



Workshop on
"Best practices in integrating primary production in the BIOECONOMY value chains and boosting the development of the BIOECONOMY in rural areas"



SUSTAINABLE VALUE CHAINS BASED ON WOODY BIOMASS FROM **A**GRARIAN **P**RUNING AND **P**LANTATION **R**EMOVAL (APPR)

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Huge potential of agro-residues in Europe

- More than **121 Mt of agro-residues** (dry matter) generated annually in Europe¹: mainly straw, but also stalks, litter and prunings.
- On Jan. 2018, EU parliament requested an increase in the weight of Renewable targets, and **considers agro-residues to be utilized for energy**².

In few words, agro-residues utilization is a straightforward strategy for:

- Diversifying the activity of the primary sector
- Creating value in rural areas
- Contributing to European strategies for climate change, rural development and bioeconomy



¹ European Environment Agency (EEA), “The circular economy and the bioeconomy – Partners in sustainability”, 08/2018.

² European Parliament, amendments adopted on the proposal for Directive on the promotion of the use of energy from renewable sources.

Agrarian **P**runing and **P**lantation **R**emoval (**APPR**)

- European potential of wood from APPR is impressive (> **20 Mt/y** dry matter)
- But the current situation is of stagnation and general scepticism:
 - Producers generally regard pruning as a waste, not a resource
 - Final consumers believe APPR wood is a low quality fuel with un-guaranteed sourcing



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



Objective and main activities

uP_running project aims to unlock the EU strong potential of APPR wood and promote its sustainable use as energy feedstock



Support entrepreneurs
and implement new value
chains



Transfer knowledge
and create capacities
for consultants



Elaborate action
plans and policy
recommendations



Who we are?

- 11 **PARTNERS** (from 7 countries)
- 7 **ADHERENTS**



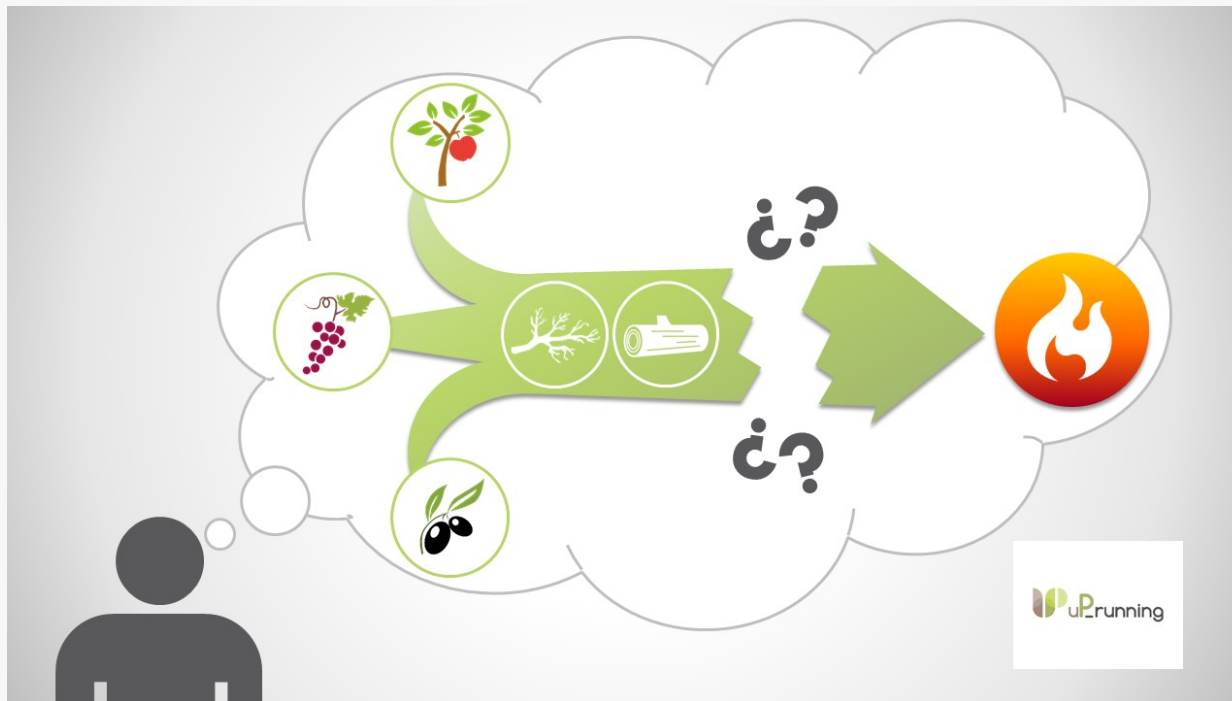
- The consortium exemplifies the collaboration needed between the **AGRICULTURE** and the **BIOMASS** sectors

Questions for today

Can the wood from APPR be used as biomass?

