



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

## Item 9: Take-off for sustainable supply of woody biomass from agrarian pruning and plantation removal – uP\_running project

«CDG HOS – OLIVES SECTOR »

Brussels, rue de la Loi 130

11th floor

Meeting room: A

on Monday 6 November 2017, from 09:30 to 18:00

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

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# Today at CDG Olive

- Who?



Daniel García Galindo

uP\_running Project coordinator.

Key person in other FP7 and H2020 projects (EuroPruning, S2Biom, SUCELLOG, greenGain, SteamBio, AGROinLOG)



- Today's objective

- Transfer to CDG OLIVE stakeholders our vision
- Convey our main messages
- Clarify / Debate pros / cons of APPR agro-biomass
- Invite to approach our initiative

# Agenda

1. uP\_running
2. Olive woody biomass and APPR opportunity for Europe
3. Key messages.
4. Follow, join, take advantage of uP\_running



# What is uP\_running?

**Take-off for sustainable supply of woody biomass from agrarian pruning and plantation removal – uP\_running project**

**H2020 project:**



**Contract: 691748**

**Duration: April 2016- June 2019**

**Action type: CSA**



# uP\_running: Woody biomass from ... ...agrarian pruning and plantation removal (APPR)



**APPR: Agricultural Pruning and Plantation Removal**





# uP\_running: Woody biomass from ... ...agrarian pruning and plantation removal (APPR)

- Similar energy than forestry wood
- More irregular, usual higher ash content

As good as fuel as forest woodchips ...



≈



$LHV_{db} = 17 - 18 \text{ MJ/kg} \approx LHV_{db} = 18 \text{ MJ/kg}$

*LHV<sub>db</sub>: low heating value in dry basis*





# Who are we?

The map shows the following organizations and their locations:

- Services COP DE FRANCE** (Union de Coopératives Agricoles) - France
- ASAJA HUESCA** - Spain
- circE** (RESEARCH CENTRE FOR ENERGY RESOURCES AND CONSUMPTION) - Spain
- Ukrainian Agribusiness Club** - Ukraine
- SEC Biomass** (BIOMASS) - Ukraine
- HPK** (HRVATSKA POLJOPRIVREDNA KOMORA) - Croatia
- CERTH** (CENTRE FOR RESEARCH & TECHNOLOGY HELLAS) - Greece
- INASO-PASEGES** (INSTITUTO AGROTIKIS & SYNETAIRISTIKIS OIKONOMIAS) - Greece
- Università di Foggia** - Italy
- DAREPUGLIA** (Distretto Tecnologico Agroalimentare) - Italy
- CONFAGRI** (Confederação Nacional das Cooperativas Agrícolas e do Crédito Agrícola de Portugal, CCRAL) - Portugal



## Our mission

Actually... uP\_running is an INITIATIVE to drive changes in the use of agricultural residues

