Take-off for sustainable supply of woody biomass from agrarian pruning and plantation removal

uP_running: Success cases for mobilization of wood from agricultural prunings

SecureChain
sustainable biomass energy

SecureChain Final Conference
Brussels, 7th June 2018

Call H2020-LCE-2015-3
Coordination and support action

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CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 691748

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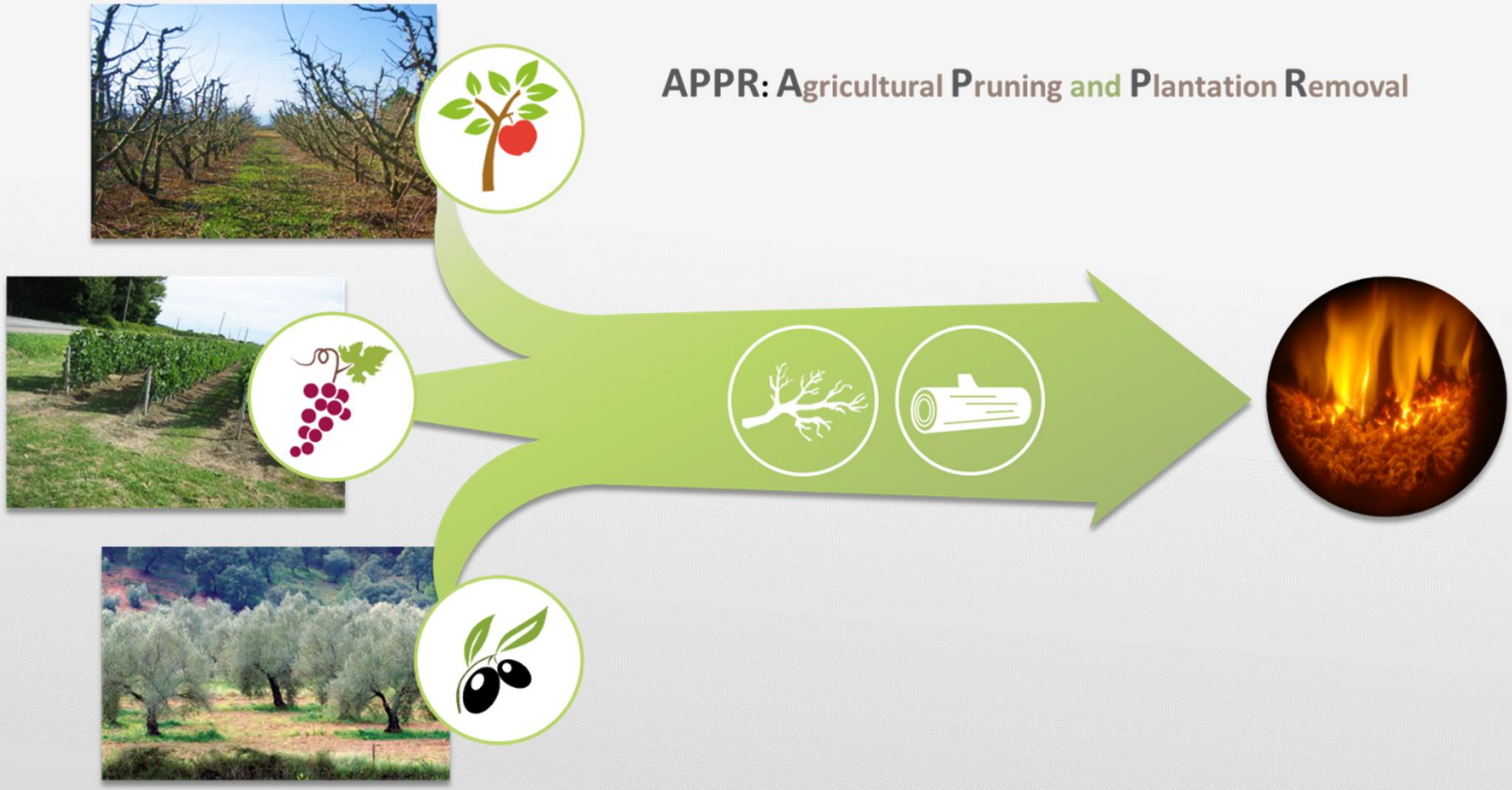
Woody biomass from permanent crops (olive groves, vineyards, fruit orchards)

…Agrarian Pruning and Plantation Removal (APPR)