Which types of value chains?

Which roles for primary producers?



APPR is basically wood biomass but...

Pros	Cons
Energy content similar to forestry wood (dry basis)	Territorial dispersion
Produced during agronomic operations	Low productivity (1-10 t/ha)
Capacity to be utilized locally in rural areas	Not exactly chipped but rather shredded
No effect on forestry ecosystems	Residue in hands of multiple owners

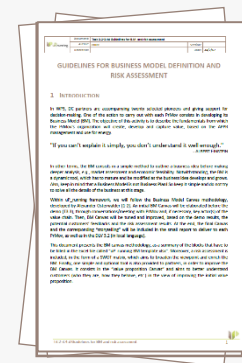
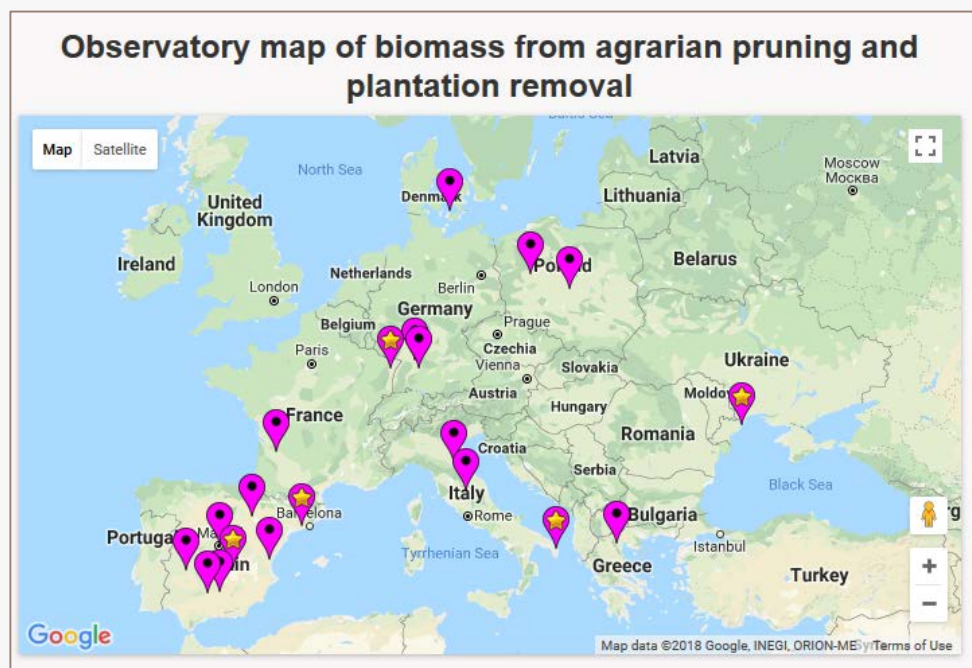
- Significant impact of collection and harvesting practices on the APPR biomass quality
- The dialogue among all the actors of the value chain is crucial





APPR-to-energy is a reality

- More than 20 existing value chains in Europe detected by uP_running and EuroPruning projects. Many others of small size existing but not documented.
- 5 flagship cases studied in detail and 6 other are under review.



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



Main business models

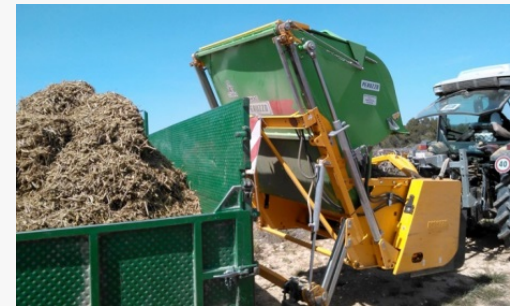
1. Self-consumption in agro-industries and farms (< 500 t/y)

- Majority of the cases detected
- Direct shift from fossil to a renewable and local fuel
- High payback period for new equipment. Aggregation/Collaboration between primary producers is needed.