**uP\_running  
project**

**sector**

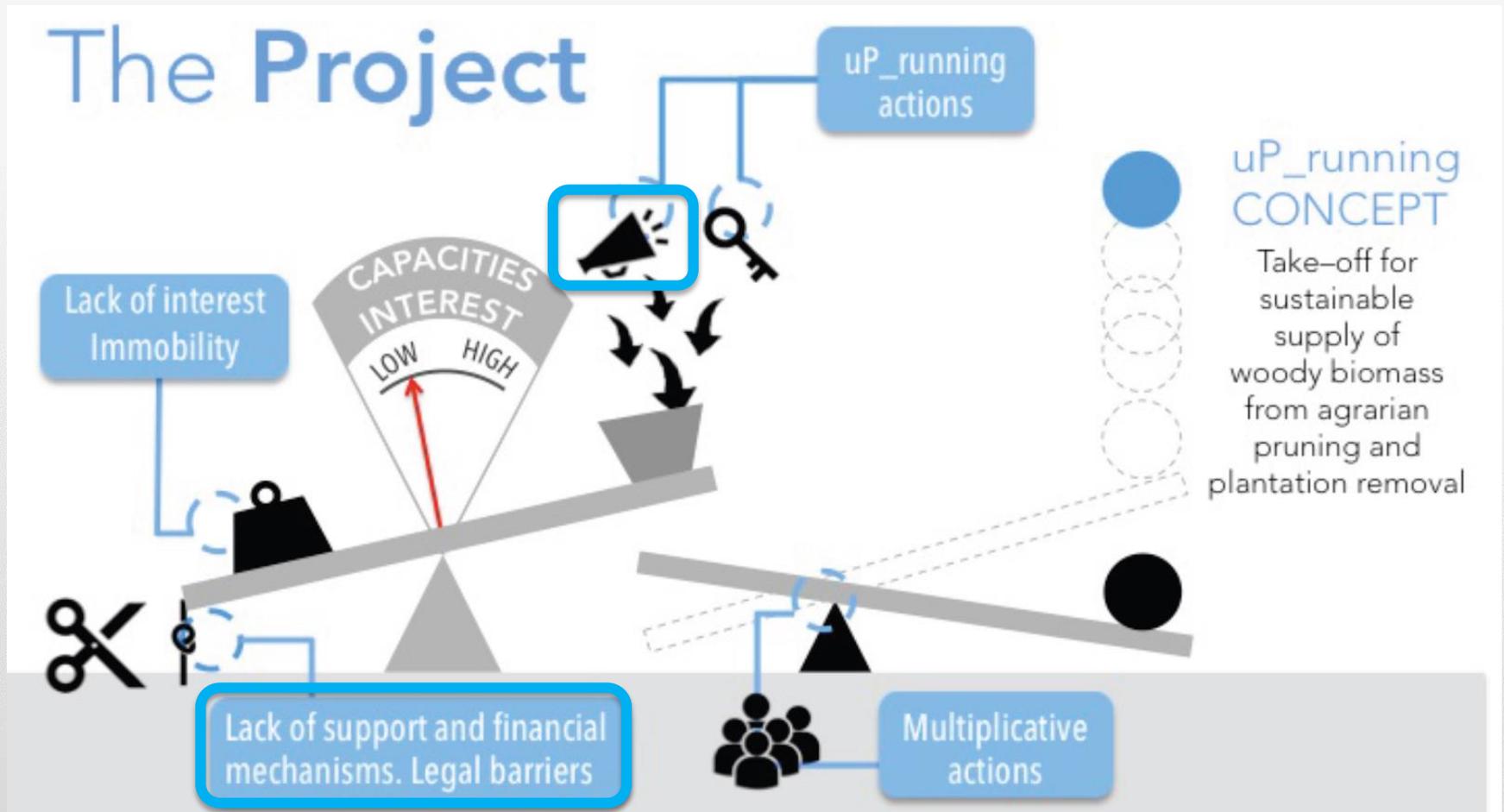


**uP\_running  
partners**



# uP\_running: trying to make the opportunity real

Why today at CDG Olive?