The European APPR biomass potential is huge

TOTAL pruning potential

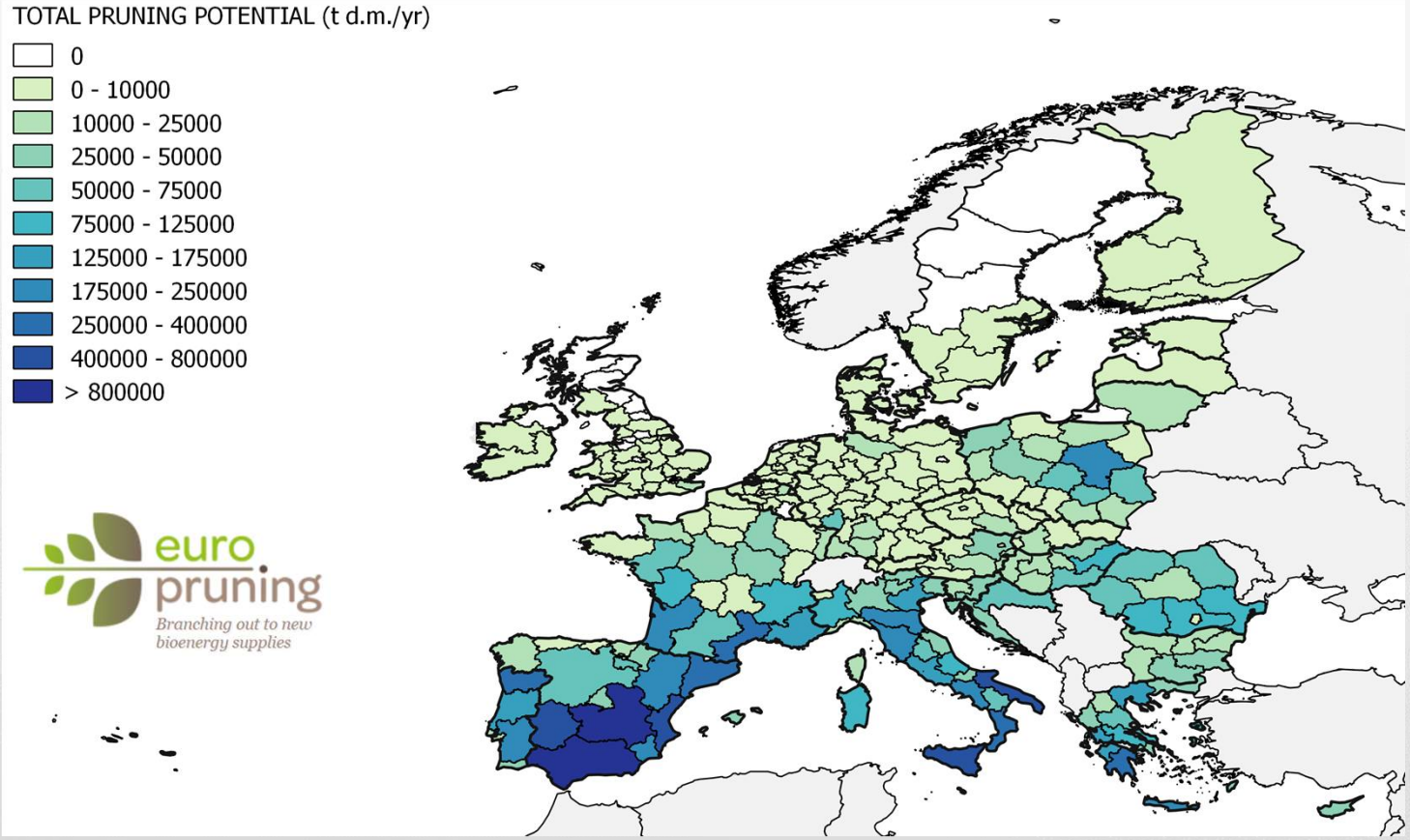
> 13 Mt (dry matter) pruning

(eq. to 26 Mt of fresh matter)

TOTAL APPR potential

> 20 Mt (dry matter)

(eq. to 40 Mt of fresh matter)



If there is a huge potential why isn't it used?

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EXISTING BARRIERS

- APPR largely spatially dispersed
- Low economic value of pruning
- Energy Policy unstable
- Lack of market driven incentives
- General scepticism of market actors
- Matter of secondary interest for society and policy makers

POTENTIAL DRIVING FORCES

- Greening the economy
- Circular economy
- Large potentials available
- Diversifying rural economies
- Improve air quality and reduce CO2 emissions
- Public initiatives exemplifying

Our mission

uP_running is a INITIATIVE to drive changes in the use of agricultural residues

uP_running project

uP_running partners

sector

Who are we?