2. Consumption at local facilities (500-2,000 t/y)

- Examples: initiatives promoted by local authorities
- Prerequisites: involvement of local actors & local acceptance
- Primary producers: receive no compensation for APPR (€/t). The incentive for joining is avoiding disposal costs.



3. Energy use in CHP or power plants (> 2,000 t/y)

- Exclusively APPR or as part of the fuel mix
- Large plants interested in diversifying biomass suppliers
- Complex logistics, with a high amount of actors interacting
- Restrained by the level of the feed-in tariff





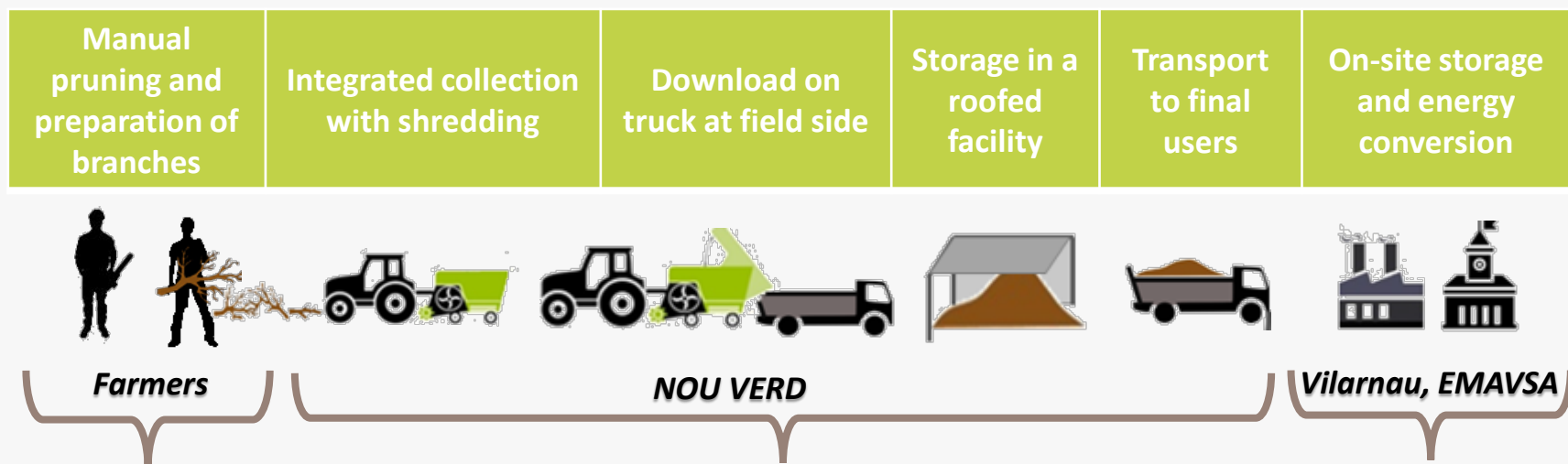
Value chains based on APPR biomass

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- Location: Vilafranca del Penedès, Spain
- Private - Public Partnership 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 CO₂ in 2016
- **Best LIFE project award, category “Climate Action”**





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)

Vilarnau:

- “Greener” image of business

EMAVSA / municipal authorities:

- Improved air quality
- Promote successful utilization case of prunings
- Job creation

Intangible

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



- 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
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

