cerámica de la estanca, s.a.

EXPERIENCE GVD BURNER IN A BRICK FACTORY

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Background

It is intended to replace current natural gas burners with polycombustible biomass burners and no flame ash. The absence of ash will allow not to damage the ceramic product during combustion, similar to a gasification process, but with direct thermal transfer.

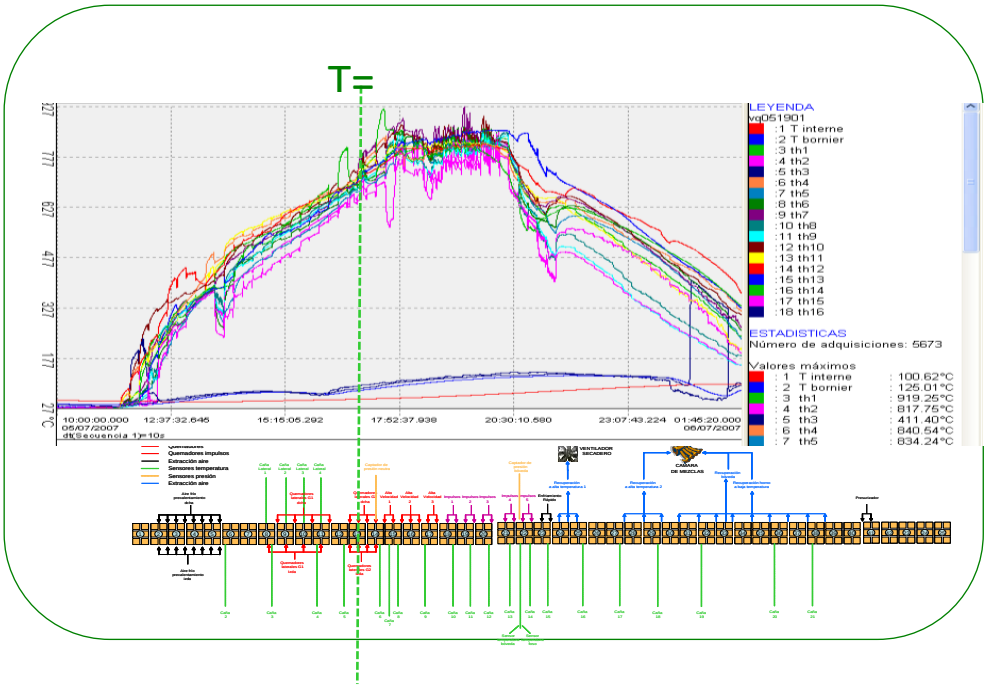
Our objetives were:

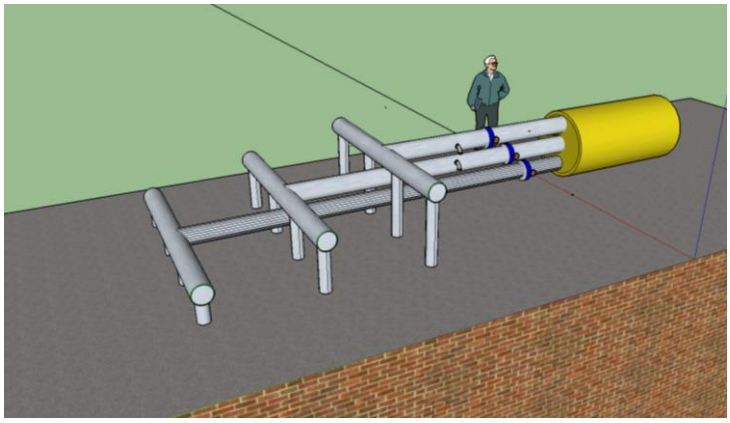
1. **Reduce** our **energy costs** and become a **polyfuel** factory with biomasic waste.
2. **Replace the current Natural Gas burners with polyfuel burners that allow us to reduce** our **dependence on** fossil fuels and **reduce CO2 emissions.**
3. Generate and maintain the **jobs of** the company thanks to the new tasks in the management of biomass.

Project

A GVD 2Mw biomass burner has been installed in the ceramic furnace to inject hot air into it at an appropriate setpoint temperature at the tunnel furnace point.

