



Promoting the penetration of agrobiomass heating in European rural areas

# Spain experience on the use of agrobiomass



**WBA Webinar Series – Agricultural Residues**

Webinar 2: National experiences on feedstock mobilization, policies and regulations

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## Why agrobiomass (Spain) ?

- Local and endogenous fuel, renewable, available in large quantities and in some cases underused.
  - Avoid uncontrolled emissions from burning agricultural residues (stubble)
  - Rural development “España Vaciada” (“Emptied Spain”)
- Modern technologies with low emissions and high efficiency



straw



prunings



miscanthus



Short Rotation Coppice



nut shells



olive stones

		POTENTIAL (t DM/y)	AVAILABLE (t DM/y)
Forests	Conifers	3.031.382	1.438.717
	Broadleaves	3.601.615	1.594.704
	Mixed forests	893.080	549.137
	Shrubs	2.080.482	937.845
	Wooded pasture	941.701	252.248
	<b>TOTAL FORESTS</b>	<b>10.548.261</b>	<b>4.772.650</b>
Agriculture	Rain-fed crops	16.944.193	5.420.661
	Irrigated crops	4.682.592	3.746.230
	Rice crops	394.983	316.204
	Olive plantations	1.819.981	1.455.168
	Orchard plantations	1.411.563	1.129.094
	Vineyards	843.949	675.000
	Crop mixtures	123.225	99.416
	<b>TOTAL AGRICULTURE</b>	<b>26.220.486</b>	<b>12.841.774</b>

Source: Ceder-Ciemat (BIORAISE), project H2020 Biomassud Plus

	CEREALS				INDUSTRIAL CROPS			WOODY CROPS			
	Surface	Grain	Straw			Surface		Surface	Production	Renewals	
Surface	[ha]	[t]	[t]		Crop	[ha]		Crop	[ha]	[t]	[ha]
Wheat	2.061.508	7.985.725	4.401.035		Cotton	65.121		Vineyards	941.515	6.983.256	15.598
Barley	2.569.462	9.129.535	4.953.509		Sunflower	691.276		Olive trees	2.579.001	9.819.569	21.129
Rye	136.251	388.467	204.190		Safflower	12.254		Citrics	297.615	7.528.310	10.565
Oats	556.500	1.486.948	807.051		Soy	1.481		Sweet fruits	269.012	4.044.415	14.197
Other Winter cereals	262.171	803.667	422.303		Rape	78.401					
Corn	322.373	3.842.519	345.527		Tobacco	8.509		Dry fruits	748.345	555.284	6.110
Rice	105.012	808.167	16.722		Others	65.716					
Other spring cereals	10.233	36.547	11.792								
TOTALS	6.023.510	24.481.575	11.162.129		TOTAL	922.758			4.835.488	28.930.834	67.599

Source: Anuario agrícola 2019; MAPA

Spain is a very rich country in  
Agro-biomass:  
1<sup>st</sup> world producer of olive oil,  
3<sup>rd</sup> world wine producer,  
more than 6 Mill ha with cereal,  
leader in citrus, nuts, etc.

