

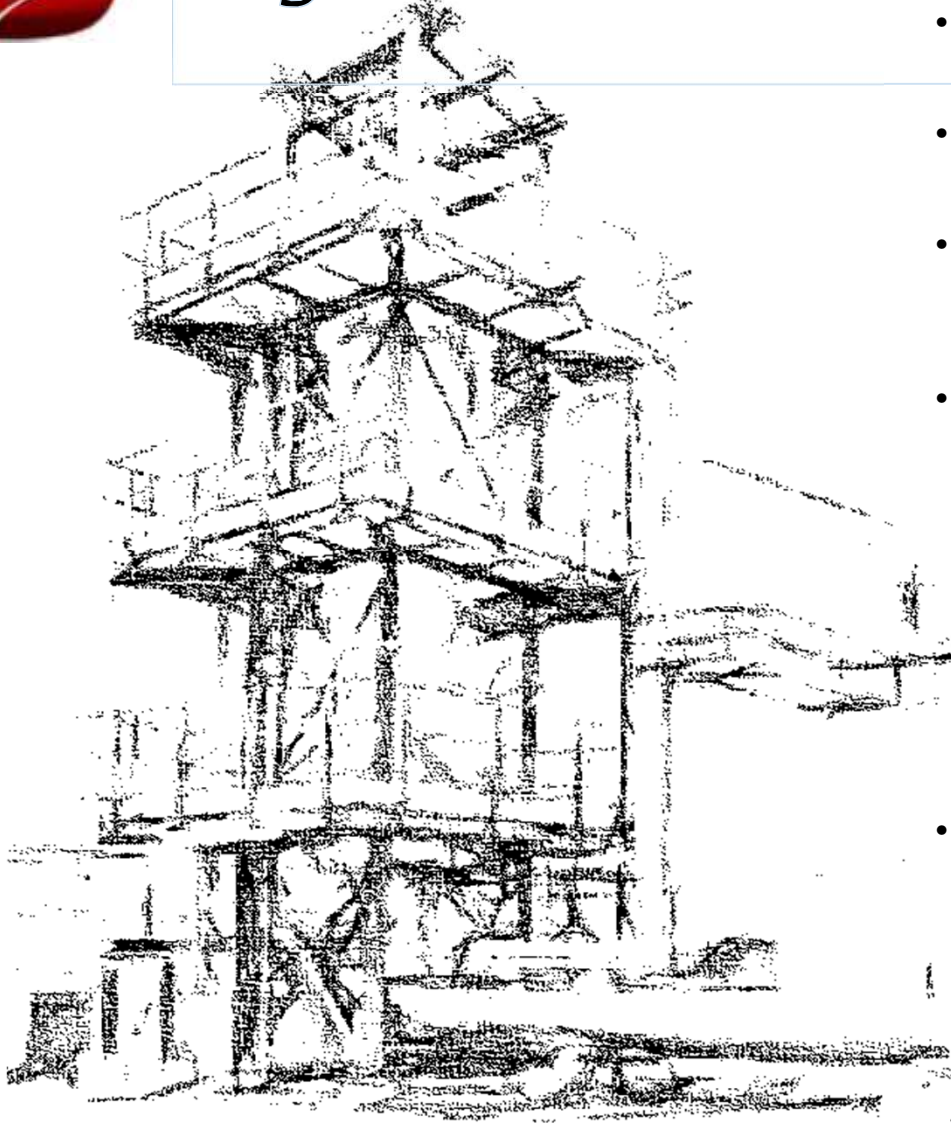


Workshop on the European Strategy in Bioeconomy

September, 2016



Ingelia 's Profile



- Ingelia was established in Valencia in 2005. It started to develop HTC technology in 2007.
- The first industrial plant working in continuous process with HTC technology has been commissioned in Valencia in 2010.
- Patents on the process have been granted to Ingelia in Spain, European Union, USA, Canada, Mexico and Russia and they are ongoing at last stage in other territories.
- Ingelia has been awarded with several recognitions to innovation and sustainability, among others:
 - Ulyses Prize from UNWTO in 2011 to innovation on tourism sector
 - Perseo Prize (Iberdrola group) in 2011 to Innovation on biomass sector
 - Finalist Clean Tech Open in **Spain** in 2012
 - El Mundo Prize (Il Corriere della Sera group) in 2013 to innovation
 - EUBIA Award in 2015 for the advancement of biomass industry
- European Commission Support:
 - FP7 Newapp Project: Financing to research of new applications of HTC technology and products in 2013
 - H2020 SME Instrument:
 - EC Seal of Excellence 2016