GVD 1&2





WORKING BIOMASS

During the project, different types of biomass were tested: splinter, grape waste and finally olive waste residum.

Finally the biomass that for price and conditions best adapted to the burner and our process was the olive pomwell in pellet format.

WORKING TIME

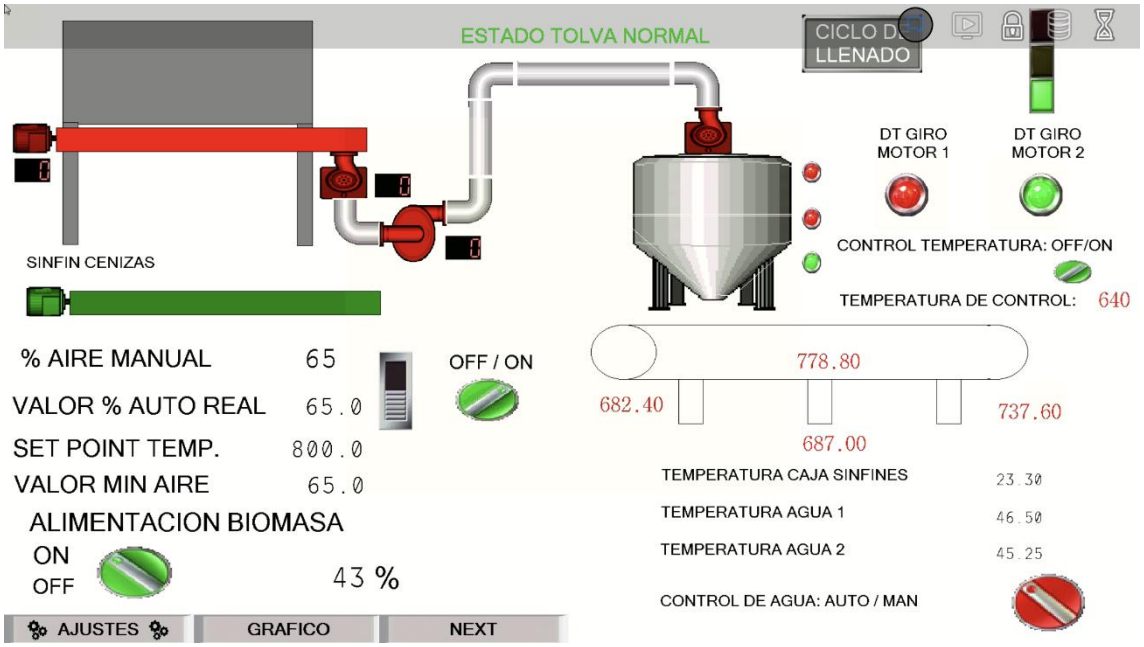
The ceramics industry is going through a crisis in Spain so it only works 6 months each year because of the low demand of recent years.

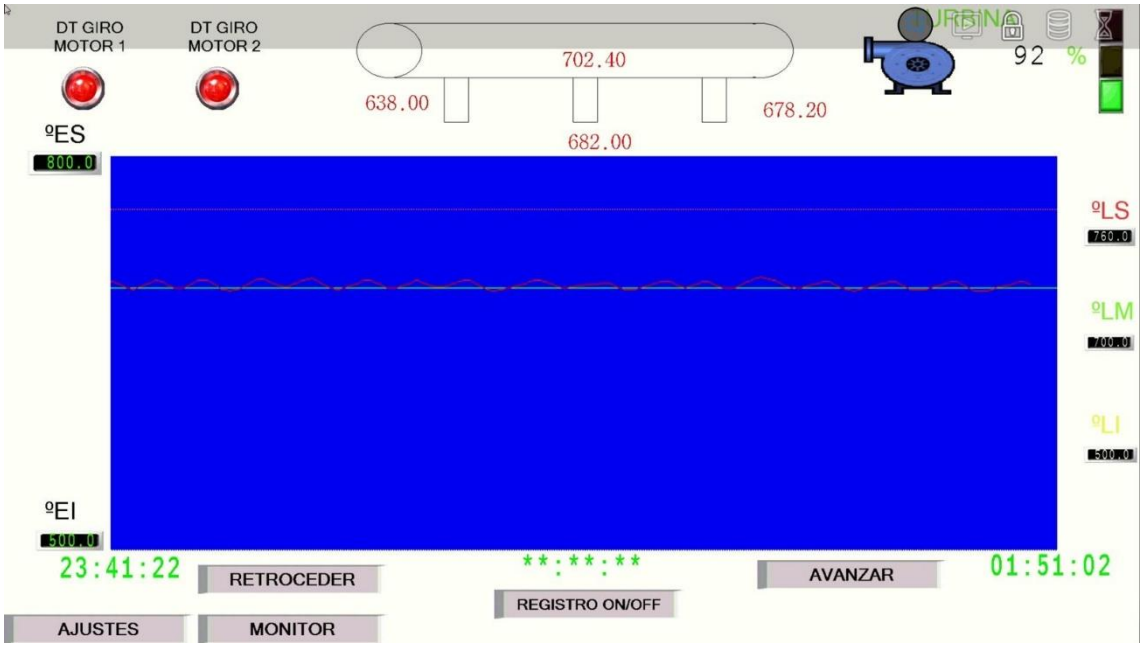
The burner was running for 6 months uninterrupted in 2018 and another 6 months in 2019 and savings in natural gas were significant.

