

Dynamique et perspectives d'industrialisation de la filière pyrogazéification

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AGENDA

1	COMPANY PROFILE
2	OUR SERVICES
3	OUR MAIN REFERENCES
4	GASIFICATION CASE STUDIES

1 - COMPANY PROFILE



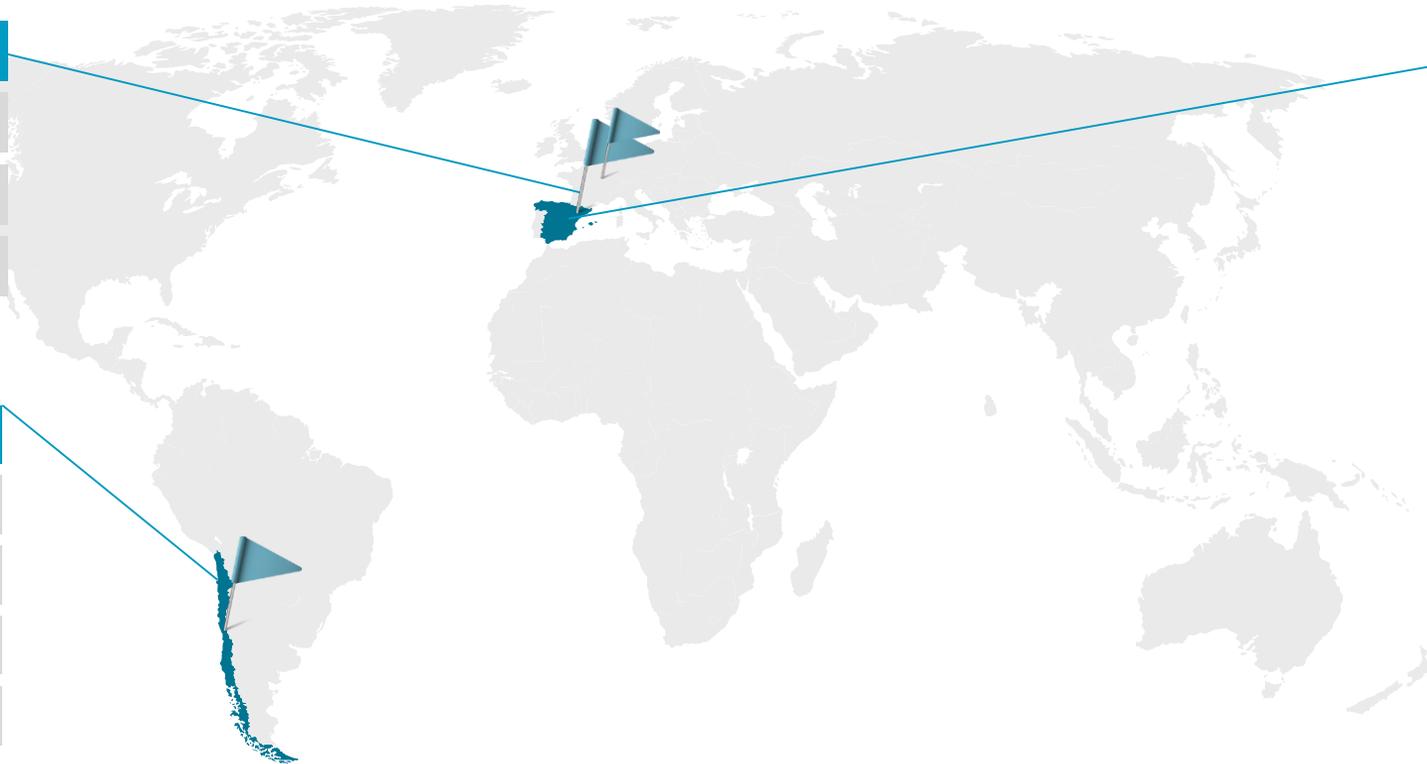
HISTORY - NEOELECTRA GROUP



NEOELECTRA MARKETS – KEY FIGURES

FRANCE	
1	Project under construction
1	Gas Commercialization
1	Power comercialization