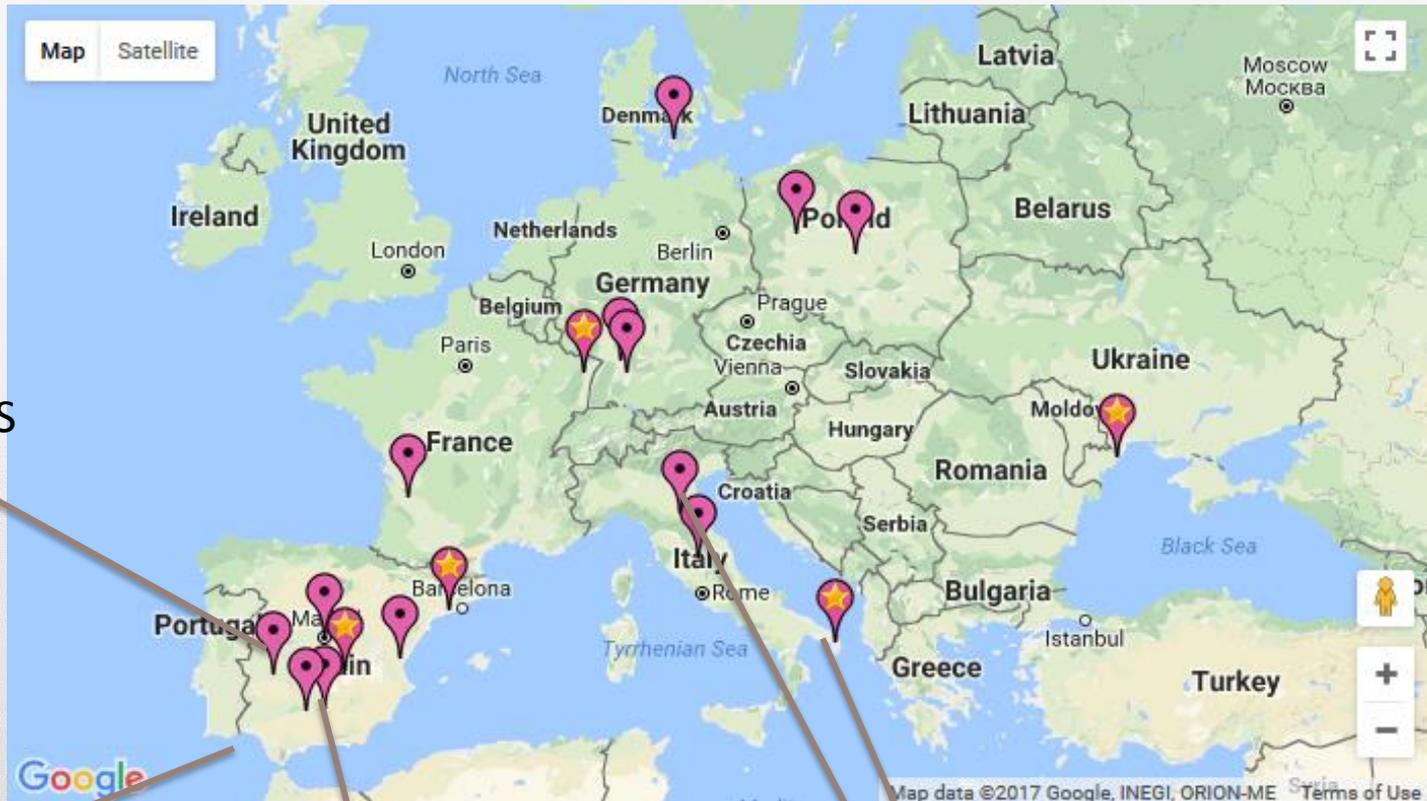


## 2. Olive woody biomass and APPR opportunity for Europe



# Existing value chains

- Biomass from Pruning in practice. Several examples of Olive wood

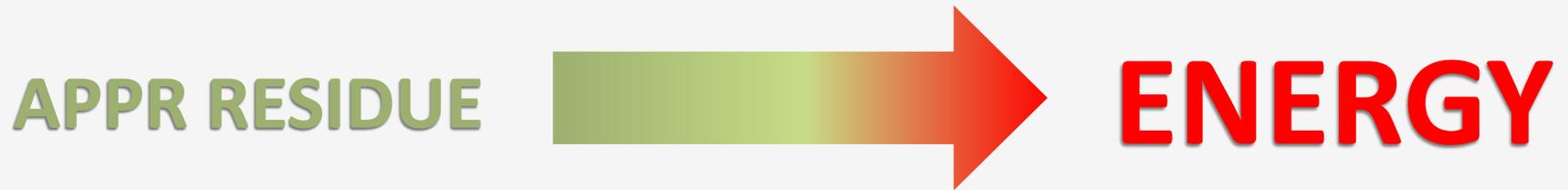


MIAJADAS

ENCE  
(recently started)

El tejar  
Sacyr industrial

Fiusis  
Riolo terme



Any value chain requires all participants get a **BENEFIT**. Then it may work

*Farmer*



**ECONOMIC**

- Sells wood
  - Reduce pruning management cost
  - Reduce gasoil
- NON ECONOMIC**
- Saves time
  - Avoids bothering operations
  - Avoids open-fire permits



*Trader / service company*



**ECONOMIC**

- Obtain a margin of benefit



**NON ECONOMIC**

- Diversify their activity
- Possibility of integrated contract (pruning + collection)

*Transporter*



**ECONOMIC**

- Obtain contracts

**NON ECONOMIC**

- Diversify their activity
- Possibility of integrated contract (fruit + pruning wood)



*Consumer*



**ECONOMIC**

- Biomass at lower price

**NON ECONOMIC**

- Diversify the energy resources
- Increase competitiveness





# Example of case: the Fiusis plant [IT]

*Source: uP\_running D6.3 report*

Fiusis at a glance	
Location	Calimera, Italy
Type of APPR involved	Prunings
Crop species used	Olives
Year of initiation	2010
Volume of APPR mobilized	8,000 t/y
Surface area with permanent crops mobilized	2,400 – 2,700 ha in total (800 - 900 ha per year due to pruning frequency)
Maximum radius of operation	10 km
Main product	Electricity production from APPR
CO <sub>2</sub> emissions avoided <sup>1</sup>	5,359 tCO <sub>2eq</sub> per year
Number of jobs created	30 (permanent)
Total level of investment	8 M€