All problems associated with stops were resolved correctly and were mainly due to power outages and problems outside the burner itself. Repair and maintenance consisted in most cases of a simple cleaning of the burner by the factory operators themselves.

REMOTE CONTROL AND MANAGEMENT SYSTEM

A control system was developed that allows us to control the burner remotely even through the mobile phone. This system maintains the temperature in the setpoint value allowing to visualize and modify the parameters for the correct operation of the burner.





FUEL SUBSTITUTE SAVINGS

LOCAL NATURAL GAS 2019 PRICES

NATURAL GAS						
Energy Source	Price in Calahorra	Hummidity	PCI real	Energy cost		
	(€/Nm3)		(GJ/Nm3)	€/GJ	**c€/kWh PCI**	c€/termia
Gas natural	**0,2925**		0,0383	7,363	**2,749**	3,198

LOCAL BIOMASS 2019 PRICES

COKE & ORUJILLO						
Energy Source	Price in Calahorra	Hummidity	PCI real	Energy cost		
	(€/Tm)	(%)	(GJ/Tm)	€/GJ	**c€/kWh PCI**	c€/termia
PetCoke (0-90 micras)	**155,6**	0,5	34,332	4,532	**1,631**	1,897
PetCoke (0-10 mm)	**102**	10	30,838	3,308	**1,191**	1,385
Pellets de orujillo (Ø 10 mm)	**49**	8	17,368	2,821	**1,016**	1,181
Orujillo (sin terrones)	**39**	12	16,513	2.362	**0,85**	0,989

In total the burner was working for 12 months and in the table below we can see the savings obtained in the replacement of the heat generated with the biomass compared to natural gas. It should be noted that Ceramica de la Estanca is a great consumer of natural gas so gas prices are quite low compared to other industries.

BURNER SAVINGS SIMULATOR									
BURNER POWER	BURNER EFFICIENCY	MONTHS WORKING	DAYS PER MONTH WORKING	HOURS PER DAY	EFFECTIVE POWER	TOTAL GENERATED ENERGY	PELLETS ORUJO COST	NATURAL GAS COST	SAVINGS
Kw	%	m	d	h	Kw	Kwh	€	€	€
800	90%	12	30	24	720	6220800	63.203	171.010	107.806

OTHER ENVIRONMENTAL IMPROVEMENTS

1. Residual organic matter is reused as raw material.
2. It is an environmentally clean and CO2 neutral process: It does not increase the greenhouse effect since the CO2 emissions generated in the process are what would have caused the degradation in the biomass atmosphere. The price per CO2 Ton is 25 €/Ton aprox.
3. The only by-product that is generated are ash from biomass that can be used as fertilizer, although in this case they will be used as fuel mixed with clay since they have 10% of the calorific power of charcoal.
4. The project is environmentally clean, complies with Directive 2008/1/EC, the BREF documents and is in complete harmony with Directive 2009/28/EC.

Humberto Martinez Muñoz

Ceramica de la Estanca CEO

Calahorra (La Rioja) Spain 30/12/2019