CHILE	
40	Employees
5	Generation asset
11,1	MWe operation
15	MUS\$ Anual Revenues



SPAIN	
185	Employees
16	Generation assets
190	MWe operation
> 1	TWh commercialized
70.000	Ton CO2 recovered
150	M€ Anual Revenues

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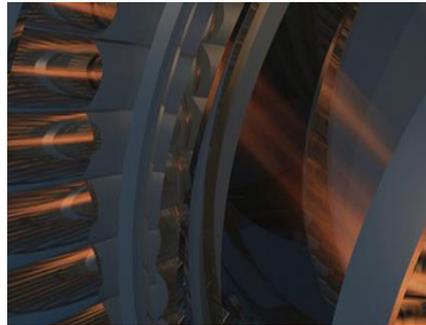
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2 - OUR SERVICES

NEOELECTRA ACTIVITIES



GENERATION

Neoelectra generation is the third independent heat and electrical energy company in Spain, with **205 MW**.

- ✓ 15 cogeneration assets in Spain
- ✓ 2 biomass assets in Spain

- + **11MW** installed in Chile
- ✓ 1 biomass asset in Chile
- ✓ 1 trigeneration asset in Chile



SERVICES

Engineering Procurement Construction and Operation and Maintenance specialists of de industrial plants

Energy services to improve efficiency and reduce costs

Personalised solutions for the **technical services**.

Gasification technology.
Waste to Energy services

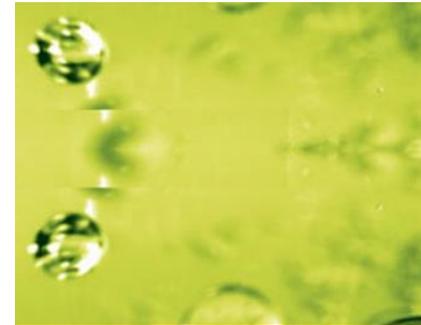


COMMERCIALIZATION

Natural gas and electrical energy supply with flexible supply contracts and indexed

Optimisation of electrical power

Representation of producers



INDUSTRIAL GAS

Patent for CO2 recovery

Neoelectra industrial gases **markets 70,000 T/year of CO2**

ISO 22000 accreditation for management of the safety of food products

4 production plants



LOGISTICS

Comprehensive multimodal transportation services (national and international)

Fully loaded, industrial and refrigerated



Innovative solutions for sustainable industrial development



3 - OUR MAIN REFERENCES

Actual technical references in CHP

An actual portfolio composed of 200MWe in different types of technologies with top tier manufacturers for best in class clients

Plant (gross power)		Engine(s) / Turbine(s)	Industrial client
El Grado	(25,2 MW)	8 Engines  Rolls-Royce	CARBONECO® (Carboneco)
Aliaga	(24,6 MW)	7 Engines  Rolls-Royce	CARBONECO® (Carboneco)
Aran	(15,9 MW)	5 Engines  Rolls-Royce	CARBONECO® (Carboneco)
FdP Cogen	(16,4 MW)	6 Engines  (G.E.)	DCOOP (Orujera)
NE Moron	(10,9 MW)	4 Engines  (G.E.)	ESPUNY MORÓN (Espuny)
NE La Roda	(9,7 MW)	5 Engines  (G.E.)	MIGASA GRUPO (Migasa)
NE La Luisiana	(7,2 MW)	4 Engines  (G.E.)	MIGASA GRUPO (Migasa)
NE Dos Hermanas	(5,2 MW)	3 Engines  (G.E.)	MIGASA GRUPO (Migasa)
NE Menjibar	(3,6 MW)	2 Engines  (G.E.)	MIGASA GRUPO (Migasa)
Neo SC Cog	(8,6 MW)	2 Steam Turbines CENTRAX	Pascual (Leche Pascual)
Neo Ames	(7,3 MW)	2 Engines CATERPILLAR	FEIRACO (Feiraco)
Ecoenergia	(15,6 MW)	2 Engines  WARTSILA	
NeoMas	(11,1 MW)	1 Steam Turbine TGM TURBINAS	MASISA (Masisa)
FdP Biomass	(7,6 MW)	1 Steam Turbine  Peter Brotherhood	
AFAP	(8,0 MW)	1 Steam Turbine DRESSER-RAND	
Covisa	(23 MW)	2 Engines  WARTSILA	deretil (Deretil)
VAG	(16 MW)	6 Engines  (G.E.)	GAP