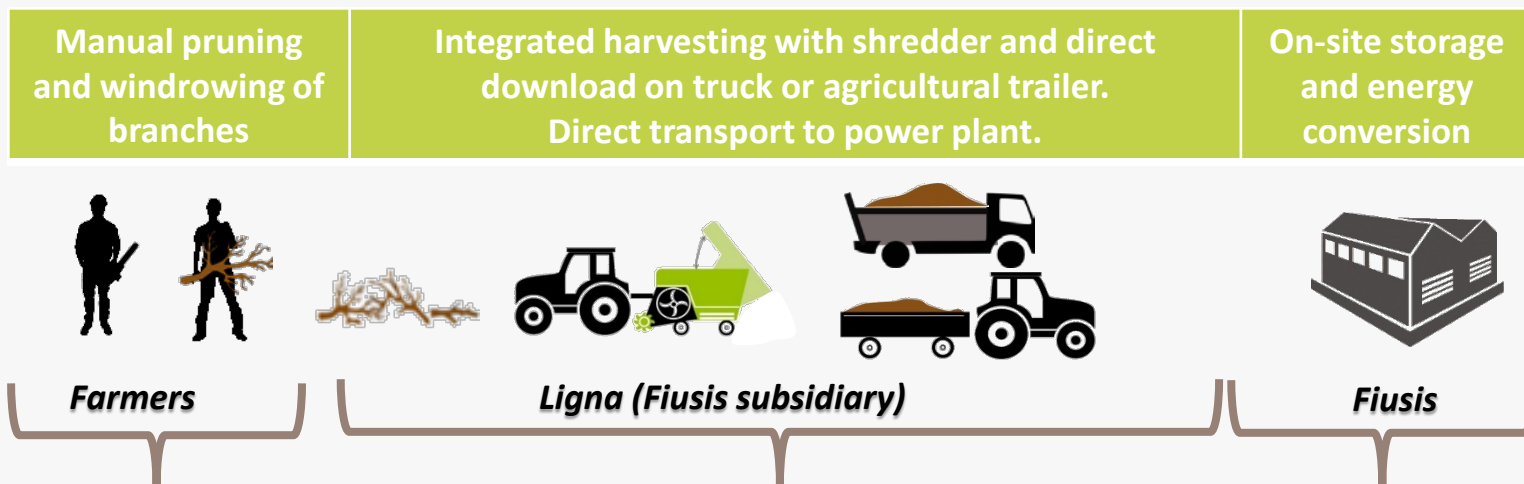




Value chains based on APPR biomass

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Value chain 1: for fields < 400 trees



Benefits

Tangible

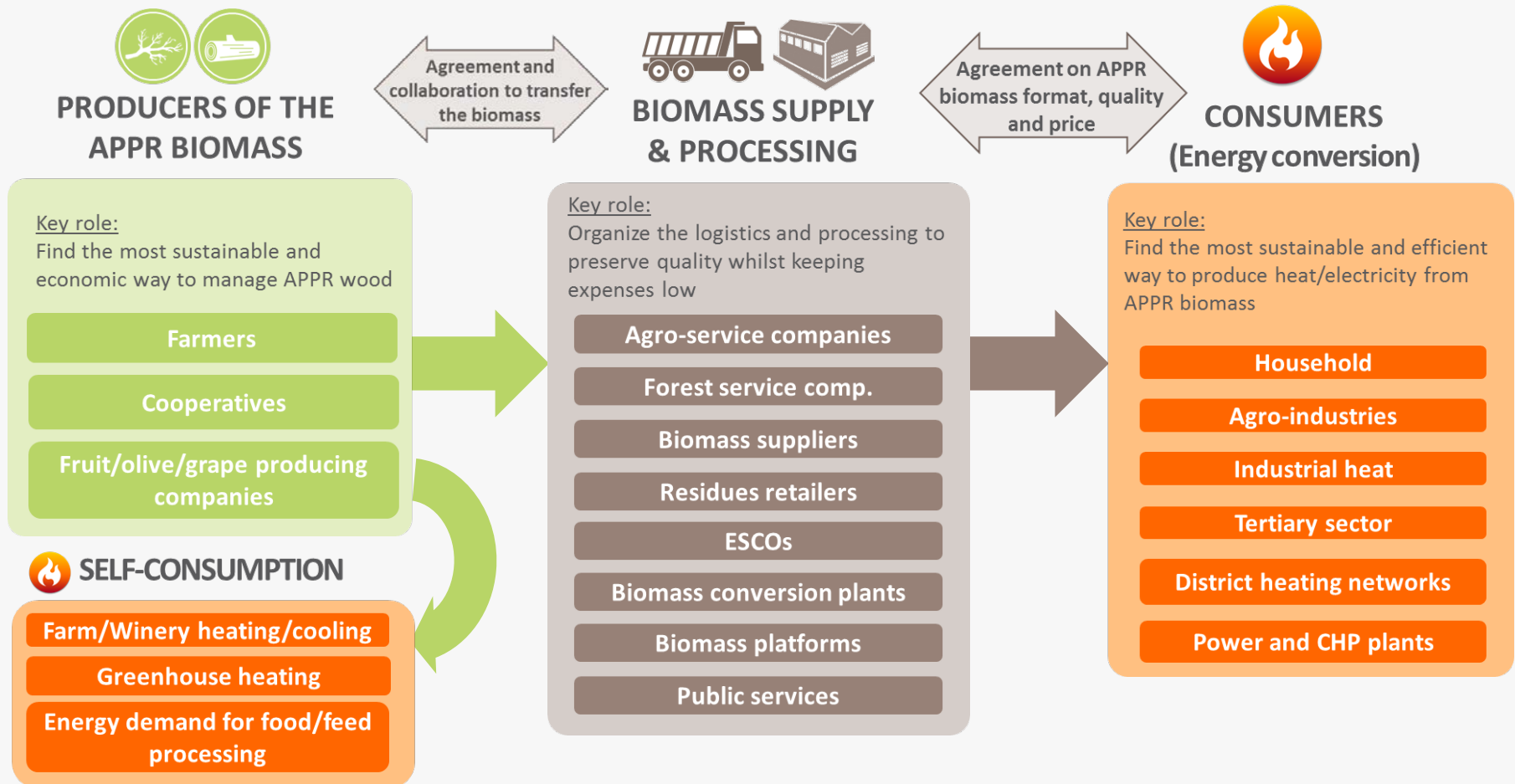
- Save time and money in pruning management
- High feed-in tariff (280 € / MWhe gross) for electricity production when using local biomass
- Cheaper sourcing of biomass