UkrainianAgribusinessClub
SEC Biomass
BIOMASS
ServicesCOOP DE FRANCE
Union de Coopératives Agricoles
ASAJA HUESCA
circe
RESEARCH CENTRE FOR ENERGY RESOURCES AND CONSUMPTION
HPK
HRVATSKA POLJOPRIVREDNA KOMORA
CONFAGRI
Confederação Nacional das Cooperativas Agrícolas e do Crédito Agrícola de Portugal, CCRL
Università di Foggia
DAREPUGLIA
Distretto Tecnologico Agroalimentare
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INASO-PASEGES
INSTITOUTO AGROTIKIS & SYNETAIRISTIKIS OIKONOMIAS

The uP_running Observatory and APPR value chains identified

http://www.up-running-observatory.eu

Observatory map of biomass from agrarian pruning and plantation removal

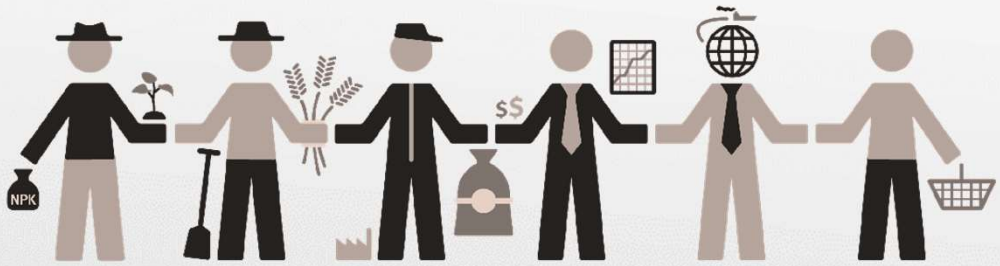
- **20 existing value chains** identified so far
  - Visualized on the uP_running Observatory using a standardized template
  - More cases to be recorded
- **5 flagship cases** studied in detail
  - At least 5 more to be selected and studied till end of project

APPR biomass mobilized per case (t/y)	# cases	Type of cases	Flagship cases
< 500	12	Domestic heating (self-consumption) or other heating applications (e.g. municipal heating, small agro-industries)	Domaine Xavier Muller (FR), Vineyards4heat (ES)
500 – 2,100	3	Heat production in larger agro-industries, co-firing fuel for biomass CHP / power plants	ITC Shabo (UA)
8,000	1	Wood chips production (exclusively from APPR)	
8,000	1	Power production (exclusively from APPR)	Fiusis (IT)
Up to 20,000	1	Large-scale pellet / chip production (exclusively from APPR)	Athisa Group / Pelets de la Mancha (ES)
> 84,000	2	Power production (APPR biomass as co-firing fuel)	

Policies, regulations, incentives

Social perception favorable

All value chain actors should obtain a benefit



Benefits

Tangible

- New incomes
- Economic savings
- Time savings, *etc.*

Intangible

- Avoid pests
- Avoid fire risks
- Reduce CO_2
- Image of sustainable business
- Differentiation from competence
- Independence from fossils, *etc.*

VINYES XCALOR

Life

AJUNTAMENT VILAFRANCA DEL PENEDÈS

- Location: Vilafranca del Penedés, Spain
- Private and Public actors join forces for the production of heat from vineyard prunings
- Initiated in 2015
- APPR biomass mobilization: 225 t/y (vineyard prunings) during the project
  - Potential can be up to 30,000 t/y
- Biomass sourcing radius: 15 km
- Total investment: 600 k€
- Job creation:
  - 4 permanent jobs in the logistics chain
- GHG emissions avoidance: 125 t of CO_2 in 2016
- **Best LIFE project award, category "Climate Action"**

Manual pruning and preparation of branches	Integrated collection with shredding	Download on truck at field side	Storage in a roofed facility	Transport to final users	On-site storage and energy conversion

Farmers — *NOU VERD* — *Vilarnau, EMAVSA*

Benefits

Tangible

- Save time and money in pruning residues management
- Get economic margin
- Diversify activities

Vilarnau:
- Lower energy cost

EMAVSA / municipal authorities:
- Lower energy cost
- Reduced municipal taxes (EMAVSA)

Intangible

- Avoid risks of fires and diseases
- Avoid pollution due to open-field burning of prunings