Value Chain Actor	Tangible benefits	Intangible benefits
Farmers	Save time and money in pruning management	Avoid risks of fires Avoid air pollution from uncontrolled burning of prunings
Fiusis power plant & Ligna subsidiary	Higher feed-in tariff for electricity production by using local biomass Cheaper sourcing of biomass	“Greener” image of company Closer ties with local community / fewer objections to operation



# Example of case: the Fiusis plant [IT]

Source: uP\_running D6.3 report

Value chain 1: for fields < 400 trees



Local burning decreased 70% respect previous situation!!!



Storage under cover

Fiusis power plant





# About established value chains

- Example of leaflets for farmers.
- Sacyr Industrial [ES] mobilises about 100.000 t/yr olive pruning

**Valoriza Energía**  
Operación y Mantenimiento

**BIOMASAS DE PUENTE GENIL, S.L (9,7 MW)**  
Ctra. Puente Genil-Santaella (A-379), Km. 25  
14500 Puente Genil (Córdoba)

**BIOELECTRICA DE LINARES, S.L (15 MW)**  
Ctra. Nacional 322, km. 126  
23700 Linares (Jaén)

**Valoriza Energía**  
Operación y Mantenimiento

**AGRICULTOR,  
AHORRE 30-40 €/ha  
DESTINANDO SU PODA DE OLIVAR A  
BIOMASA CON FINES ENERGÉTICOS**

Central de compras: 957 028202 / 616 810 454  
Delegación Linares: 616 584 744

Farmer:  
Save 30-40 €/ha  
by providing your  
pruning Wood  
for energy



# Type of value chains

## Self consumption

- Farmer or cooperative use for heating (domestic, farm, agroindustry)

## Waste management / environmental action

- Municipal brigades
- Public-private joint actions
- Service companies having to find destiny for the residue

## Demand driven / market orientated

- existing / new facilities.
- pellets / woodchips for generic market

# Get to know more cases...



At observatory: <http://www.up-running-observatory.eu/en/>

In our flagship reports at: [www.up-running.eu](http://www.up-running.eu)

- 232 data points (t/ha) from previous research
- 105 data gathered from field by uP\_running
- 15 mechanical experiences
- 18 existing value chain



# Few factors making APPR value chain possible?

1-3 t/ha  
0 €/t ??

40 €/t



## Lessons learned

Not always a by-product for sale, but an opportunity for farmers to save time and money

**Intangible values can play a role!**

It is crucial the mutual understanding and dialogue between farmer and next stakeholder in the chain.

Difficulties to penetrate market. Not compatible with regular facilities.



# What else shall cause prompt changes towards extended use of APPR biomass?:

- **MARKET:**

- Petrol barrel Price
- Biomass Price and demand
- Public sector leading the change (e.g. biomass municipal heating)



- **Policy (agriculture)**

- Incentive /advantages for best practices in agro-residues management
- Obligation to withdraw APPR residues
- CAP – greening (APPR for biomass as good practice)

- **Policy (energy & environment)**

- Support to renewable power or heat
- Public procurement (e.g.: renewable energies in public buildings)
- Support by recognizing the positive role of agro-residues (e.g. in Climate & Energy policies, or in LULUCF regulations)