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



Types of actors, interrelations and main roles



- Farmers and cooperatives may act as producers, suppliers, logistic managers and consumers.



To succeed, efforts needed in 3 main directions

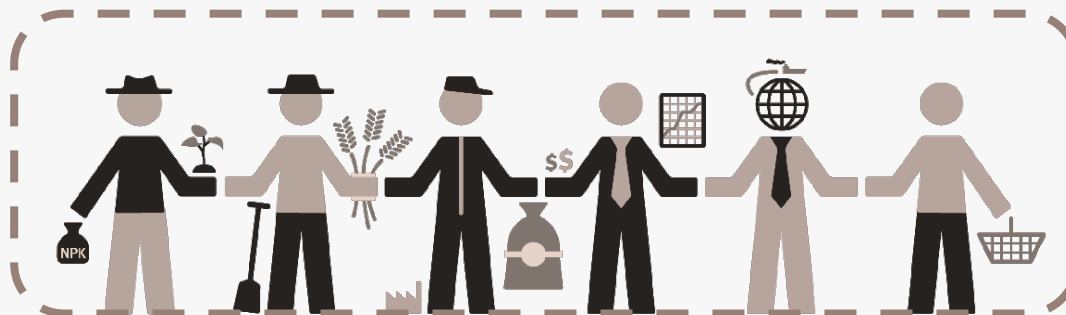
Policies, regulations,
incentives



Social perception favorable



All value chain actors should obtain a benefit



Benefits

Tangible

Intangible

New incomes
Economic savings
Time savings, etc.

Avoid pests
Avoid fire risks
Reduce CO₂

Image of sustainable business
Differentiation from competence
Independence from fossils, etc.

Concluding remarks





To sum up

- Wood from APPR is a relevant renewable energy source, but still not used or **largely under-used**
- Setting up APPR value chains requires significant efforts and a **change in agronomic practices**
- **Many different models** exist and depend on local conditions and peculiarities
- APPR biomass can be **cost competitive** and adaptable to energy plants or appliances after simple technical adjustments
- Economic margins are tight and **intangible benefits** may play a crucial role.
- Interesting synergies can be found with **municipal waste managers** (e.g. provision of machinery)
- It is fundamental to **transfer knowledge** and **build new capacities for consultants**



Policy recommendations

- Agricultural residues touches **both the agrarian and the energy policies**. Coordination among both Ministries is a must.
- Reducing risks for investors during the first stage of development: **incentives for deployment of novel technologies** for collecting, treating and valorizing APPR biomass, or for APPR bioenergy facilities
- Establishment of **agro-residues use as a best practice in agriculture** (e.g. as part of conditionality in CAP)
- Restricting strongly the conditions for agro-residues disposal or open-air burning
- Recognizing the high intangible values of agrarian residues in energy plans and policies, and establishing a separate category of biomass
- Mentioning and quantifying APPR potentials in the new Integrated Energy and Climate Plans

More details in the uP_running “Policy Guidelines and Roadmap”



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



Each branch counts!

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