Scientific Cluster

Ingelia's project is a European Project, its HTC technology is being developed across Europe in collaboration with local partners and European providers. European Universities are involved in HTC product development and market applications. They are giving scientific support to Ingelia's development units locally and work together with Ingelia's experts on HTC technology in Valencia (Spain).



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OF TRENTO - Italy



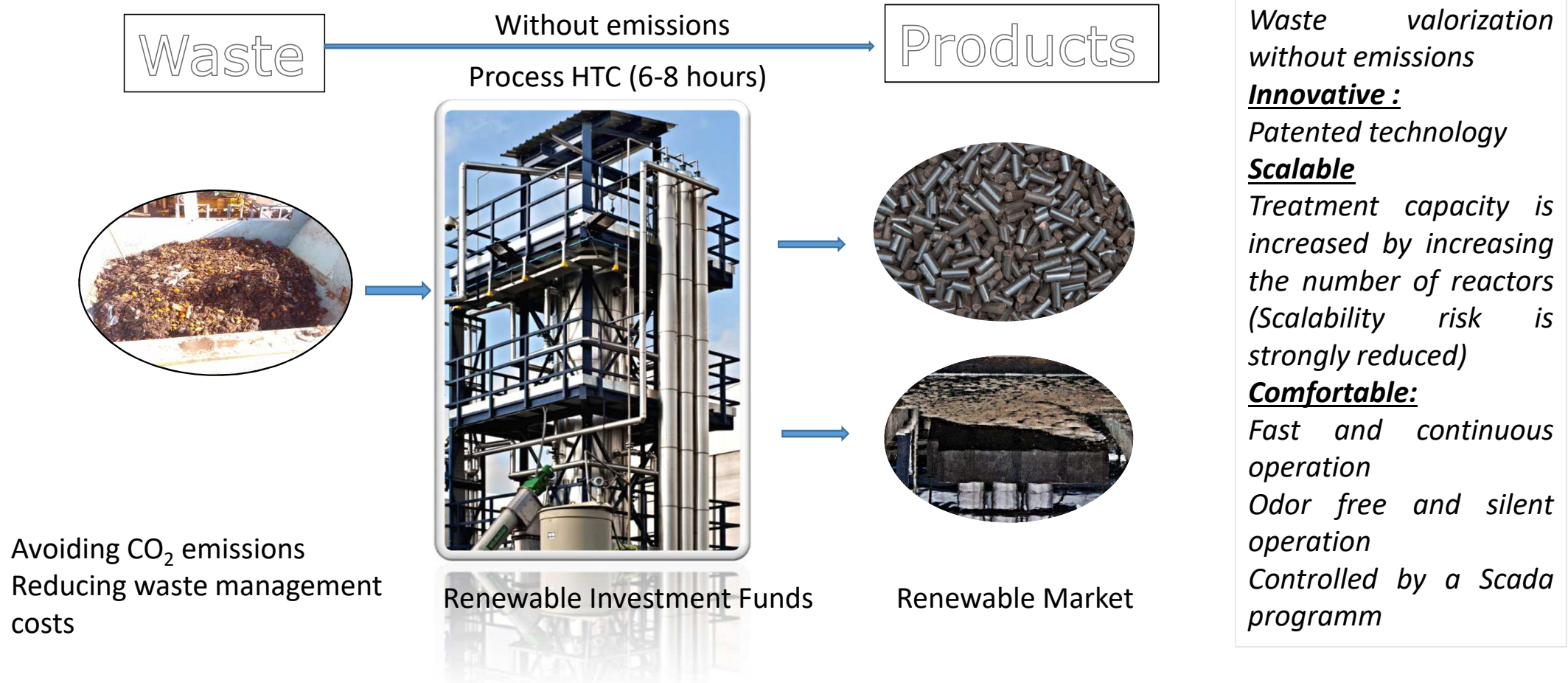
TECHNION
Israel institute of Technology

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Process characteristics

Ingelia's technology transforms organic waste with high moisture content into bioproducts