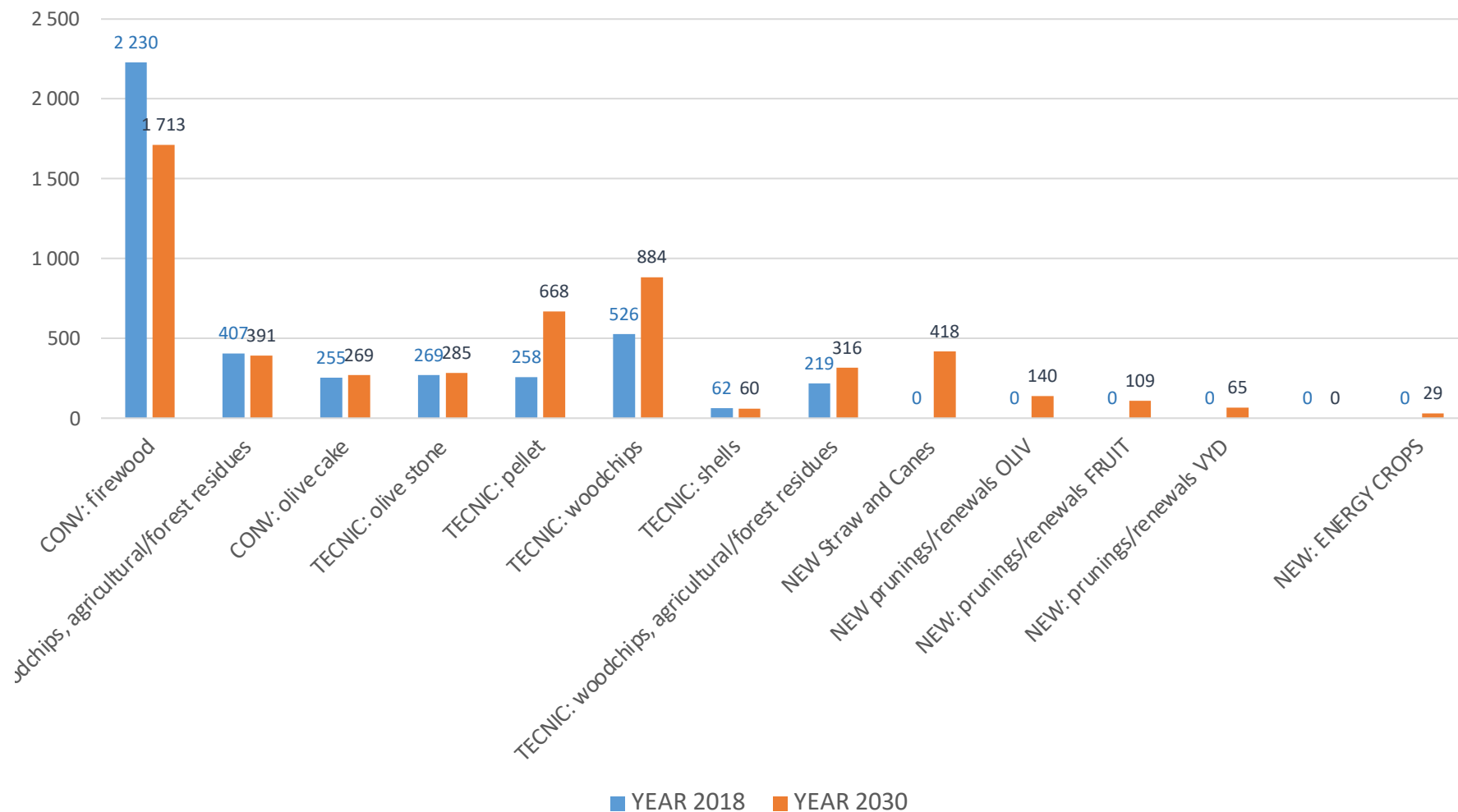
## STATUS ON THE USE OF AGROBIOMASS IN SPAIN

Agrobiomass	Status
<p>Agro-industrial by-products</p> <p><i>Olive stones, olive cake, dry fruits shells (almonds y pine nuts) etc.</i></p>	<ul style="list-style-type: none"> <li>• Markets quite well developed and established</li> <li>• “Easy” logistic</li> <li>• “Tradition” (biofuels being used since years ago)</li> <li>• There is a distribution network relatively well developed and adapted equipment</li> <li>• <b>BUT</b> not always used with the best practices or conditions (obsolete/basic technology, biofuels not valorized (wet olive stones...))</li> </ul>
<p>Agricultural residues (leftovers!!) (primary agrobiomasa)</p> <p><i>Cereal straw, corn cane, prunings, renewals of vineyards/olive/fruit trees), etc.</i></p>	<ul style="list-style-type: none"> <li>• There are some examples that we could consider “Heroic”</li> <li>• Not established markets (small size 1&lt; MW)</li> <li>• Multiple barriers: logistic, not easy combustion, not adapted equipment...).</li> </ul>
<p>Energy Crops</p>	<ul style="list-style-type: none"> <li>• Small surface..abt for heating purposes. Small surfaces for demonstration purposes</li> <li>• Possible small cases not visible</li> </ul>



