



CENER

CENTRO NACIONAL DE ENERGÍAS RENOVABLES
NATIONAL RENEWABLE ENERGY CENTER OF SPAIN

NOVEL TECHNOLOGY FOR PRODUCING HIGH QUALITY STRAW PELLETS

Torrefaction of agriculture bioproducts
WEBINAR September 20, 2021 (16:00 – 17:30 CET)

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BIO2C – Biorefinery and Bioenergy Centre

www.bio2c.es

PRETREATMENT UNIT

<https://www.bio2c.es/pretreatment-unit/>

<https://youtu.be/MSpAomIG3VE>



Torrefaction Unit



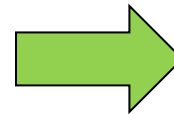
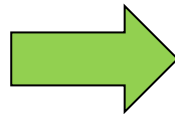
Pelletization Unit

CENER has experience in **herbaceous biomass torrefaction projects** for more than 10 years, including the commissioning and operation of the **pilot plant** (150-350 kg/h).

CENER has been able to produce **high quality torrefied straw pellets** from 2013. Their mechanical durability was higher than 97% and bulk density over 700 kg/m³..



- CENER is developing a **technology** to produce reliable, sustainable and competitive **solid biofuels from residual agrobiomass**, focused on the **decarbonization of industrial sectors intensive in thermal energy consumption**.
 - The technology **combines** the **torrefaction** of residual biomass with processes for the **elimination of certain unwanted inorganic elements** and the **use of additives** that improve the high temperature behavior of the mineral fraction.
- The result is a **solid biofuel** with **high calorific value, very high energy density, low emissions and a high ash melting temperature**.



➤ Pilot tests results:

➤ 2 tonnes of product produced in different batches

➤ **Reduction of 67% of the potassium content**
(based on the energy content of the fuel; that is,
in mg / kWh),

➤ **>95% in the case of chlorine and**

➤ **57 % in the case of sulfur.**

➤ Product cost estimation:

➤ 58.000-116.000 t/y production plant capacity

➤ **27-32 €/MWh**





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