Strategic sectors: Waste management

- 120-140 million tons/year organic residues in Europe
- Waste to energy policy encouraged by the EC
- Available funds, both public and private for Waste to Energy Projects
- HTC a good solution for the treatment of these materials
- Existing solid fuel market to place the HTC biocoal

Eurostat 2014:

- 42% of MSW in Europe is composted
- 34% of MSW in Europe is landfilled



140 million tons OFMSW

HTC Plants deployment



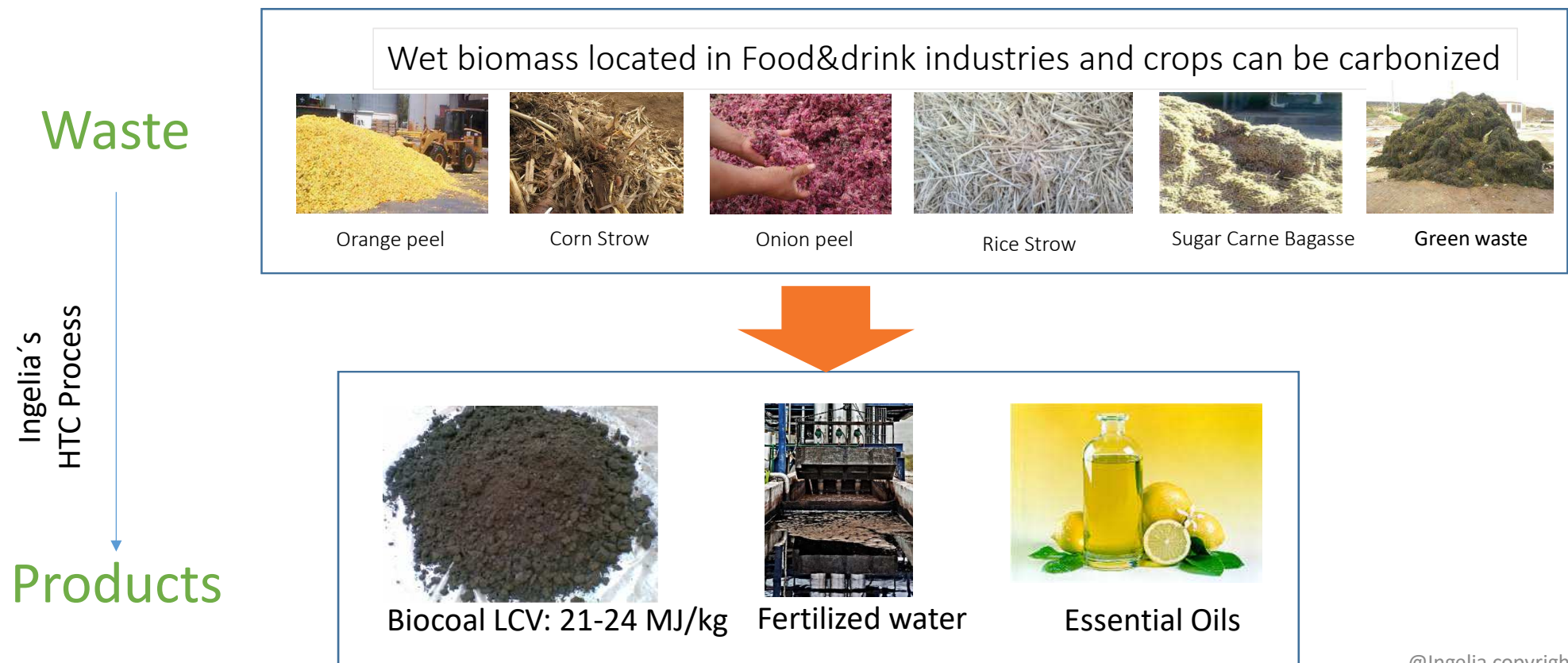
50 million tons coal

- Solving odor problems
- Hygienized products
- Confined space
- Waste transport reduction
- Avoiding CO2 emissions
- Available market for HTC products
- Reduction of waste management costs
- Attractive investment for private investors, reduction of public debt
- Coherent with the European Commission objectives