Total 216 MW

Fuel
 Biomass
 Natural Gas
 Pork Manure



REFERENCE: Biomass cogeneration - MASISA

Customer: MASISA

Production plant of boards and MDF located in Cabrero, Bio-Bio region.

Services

- Steam and electricity generation with biomass resources. 35 t/h steam. 11 MWe.
- PPA – 15 years:
 - Electricity (65 GWh/year)
 - Steam (215.000 T/year)



- **Customer needs**
 - Cover the steam needs in board drying facilities
 - Cover the electricity needs of various production plants
 - Guarantee **costs**, with service **24h/day 365 days/year**
- **Neoelectra Solution**
 - **Acquisition of steam and electricity cogeneration plant** using biomass and fuel by Neoelectra
 - **PPA contract for electricity supply** to 3 Masisa plants
- **Results**
 - **Improvement works** in the installation for the improvement of power, efficiency and availability.
 - **Costs reduction** derived from the correct maintenance of the installation.
 - **Significant incidents decrease** in the technical facilities of the plant

REFERENCE: Cogeneration and biogas –PASCUAL GROUP



Customer: Leche Pascual

Dairy products production plant located near the city of Aranda del Duero, center of Spain.

Services

- Steam and electricity cogeneration using natural gas.
- 9,8 Mwe installed.
- Electricity generated: 60 GWh/year
- Steam Generated: 100 GWh/year.

- 15 years duration



- **Customer needs**
 - To cover the **steam** needs of its production milk and dairy products, to guarantee **costs**, with a **24/7 service 365 days / year**
 - **Focusing on core business**
- **Neoelectra Solution**
 - **Supply of 100% steam needs for thermal recovery** over cogeneration and supplement engines with conventional boilers.
 - Competitive price thanks to the high performance of the cogeneration. Increased efficiency thanks to Neoelectra and technologist intervention.
 - **Use biogas** from the RILES plant for its valorization as a fuel in conventional steam boilers.
- **Results**
 - 100% availability of steam supply.
 - **Cost reduction** in thermal production
 - **Significant incidents decrease** in the technical plant facilities, producing an improvement in finished products operating costs.

REFERENCE: Cogeneration - MIGASA



Customer: Grupo Migasa

Cogeneration plants with gas engines located in Andalucia, Spain.

Services

- 4 steam and electricity cogeneration using natural gas.
- 25 Mwe installed.
- Electricity generated: 208 GWh/year
- Steam Generated: 65 GWh/year.



- **Customer needs**
 - To cover the **steam** needs of its production milk and dairy products, to guarantee **costs**, with a **24/7 service 365 days / year**
 - **Focusing on core business**
 - Ensure the availability of the facilities
- **Neoelectra Solution**
 - Efficient thermal supply in different group facilities.
 - **Supply of 100% of the steam** needs with thermal recovery on cogeneration engines.
 - Competitive price thanks to the high performance of the cogeneration. Increased efficiency thanks to Neoelectra and technologist intervention.
- **Results**
 - 100% availability steam supply
 - **Cost reduction** in thermal production

REFERENCES : CHP and Biomass – Fuente de Piedra



Customer: DCOOP

CHP + Biomass facility with 6 gas Engines, a biomass boiler and a Steam Turbine located in Malaga (Spain)

Services

- CHP (electricity and thermal energy, using natural gas)
- Biomass facility with olive waste resulting from the industrial process and forest waste.
- 25 Mwe installed
- Electricity generated: 132 GWh/year
- Thermal energy: 40 GWh/año.



