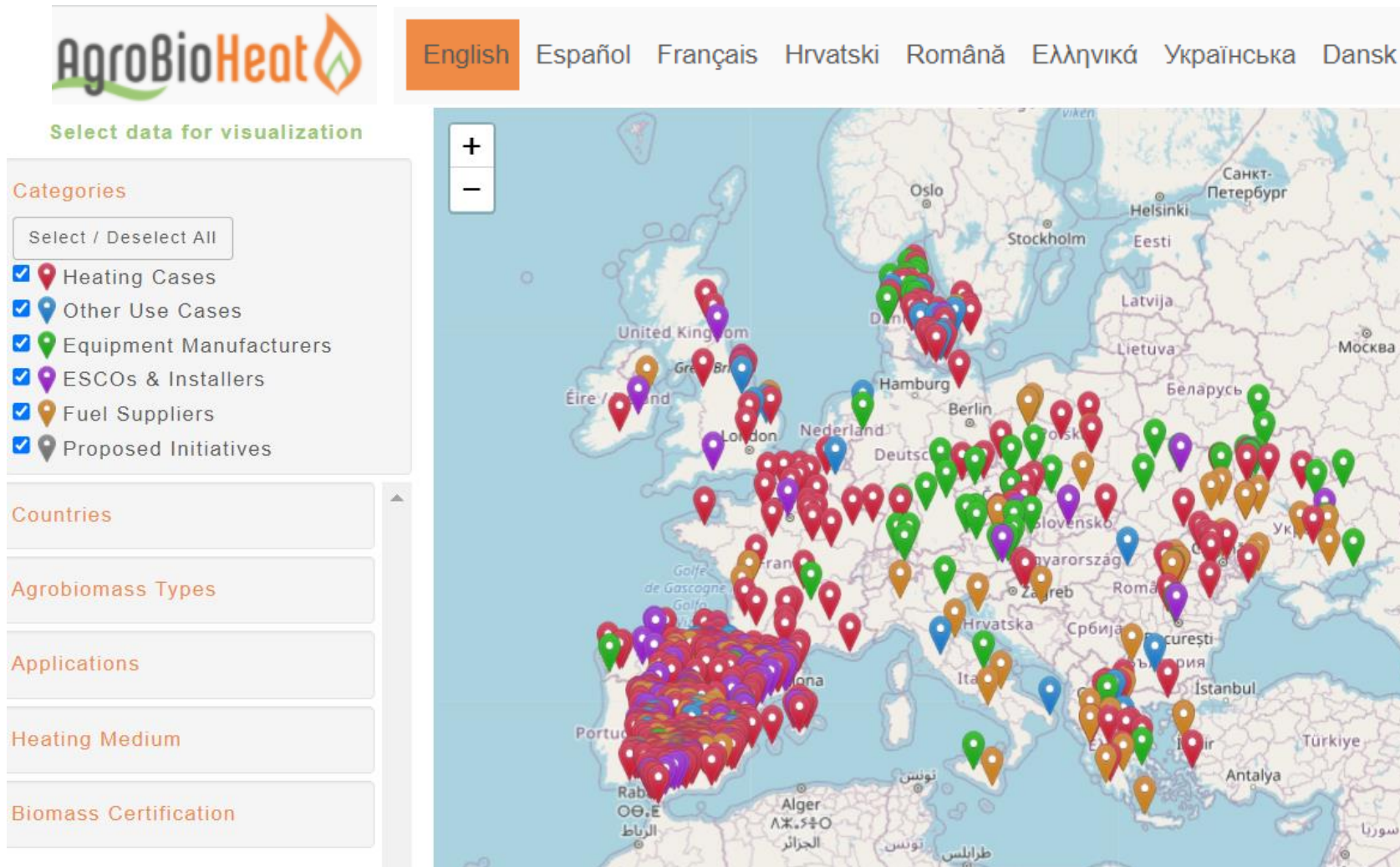


Straw & network expertise   Operator of biomass heating plants   Social sciences expertise



[www.agrobioheat.eu](http://www.agrobioheat.eu)

# The AgroBioHeat Observatory



- 680 agrobiomass heating cases (thermal output <50MW)
- 51 other cases of agrobiomass use (power, CHP, large-scale heat, etc.)
- 67 equipment manufacturers (boilers, flue gas cleaning systems, others)
- 113 ESCOs & installers
- 114 agrobiomass fuel suppliers

**Continuously updated!**

[www.agrobiomass-observatory.eu](http://www.agrobiomass-observatory.eu)



# Success story: Vilafranca del Penedès



Spain, vineyard region between Barcelona and Tarragona with 25 000 ha of vineyards

(photos from @AgroBioHeat and <http://vineyards4heat.eu/>)

