

Gestamp
Biomass Solutions

COMPANY INTRODUCTION

APRIL 2016

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1. Presentation and history of the company

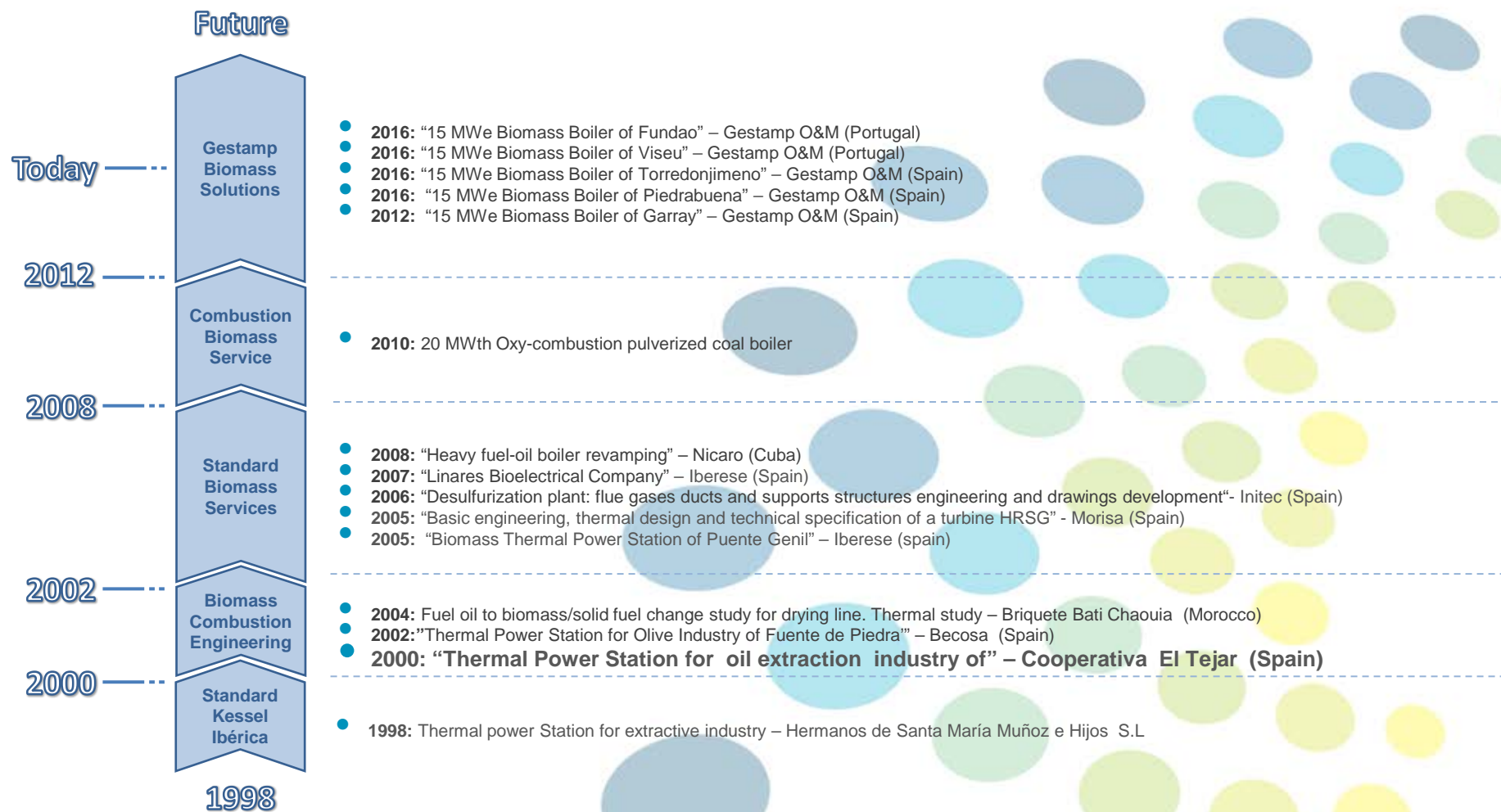
Gestamp Biomass Solutions belongs to **Gestamp Corporation**, a global supplier with more than 40.000 employees, which billed in 2014 more than 12.000 millions dollars by means of its more than 140 plant worldwide.