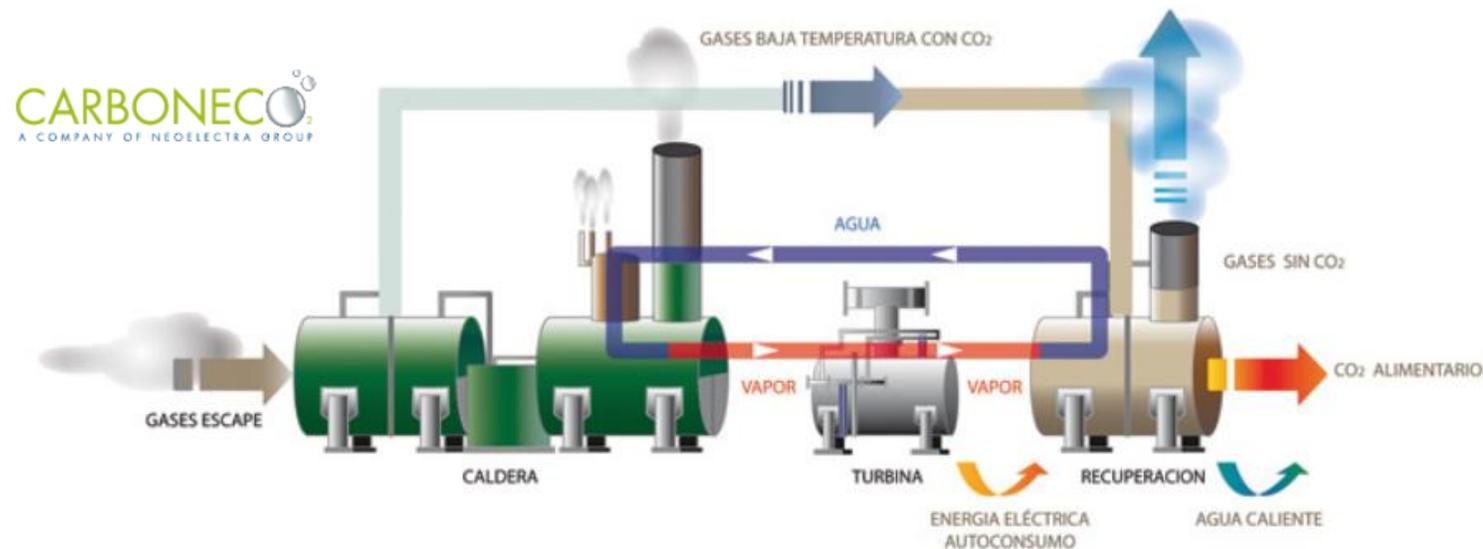
- **Customer needs**
 - To cover the thermal energy needs of its olive oil production facilities, guarantee costs, with service 24h/day 365 days/year
 - **Focus in their core bussines**
 - Ensure the output of the olive waste residue of its industrial process.
 - Ensure the availability of the facilities
- **Neoelectra Solution**
 - Supply of the customer's thermal needs from the cogeneration in the form of exhaust gases.
 - Competitive price thanks to the high performance of the cogeneration. Increased efficiency thanks to Neoelectra and technologist intervention.
- **Results**
 - 100% availability termal supply
 - Industrial process valorization residue
 - **Cost reduction** in termal production

CO₂ Recovery - CARBONECO

We recover CO₂ to contribute to a sustainable industry

Carboneco recovers and recycles the CO₂ that industries emit, transforming this gas—via an advanced technological process—into a highly purified (99.9%) and quality product used mainly by companies which produce carbonated beverages. CARBONECO is involved in many industries through processes that make use of CO₂ emissions. Particularly noteworthy examples include beer brewing, paper pulp treatment, metallurgy, agriculture, etc.