Strategic sectors: Agricultural&Forestry waste

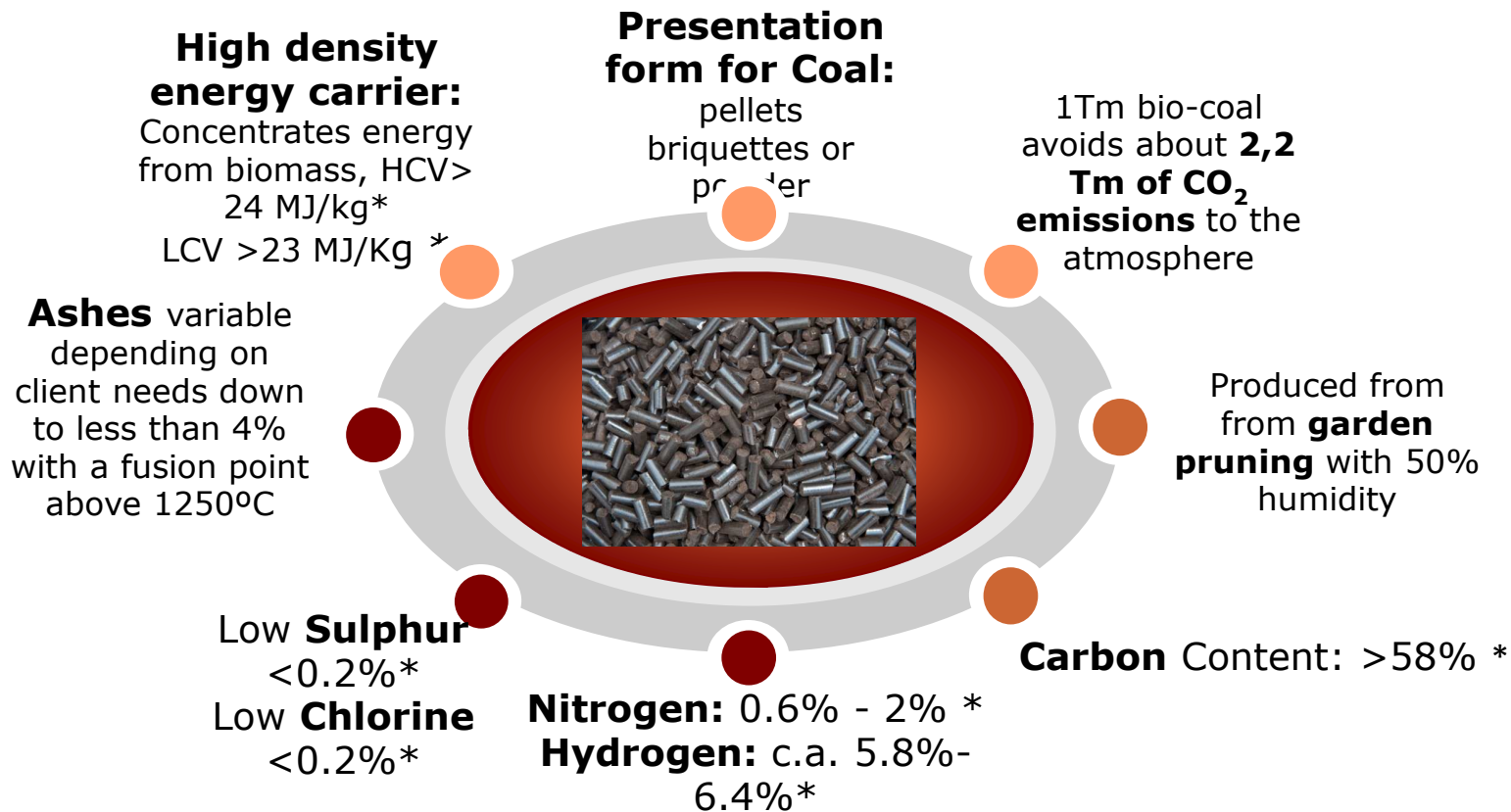
Agroindustries generate big amounts of wet organic residues, suitable to be valorized into high quality bioproducts. Ingelia's technology provides a more sustainable and cost efficient solution.