Inside the group, the main subsidiary companies are:



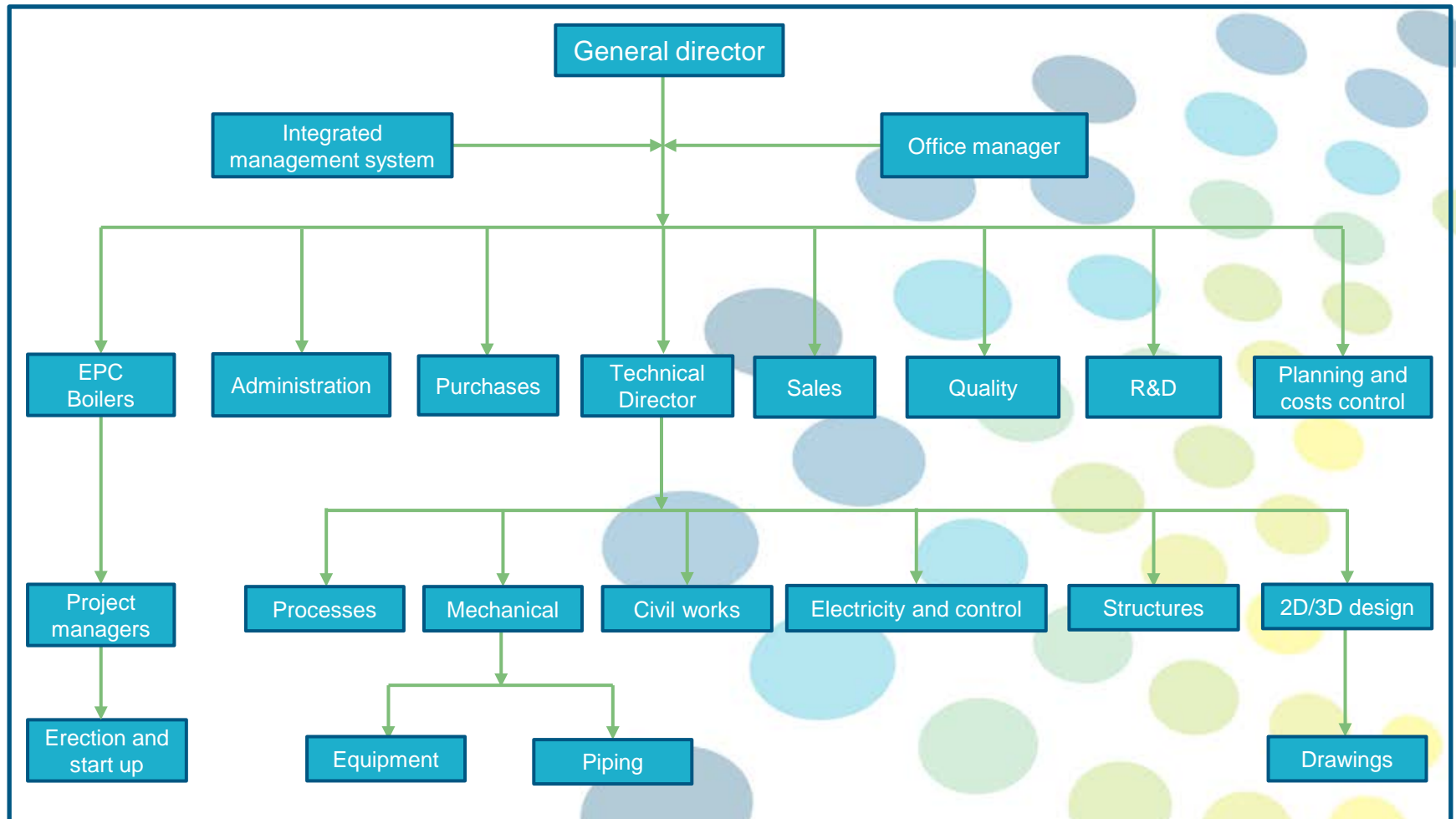
History

The technical staff of **Gestamp Biomass Solutions** has been developing its products through the time from different companies structures, thus forming a large database of knowledge and experience.



2. Company organization and positioning

At present, **Gestamp Biomass Solutions** is constituted according to the diagram shown. The engineers and the technicians are qualified for the different areas where their work is developed.



2. Company organization and positioning

The engineers and the technicians are qualified for the different areas where their work is developed; engineering and design, project management, manufacturing and erection, commissioning, etc.