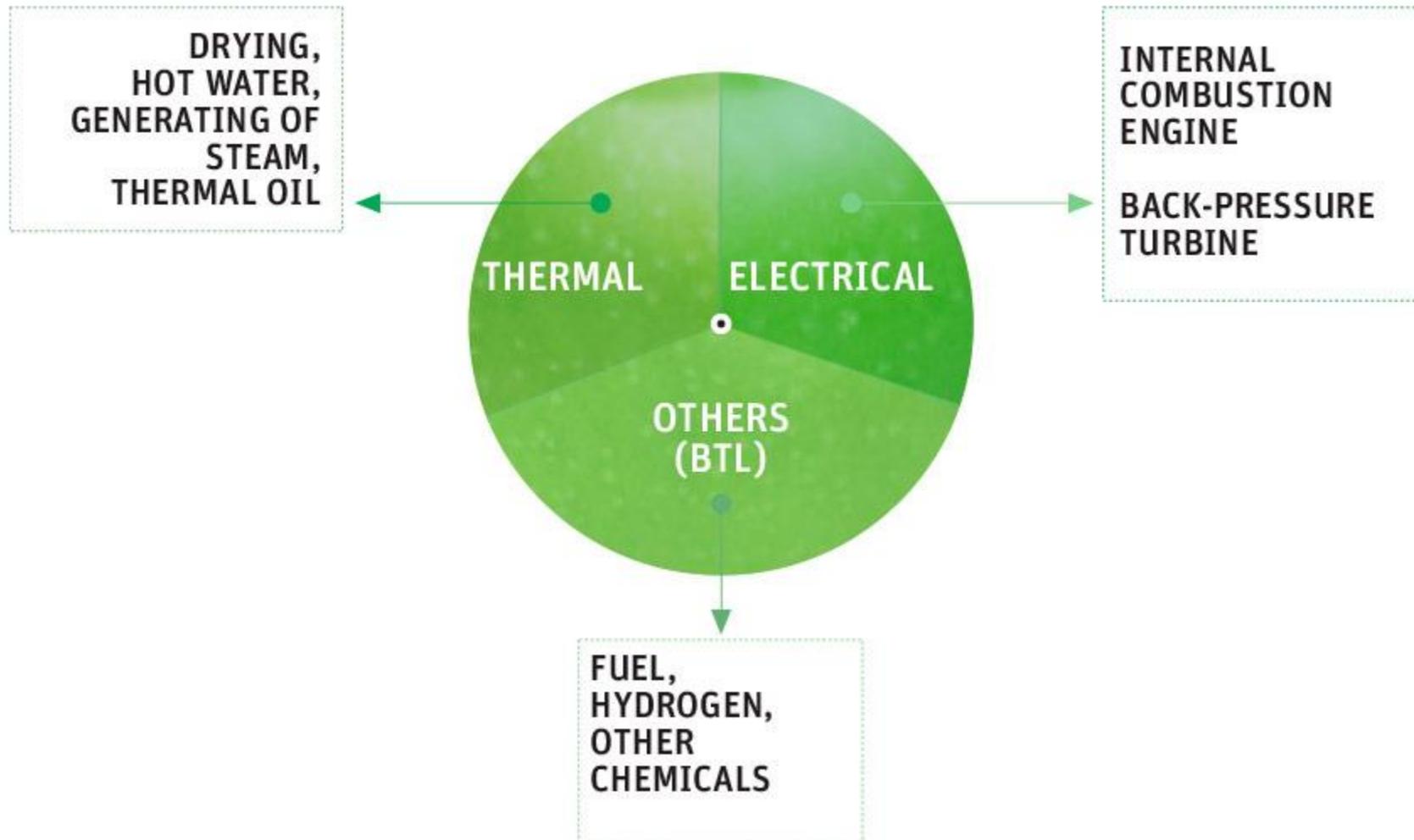
Carboneco is the only European company in the sector to have ISO 22000 accreditation for management of the safety of foodstuff products, and complies with current legislation applicable to CO₂ food quality according to ISBT, EIGA, JEFCA y ANEABE.