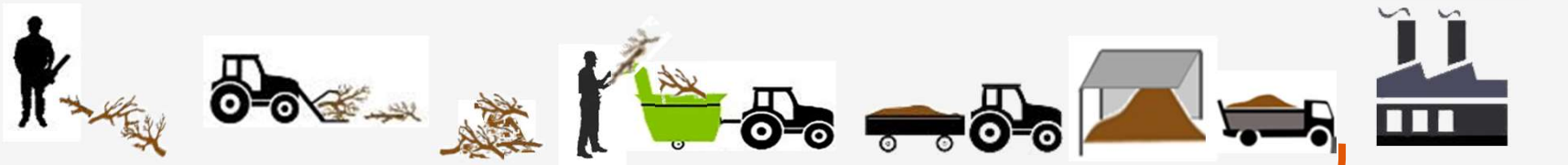
Vilarnau:
- “Greener” image of business

EMAVSA / municipal authorities:
- Improved air quality
- Promote successful utilization case of prunings
- Job creation

SINCE 1822 SHABO

- Location: Odessa region, Ukraine
- Use of vineyard prunings for heat production in winery / distillery
- First successful case of industrial APPR use in Ukraine
- Initiated in 2015
- APPR consumption: 1,000 – 1,500 t/y (vineyard prunings)
- Biomass sourcing radius: 10 km
- Total investment: Not disclosed. No public funds used
- Job creation
  - 5 permanent jobs for boiler house operation
  - 7 part time jobs for logistics and 2 part time jobs at storage facilities
- GHG emissions avoidance: ~ 1,500 tCO_{2eq}/y

Manual (mechanical pruning)	Forwarded with fork to field side	Open-air storage of pruning at field side	Manual feeding / Shredding	Transport of shredded material to central storage	Storage of dry shredded wood and delivery to ITC shabo facilities	Reception at boiler house and steam production



Agrofirm Shabo | *ITC Shabo*

Benefits

Tangible

- Save time and money in pruning residues management
- Small revenue from selling prunings to end-user
- Low cost of biomass
- Savings in respect to wood or other fossil fuels heating

Intangible

- Avoid risks of fires
- Avoid production of smoke and emissions in the area
- Good image for local authorities and population
- Diversification of energy sources
- Increased competitiveness
- Branding: “sustainability” and ”good practices”

Fiusis: power production from APPR biomass

FIUSIS
ENERGIA DAL LEGNO

- Location: Calimera, Italy (“Grecia salentina”)
- First power plant in the world (1 MWe) fueled exclusively by olive tree prunings
- Initiated in 2010
- APPR biomass consumption: 8,000 t/y (olive tree prunings)
- Sourcing radius: 10 km
- Total investment: 8 M€
- Job creation:
  - 6 permanent jobs created at the energy plant
  - 10 permanent and 5 seasonal jobs for the logistics chain
- GHG emissions avoidance: ~ 5,300 tCO_{2eq}/y

Value chain 1: for fields < 400 trees

Manual pruning and preparation (windrowing) of branches	Integrated harvesting with pick-up of branches and shredder with direct download on truck or agricultural trailer. Direct transport to power plant.	On-site storage and energy conversion

Farmers | ***Ligna (Fiusis subsidiary)*** | ***Fiusis***

Benefits

Tangible

- Save time and money in pruning management
- High feed-in tariff (280 € / MWhe gross) for electricity production when using local biomass
- Cheaper sourcing of biomass

Intangible

- Avoid risks of fires
- Avoid air pollution from uncontrolled burning of prunings
- “Greener” image of company
- Closer ties with local community / fewer objections to operation

Lessons learned:

- APPR value chains can be versatile
  - No “one-size-fits-all” model exists
  - Local conditions and peculiarities should be considered
  - Different products can be produced: heat, electricity, upgraded bioenergy carriers (chips, pellets), even bio-commodities
- Low biomass productivity is not an obstacle
  - Cases where productivity < 1 t/ha
  - Lesser effect of productivity when displacing fossil fuels for heat applications
  - Power production is more restrained by the level of the feed-in tariff
- APPR value chains are mostly local
  - Typical sourcing radius: 10 – 15 km
  - Involvement of local actors and local acceptance is a prerequisite for success

Lessons learned (continued):

- APPR value chains foster job creation and rural development
  - New, even permanent jobs, created for most models (except self-consumption)
  - Other tangible and intangible benefits also materialize on local level
- APPR value chains constantly evolve
  - Adapting to local and changing market conditions, refining business model and logistics, developing new products is key to success
- Skepticism is to be expected in early stages
  - Initial reaction tends to be negative
  - Snowball effect once benefits become apparent
- APPR utilization starts from a change in farmers' attitude and practices
  - Agreement between farmers and next-in-line actor is critical (given for free, sold for a price, or service paid)
  - Practical demonstration of feasibility of new agronomics

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Thank you very much for your attention!

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