English **Español** Français Hrvatski Română Ελληνικά Українська Dansk

## ktep: market in 2018 and projections 2030 in Spain

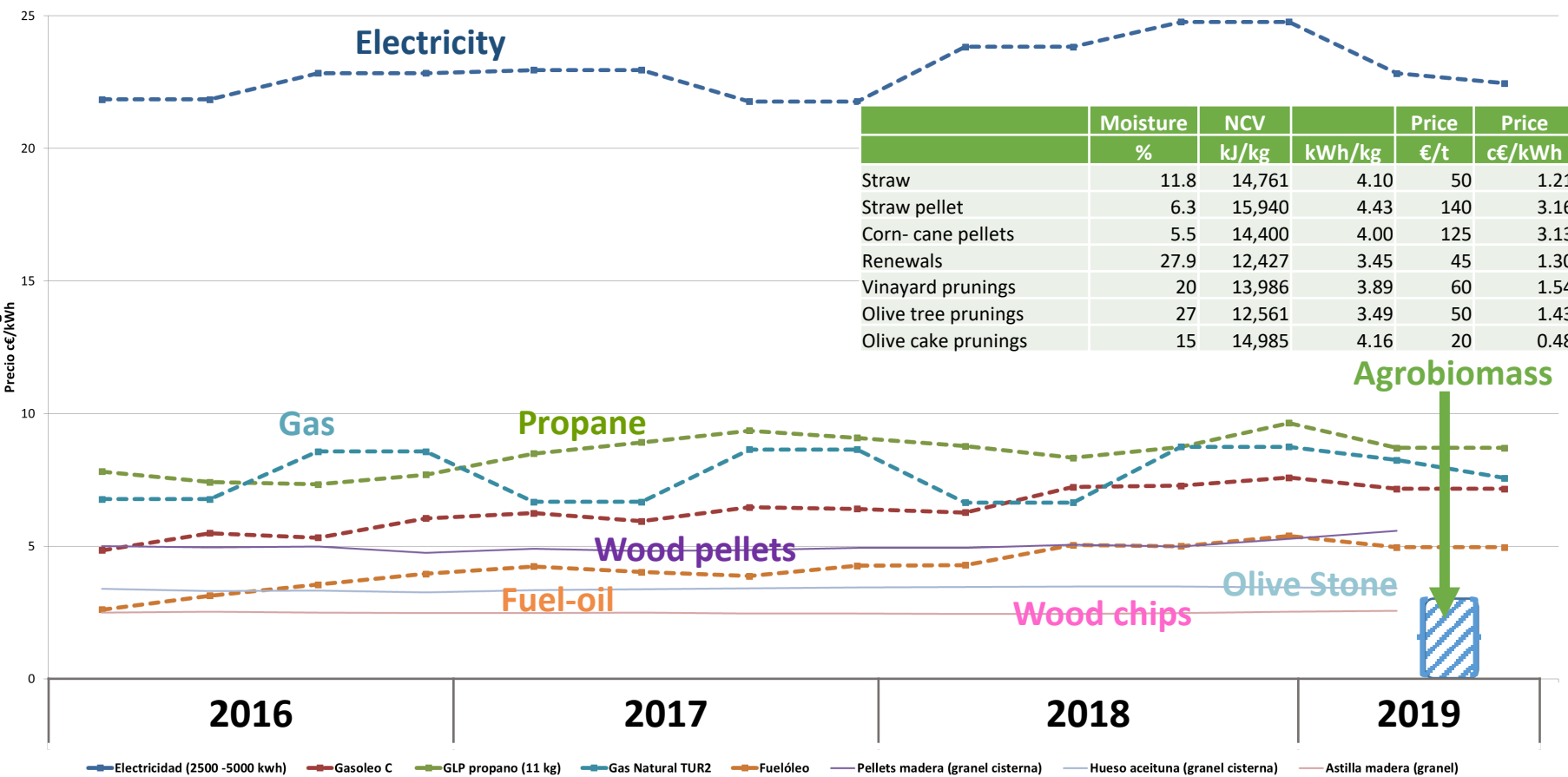


Source: AVEBIOM - Agrobioheat project



Comparativa precios combustibles Marzo-2019

Price c€/kWh



## PRICE ESTIMATION FOR SOME AGROBIOMASS

- Straw 50 €/t NCV: 3523 Kcal/kg (11,8%) → 1,22 c€/kwh
- Straw pellet: 140 €/t NCV: 3807 Kcal/kg (6,3%) → 2,94 c€/kwh
- Corn cane pellet: 125 €/t NCV: 3807 Kcal/kg (5,5%) → 2,60 c€/kwh
- Fruit tree renewals (Wood chips): 45-70 €/t NCV: 3.439 Kcal/Kg (27,9%) → 1,13–1,75 c€/kwh
- Olive tree prunings (firewood): 45-70 €/t NCV: 3005 Kcal /kg (27%) → 1,29–2 c€/kwh
- Vineyard prunings: 50–70 €/t NCV: 3346 Kcal (20%) → 1,29 – 1,8 c€/kwh
- Olive Cake: 20 €/t; NCV: 3585 Kcal/kg. (15%) → 0,48 c€/kwh



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# Thank you for your attention!

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