# Opportunity... Big potential

## OLIVE pruning potential

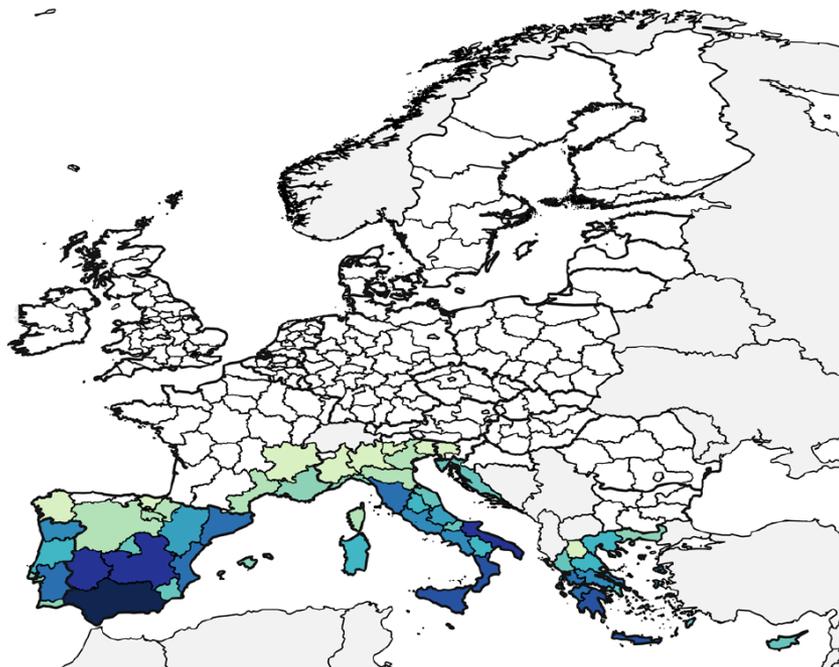
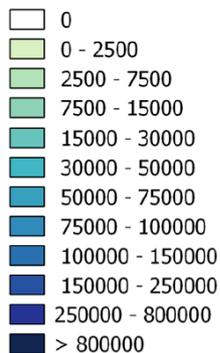
> 5.5 Mt (dry matter) pruning  
*(eq. to 11 Mt of fresh matter)*



## OLIVE APPR potential

> 8 Mt (dry matter)  
*(eq. to 16 Mt of f.m.)*

OLIVE PRUNING POTENTIAL (t d.m./yr)



*Source:  
EuroPruning  
D8.1 report*

## MESSAGE:

The olive potentials in Spain could cover heat demand of circa 6 Million persons



# Opportunity... Big potential

TOTAL pruning potential

> 13 Mt dry matter

Very small use <10%

*Source: EuroPruning, report D8.1*

TOTAL APPR potential

*(uP\_running estimation)*



~ 20 Mton / year > 7 Mt of oil equivalent  
> 45 Bn oil barrels

	Fruit	Vineyards	Nuts	Citrus	Olive	TOTAL
AT	27,428	49,080	0	0	0	76,509
BE	34,899	0	0	0	0	34,899
BG	81,776	55,181	7,869	0	0	144,825
CY	9,629	9,062	2,978	11,900	16,373	49,941
CZ	36,307	15,058	0	0	0	51,365
DE	110,917	102,120	354	0	0	213,391
DK	3,261	0	5	0	0	3,266
EE	1,800	0	0	0	0	1,800
EL	177,701	106,975	22,502	76,227	932,835	1,316,240
ES	478,130	940,455	329,151	545,869	2,749,597	5,043,203
FI	1,110	0	0	0	0	1,110
FR	346,063	879,061	27,966	13,600	20,933	1,287,624
HR	54,945	33,484	6,526	2,495	20,351	117,802
HU	187,547	63,177	6,295	0	0	257,019
IE	945	0	0	0	0	945
IT	557,845	789,241	128,705	223,519	1,434,038	3,133,348
LT	20,621	0	74	0	0	20,695
LU	208	1,337	0	0	0	1,545
LV	9,679	0	0	0	0	9,679
MT	951	932	0	415	201	2,499
NL	30,808	63	12	0	0	30,884
PL	556,495	284	25,551	0	0	582,330
PT	84,853	199,513	76,276	27,805	294,292	682,739
RO	336,424	169,933	1,628	0	0	507,985
SE	2,844	0	0	0	0	2,844
SI	19,931	17,396	567	0	994	38,888
SK	15,275	11,583	177	0	0	27,035
UK	34,917	1,014	0	0	0	35,931
<b>TOTAL</b>	<b>3,223,310</b>	<b>3,444,951</b>	<b>636,636</b>	<b>901,830</b>	<b>5,469,614</b>	<b>13,676,341</b>



## Opportunity... Agronomics with residues

- The use of APPR biomass can:
  - Drive a change towards more sustainable agricultural practices
  - Provide an alternative to current APPR residues disposal / treatment
  - Reduce farmers costs / concerns
  - Reduce the risks of pest and diseases propagation