The Products: HTC biocoal

HTC Biocoal is a lignite like product, complying with the EU standards for solid biofuels. However, more uses and applications for bioindustries are currently under research process, where Ingelia's technology can be used as CO₂ sink technology.



* On dry basis net of ashes

Good logistic proprieties

- Hydrophobic
- High density
- Combustion in standard boilers
- Use as raw material for industrial processes (research)
- Use for soil ammelioration (research)
- Good proprieties for gasification



The products: Fertilized water

Water production comes from biomass humidity. It contains soluble elements present in the biomass which act as biofertilizers and reduce the need of chemical fertilizers preserving groundwater's quality.

ivia

instituto valenciano
de investigaciones agrarias

Research since 2011

The nutrients come back to the soil

High
content
of N and
K



Investigated
by IVIA

Valid for irrigation

1. Nutrient concentration by osmosis process.
Destination to biofertilizers market

2. Soil amelioration (content of organic matter
and nutrients)

3. Biogas production

Studied by University of Hawk in Germany

Organic matter extraction by water gasification

After 3-7 days the organic matter content is
reduced between 70-90% a gas containing 60% of
methan aprox. is obtained.



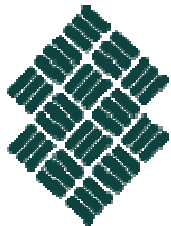


The biocoal commercialization

Offtakers



Brokers

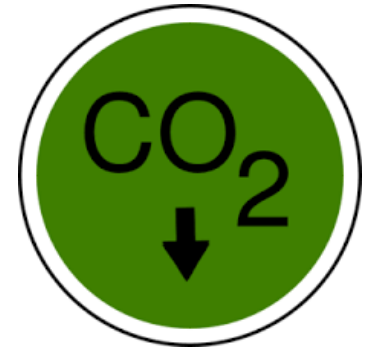


WPS
woodpelletservices.com

- Ingelia's strategy to bring HTC technology to commercial stage has led to a partnership with offtakers and brokers, with the aim to promote the use of HTC biocoal as a green and renewable fuel.
- Ingelia works together with them on biocoal commercialization to offer our clients offtake contracts for their HTC Plants. CPL is the largest manufacturer of solid fuel and is the leading distributor of solid fuel products in the UK, delivering more than 1 million tonnes/year in the European Market.
- WPS is a Brokerage Agency and Consultancy firm with an annual portfolio of over 2.5 Million ton of wood pellet supply under management. It has expanded its consultancy work to the Americas extending its brokerage activities there in 2012, successfully building an annual portfolio of over 2 Million ton in the region.
- A number of HTC plants are being established with offtakers providing offtake agreements for the biocoal produced.
- CPL Industries is also minority shareholder of Ingelia and is promoting Ingelia's HTC technology in the UK and Ireland, working together with UKTi support.



HTC contribution to bioeconomy



- The Process as a way to valorize organic waste
 - *it contributes to reduce CH₄ and CO₂ emissions from waste natural fermentation*
 - it is much quicker as other competing processes for waste valorization, therefore the installations need less space
 - Odors and noises are avoided, so that the Plants can be installed close to the city and reduce transport of residues
- The products
- Production of a lignite like solid which is carbon base for biomaterials as:
 - Adsorbents for filters and water treatment
 - Carbon materials for polymers manufacturing
 - Very good feedstock for gasification (energy and chemical industry)
 - Active carbon
 - Product for soil amelioration and agriculture
- Production of a liquid fertilizer for agriculture
 - Recovery of phosphor
 - Substitution of chemical fertilizers