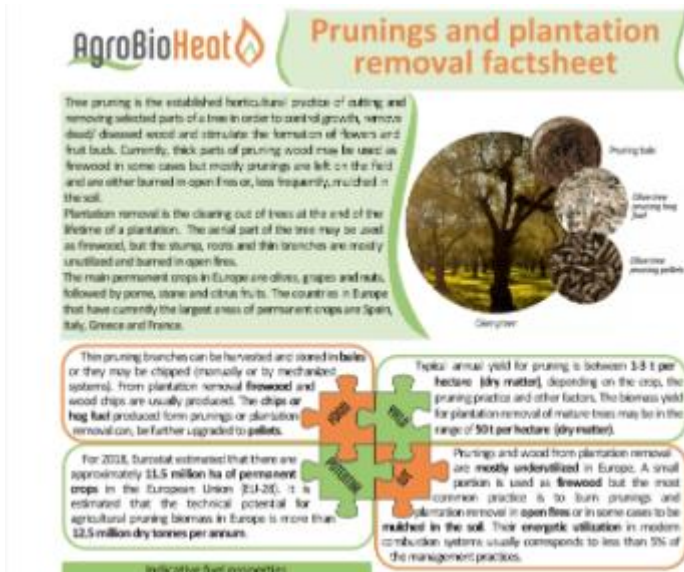


## About this initiative:

- Joint initiative of local authorities and businesses
- Wine cooperative "La Granada" collects vineyard prunings
- Heat network powered by a 500kW biomass boiler
- Fed exclusively by vineyard prunings but can adapt
- Distribution of sanitary hot water cheaper than gas

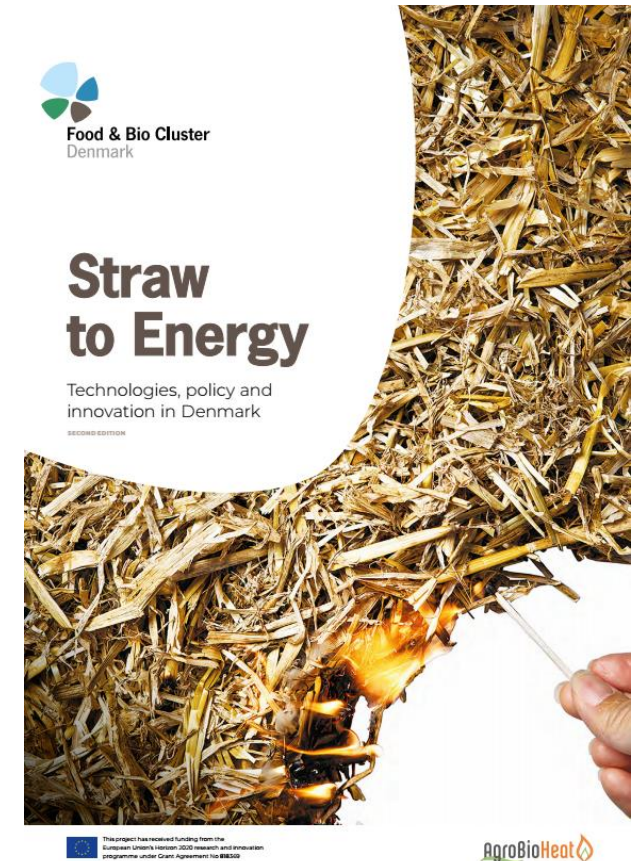
<https://www.youtube.com/watch?v=xggXPpekJHg>

# Some communications tools



AgroBioHeat factsheets  
Available for download [here](#)

Straw to Energy guide  
([AgroBioHeat](#))

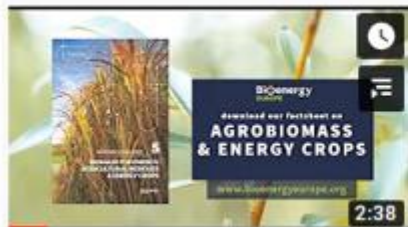


## Agricultural Biomass for Energy Crops Series: The potential of Agricultural Residues

Bioenergy Europe • 406 views • 5 months ago

Bioenergy Europe's second video of a series of four dedicated to #bioenergy feedstock coming from #agriculture, both perennial ...

[www.youtube.com/watch?v=OvGo3oYGbPI](http://www.youtube.com/watch?v=OvGo3oYGbPI)



## Agricultural Biomass for Energy Crops Series: Policy Messages

Bioenergy Europe • 264 views • 3 months ago

Bioenergy Europe's final video of a series of four dedicated to #bioenergy feedstock coming from #agriculture, both perennial ...

[www.youtube.com/watch?v=xU\\_GOY7\\_D6o&](http://www.youtube.com/watch?v=xU_GOY7_D6o&)

[Bioenergy Europe Facsheet](#)



# Bringing value to agrobiomass – Matchmaking event



- 259 participants
- 280 bilateral meetings
- Excellent feedback on relevance of meetings
- Real collaborations / partnerships materialising



- Matchmaking event
- Webinar on 27 Oct 2021
- 200 participants

New online event planned for first half of 2022 – **Stay tuned for more details!**

# Thank You!