## Opportunity... In line with Eu policies

- As presented next in the final messages

# 3. Key messages.



## LCA of ENERGY USE is QUITE POSITIVE

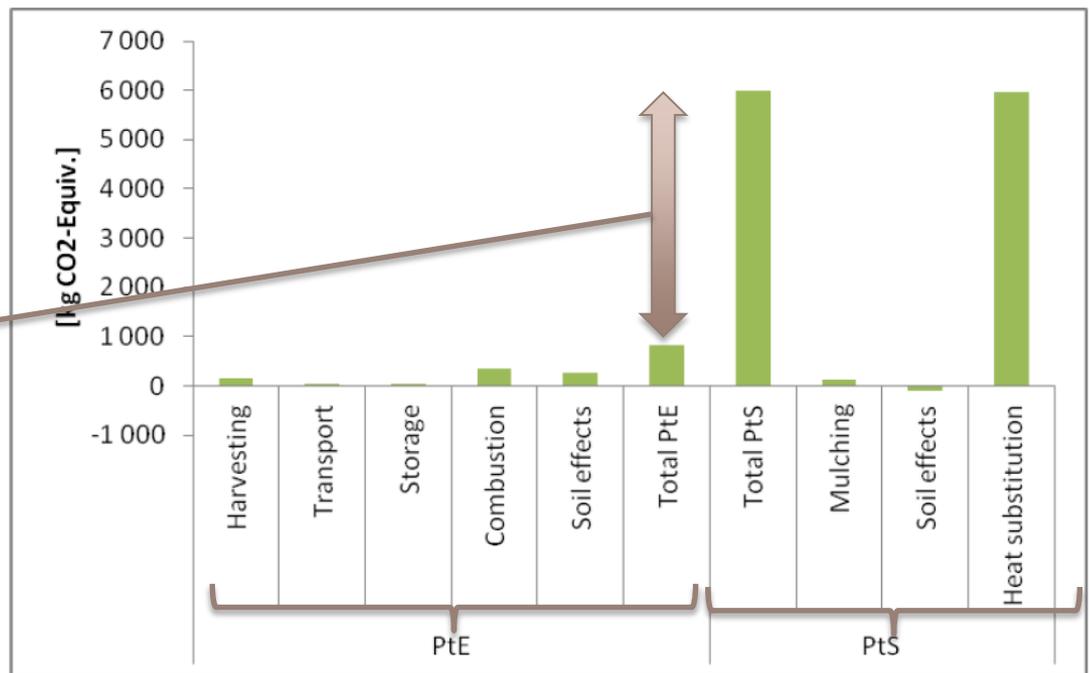
The Life cycle  
assessment of  
Pruning to Energy is  
better than the use as  
mulching

LCA olive pruning.  
Energy use improves  
climate change  
impact in factor  
1 to 6

## Details

- APPR Wood contains few nutrients.
- Mulching produces also emissions, and only small Carbon ends-up on the soil
- Important fact: replacement of fossil fuel.

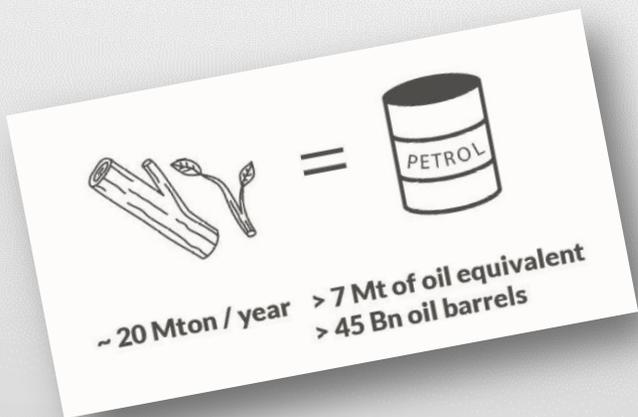
Source: EuroPruning D8.1 report





## APPR HIGH POTENTIAL, COMPATIBLE WITH SOIL SUSTAINABILITY

The sustainable potential of biomass coming from Europe is largely not used or under-utilized.



### Details

- There is a real potential to reduce GHG emissions and achieve COP21 targets
- This should be fully recognized within the frame of the EU Energy policy, Agriculture & Rural Development, Research & Innovation, Environment, etc.
- Maintaining grass cover is more effective in increasing the Soil Organic Carbon (SOC) in perennial plantations than APPR biomass integration in the soil (Details: Europruning D7.3, D8.1; S2biom D3.6)
- No mechanical work on the plantation soil is in line with agriculture of conservation.