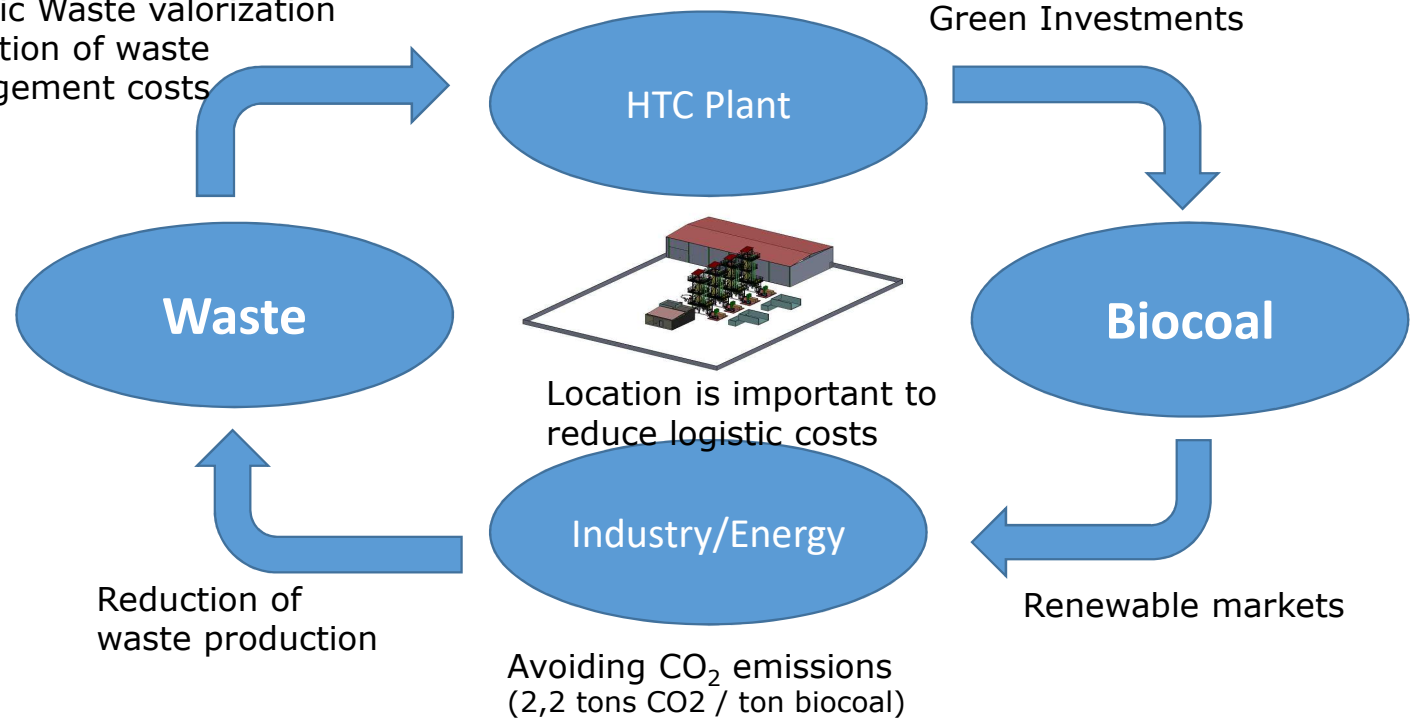


The Project sustainability. Ingelia's Biorefinery concept

Ingelia's technology allow to scale up each plant in relation to the amount of available wet biomass in an area (municipality, industrial area or agritech industry), reducing logistic costs and creating local value by installing local biorefineries.



Organic Waste valorization
Reduction of waste
management costs



Local Circular Economy



Ingelia HTC deployment

Ingelia's technology is being deployed across Europe since 2014. The deployment strategy is based on starting up JV with well-established partners in each country. Deployment in Spain, Italy, UK, Ireland, Portugal and Poland has been started within Europe. Next steps are Belgium and Israel.

Clients and potential partners in USA, Mexico and Canada have shown interest to partner with Ingelia. This fact represents an opportunity for Europe to export technology and industrial equipment.