4 – GASIFICATION CASE STUDIES



Potential use of syngas



Our services

Processing
of projects

Engineering
(feasibility
studies)

Operating and
maintenance for
O&M (cost
advantages and
working time)

Development
of projects of
producing biogas from
different types of
wastes and
products

We
generate thermal
energy (heat, hot
water, steam, thermal
oil and more),
decreasing fuel
purchase needs

We are a partner
for assessments of
wastes and
by-products

Construction
of “Waste to Energy”
plants, we transform
waste into energy
(power generation,
electricity
production)

Energy synergy
for industries
(energy-intensive)

Environmental
benefits of using
energy:
emission
reduction

REFERENCE: Gasification - São João da Madeira (Portugal)



São João da Madeira (Porto)

Application	Steam production
Combustible	Meat & Bones Meal
Steam Generation	20 Ton/hour
Operating since	2014
Power	16 MWth
Scope	EPC

REFERENCE: Gasification – TAFAP Villacañas (Toledo -Spain)



Térmica AFAP (Toledo)

Application	Power Generation (8MWe)
Combustible	Woodchips
Technical Aspects	Wood Gasification & syngas combustion in a torsional chamber
In Operation since	2010 Bought in July 2015 by Neoelectra

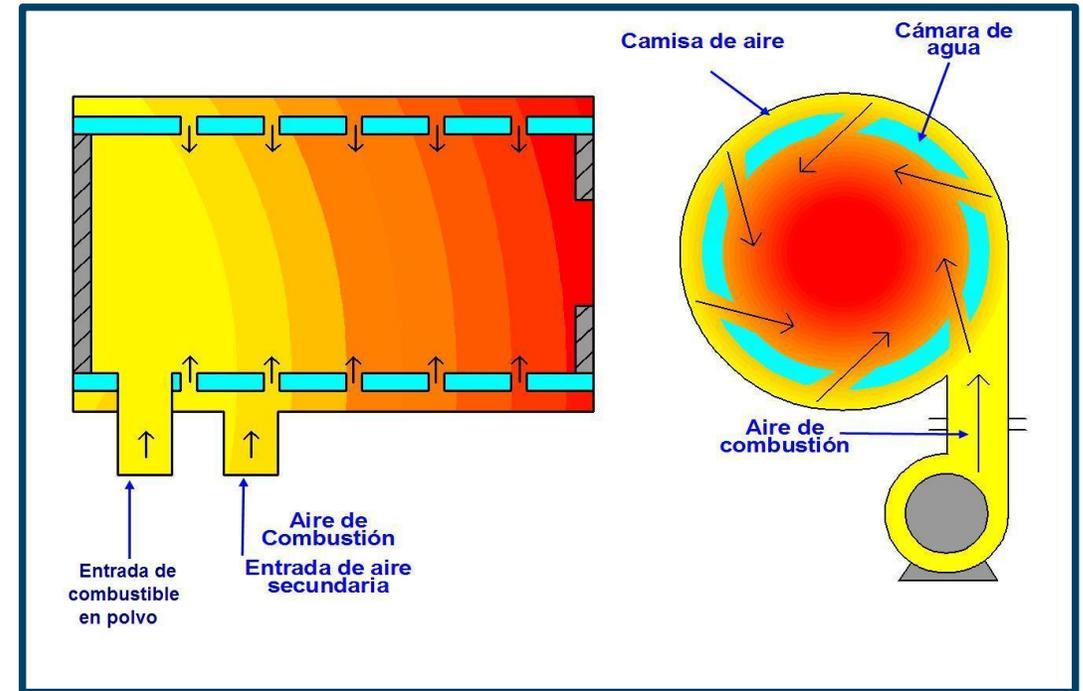
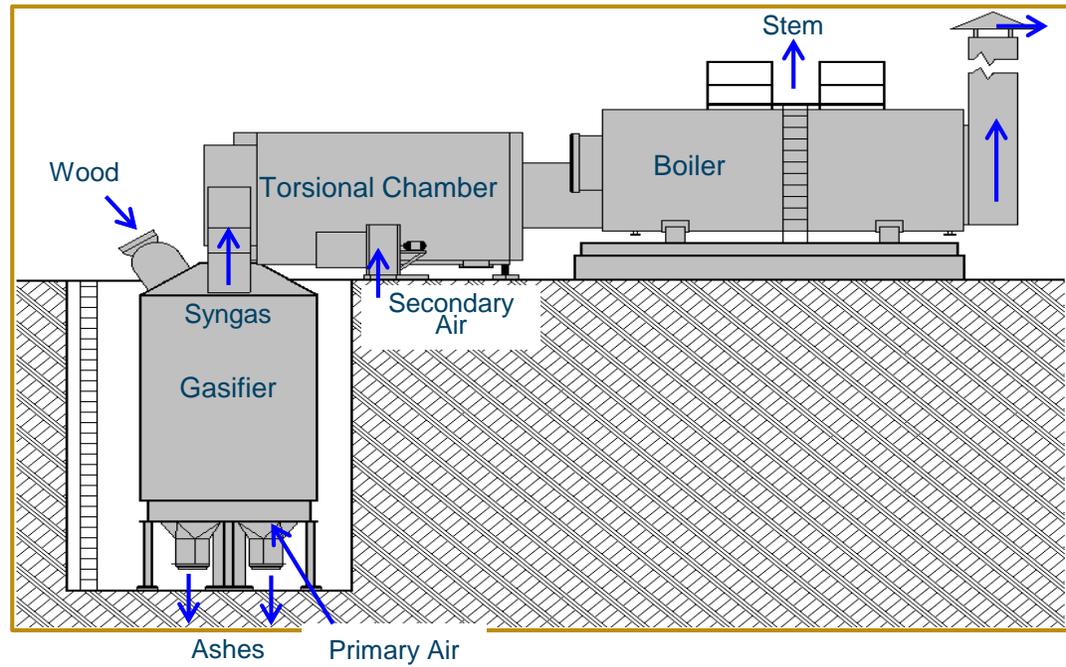
Power: 8 MWe