## AVOIDING ENVIRONMENTAL RISKS

Gathering APPR biomass reduces environmental risks (fires, pests and diseases propagation)

### Details

- In Mediterranean countries an important part of forest fires start from agricultural practices.
- The dead pieces of APPR wood are a vector of expansion of fungal diseases, and for pests nesting, thus affecting plantation soundness
- The integration of APPR residues into the soil may lead to negative effects. APPR biomass C/N ratio is too high, causing temporary Nitrogen sequestration:
  - it limits the production of humus,
  - and requests farmers applying additional amounts of ready available nitrogen (more costs an chemicals)



## MULTIFUNCTIONAL ROLE OF AGRICULTURE

Bioenergy from APPR biomass is strictly enclosed within the multifunctional scheme of agriculture

### Details

- Multifunctionality: New job creation, allows income diversification, improves energy security, can contribute to circular economy, and reduce the chances of land abandonment
- Bioenergy should be considered a powerful factor in leverage rural development and in the creation of a territorial value chain.
- Specially interesting in local and self consumption schemes (farms and agro-cooperatives)



## LOW AIR POLLUTION

The energy use of biomass does not cause air pollution if modern and technological advanced energy plants are used

### Details

- An important part of the APPR biomass could go for modern heating in rural communities (farms, households, public buildings, district heating)
- Need of modernizing very old energy plants, farm boilers and rural stoves in the countryside, towards clean and modern and advanced plants.

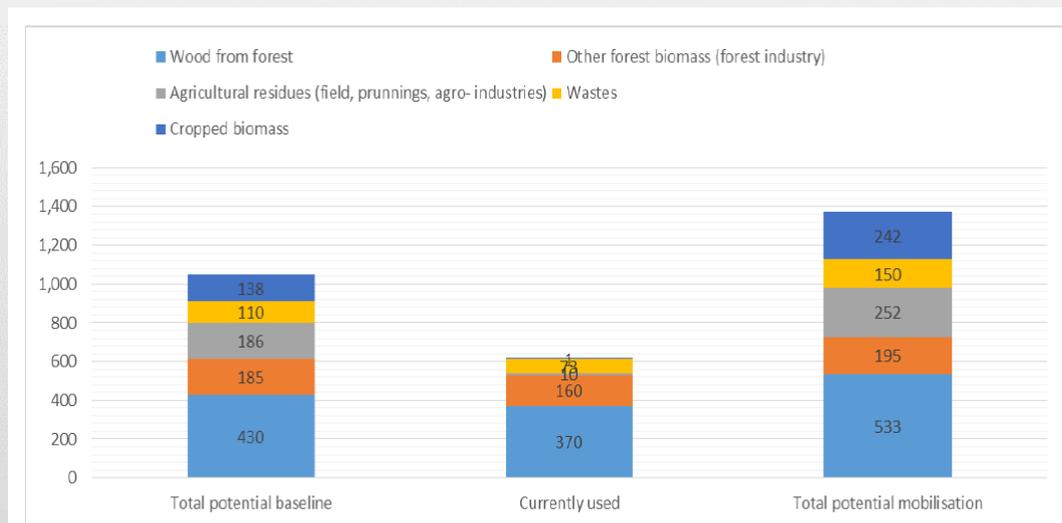


## IN LINE WITH BIOECONOMY

EU increased need for bioenergy requires a proactive policy in developing the European potential of biomass for energy.

### Details

- Energy policies should include incentives to be addressed to energy residues and by-products from agriculture, on condition that this biomass is sustainably removed from the fields (sustainability criteria respected).
- 1 billion tons necessary to sustain bioeconomy in Europe. 20 to 30 Mt could come from APPR biomass (S2Biom project)





## IN LINE WITH CIRCULAR ECONOMY

Circular economy  
and rural  
development are  
favored by local  
biomass  
consumption

### Details

- An appropriate incentive policy should still support the generation of biomass electricity from CHP technologies in small size energy plants (< 500 kW ???).
- A specific credit could be recognized to local biomass, which requires new traceability systems,
- Local consumption improves GHG balance.

# 4. Follow, join, take advantage of uP\_running



## Participating with us:

- Getting benefited by uP\_running
  - You can participate in our EU expert committee
  - We can provide policy analysis and positions according to the project results
  - Get involved in uP\_running policy workshop in the European parliament (May 2018)
  - We can provide positive examples, costs, technologies, knowledge transfer...
  - Participate in our online channel to know more



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Thank you very much for your attention!

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