EC Support

SME Instrument Programm

Jessica-FIDAE

Regional Incentives

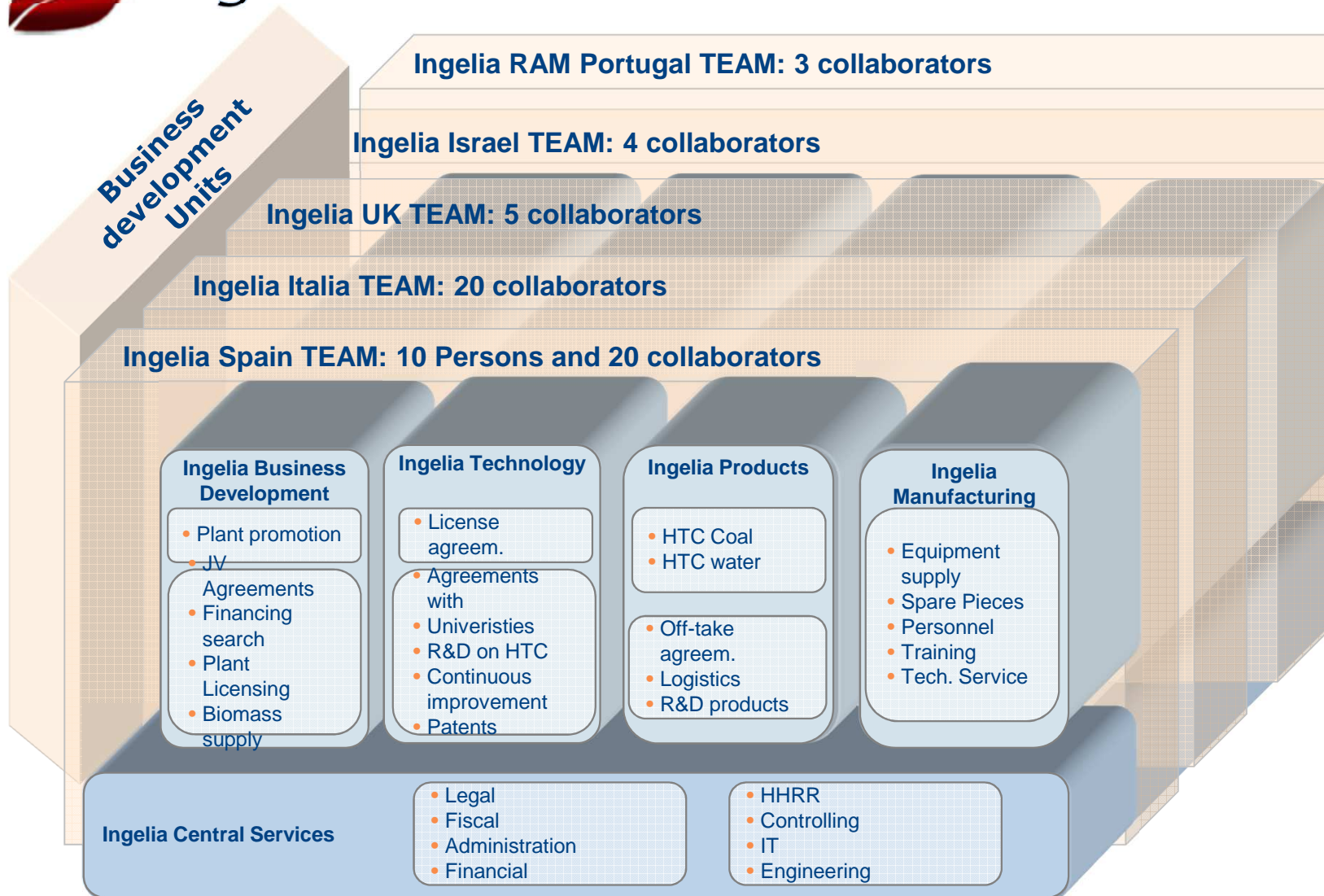
FEDER for Renewable Energy



RE:NERGY

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Ingelia's structure for international deployment



Core business services (support for business development, technology and know how, financing tools, offtake contract for products, core equipment and engineering) are supplied by Ingelia's HQ in Valencia

Operation's activites for Project implementation (commercialization, installation and maintenance, administrative procedures) are locally provided by BDU's.



Conclusions



HTC technology brings a new opportunity to....

- Transform waste into products
- Boost innovation
- Protect the environment
- Create a new model of circular economy
- Huge opportunities for new market applications

.... Following the directives of the European Commission with profitable and sustainable results.





Collaborating Institutions



FINANCIADA POR:



MINISTERIO
DE INDUSTRIA,
ENERGÍA Y TURISMO



Unión Europea

Fondo Europeo
de Desarrollo Regional
"Una manera de hacer Europa"





<http://www.ingeliahtc.com>

<http://www.ingelia.it>

<http://www.cplindustries.co.uk/content/cpl-ingelia>

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