Water-tube boiler with a capacity of 44 Tn/h of steam - 460°C and 40 bar using double combustion system:

- Gasification of wood in gasifier
- Torsional chamber of syngas
- Torsional chamber of sawdust

More than 8.000h operation per year

REFERENCE: Gasification – TAFAP Villacañas (Toledo -Spain)



REFERENCE: Gasification – Santa Perpétua de Mogoda (Spain)



Santa Perpétua de Mogoda (Barcelona)

Application	Steam Production
Combustible	Woodchips, Plastics, rubber, Residual Biomass and CSR
Steam Production	25 t/h of steam
In Operation since	2018
Power	20 MWth
Scope	Promotion, EPC, O&M including biomass purchase management

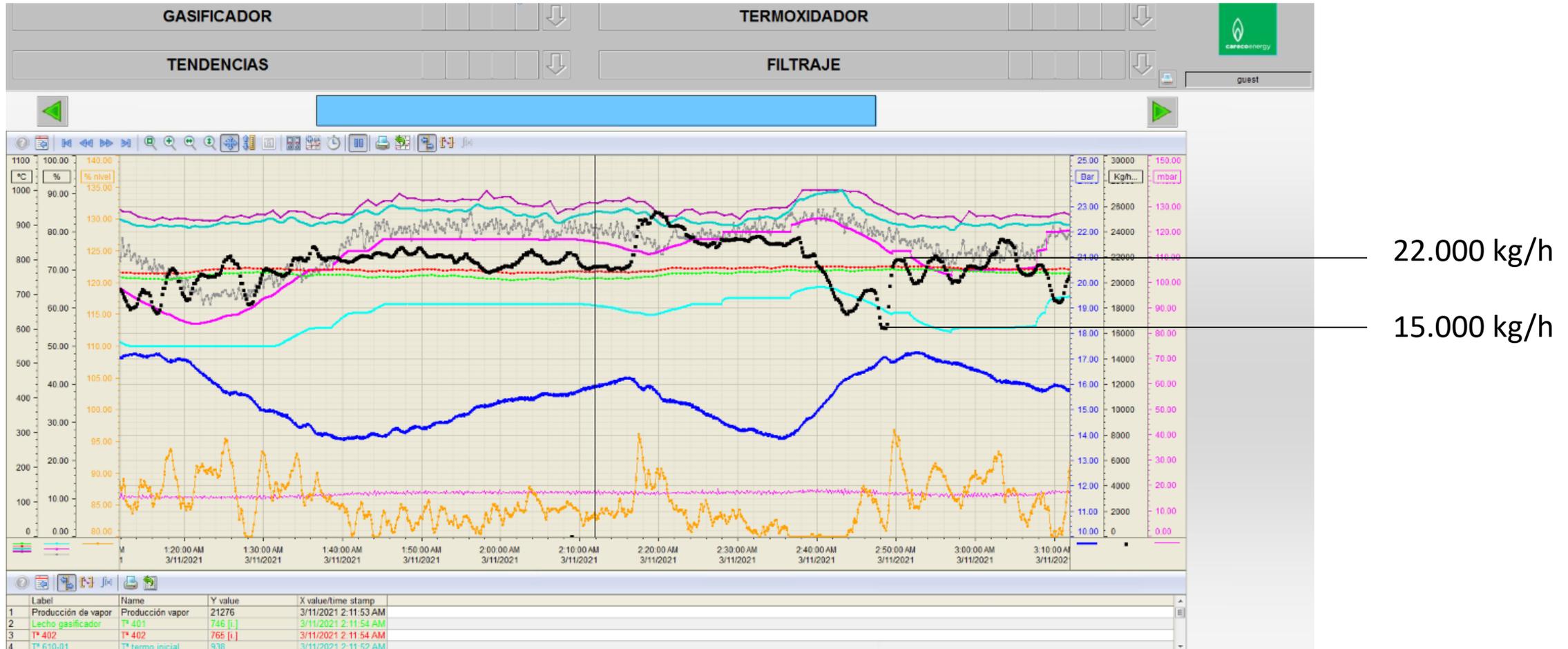
Global view of Lípidos Santiga CSR Gasification Plant



Lípidos Santiga: various feedstock entrance



Lípidos Santiga: flexible steam demand



Graphic from Lípidos Santiga SCADA of the 11th of march 2021

Conclusion : a positive Return on Experience

- Through continuous operation of Lípidos Santiga Plant in Barcelona, Careco has gain a unique expertise on CSR Gasification:
 - Global process (transportation, gasification, combustion, emission...) know how about a wild variety of biomass feedstock (syngas analysis is coming)
 - Administrative legalization
 - Supplier identification
 - Upgrade of the technology (feeding system, process as a all, automatization and safety)

- Reaching
 - Availability = 84,6% (2020, excluding shutdown due to 3rd part and maintenance)
 - Efficiency > 80%

Finally

- Careco holds the Silver Broom Award, awarded by ISWA, The International Solid waste Association



Dr. Joan Solé, Director of CARECO

“We enjoy an outstanding position in the market due to our deep knowledge of the sector and extensive experience in gasification.”





Specialists in producing biogas from waste and biomass



Come and meet us on stand J18 !

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**We are the
partner that
your
company
needs...**

“Waste to Energy”
energy recovery from
waste and by-products

Energy partner,
specialist in project
producing gas from
waste and biomass

The leading company in
waste sector with more
than 10 years of
experience

Gasification reactors
entirely produced by
CARECO