3. Products and services

The core business of **Gestamp Biomass Solutions** is the design, construction, erection and commissioning of steam generators. Mainly boilers for power plants / CHP plants and industrial big boilers. Within this scope, it is included the design and turnkey supply of:

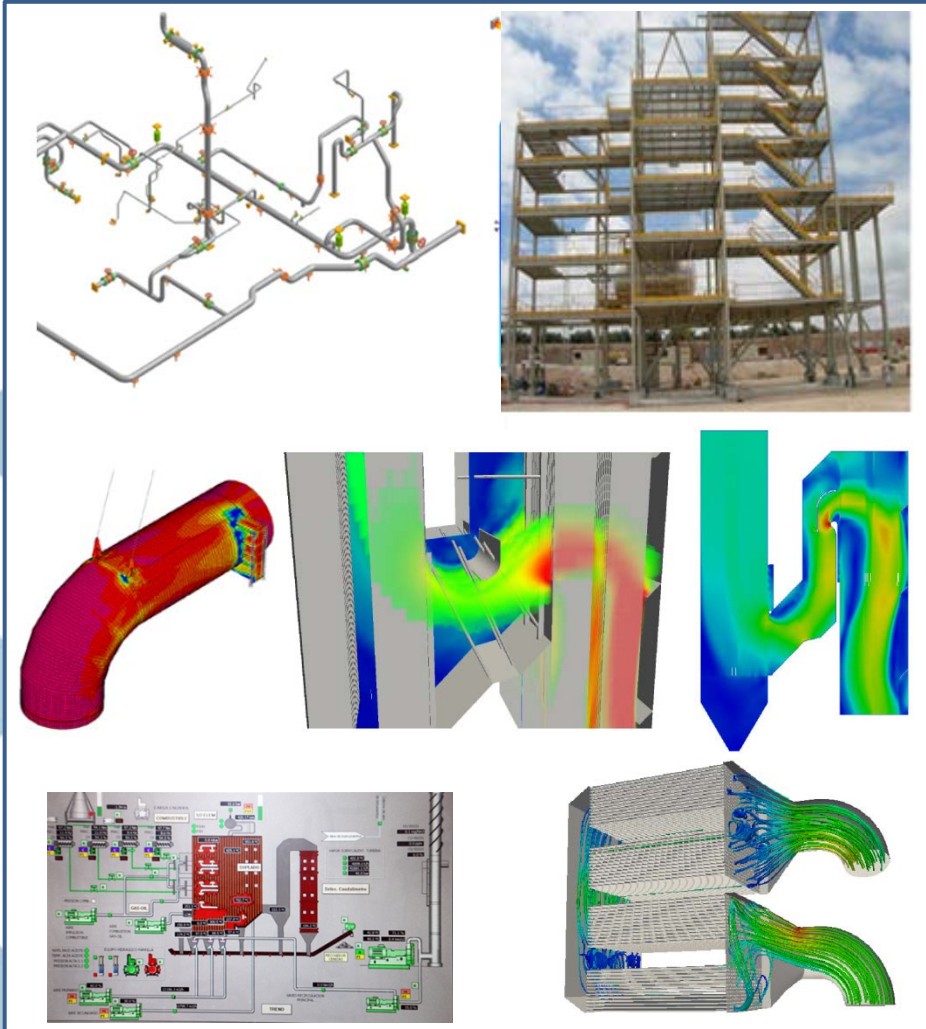
- Electric power generation plants:
 - ✓ Conventional fuels.
 - ✓ Biomass.
 - ✓ Solid urban wastes.
- Steam Boilers:
 - ✓ Conventional fuels.
 - ✓ Biomass.
 - ✓ Solid Urban wastes incinerators.
 - ✓ Recovery. (HRSG)
- Compact Electric Biomass Power Plants (BIOBLOCK®).
- Hybrid biomass/solar plants and solar/cogeneration plants.
- Piping, supports and stress on pipes and ducts.
- Thermal equipment:
 - ✓ Shell and tube heat exchangers.
 - ✓ Condensers.
 - ✓ Pre-heaters (high and low pressure).
 - ✓ Reboilers.
 - ✓ Economisers, evaporators and superheaters for CSP.
- Mechanical design, development and construction of components for chemical industry, petrochemical and food industry. (columns, reactors, steam accumulators etc.)



3. Products and services

But **Gestamp Biomass Solutions** is also defined as a Thermal Engineering Company. Within this scope, it is included the design and turnkey supply of: (continue)

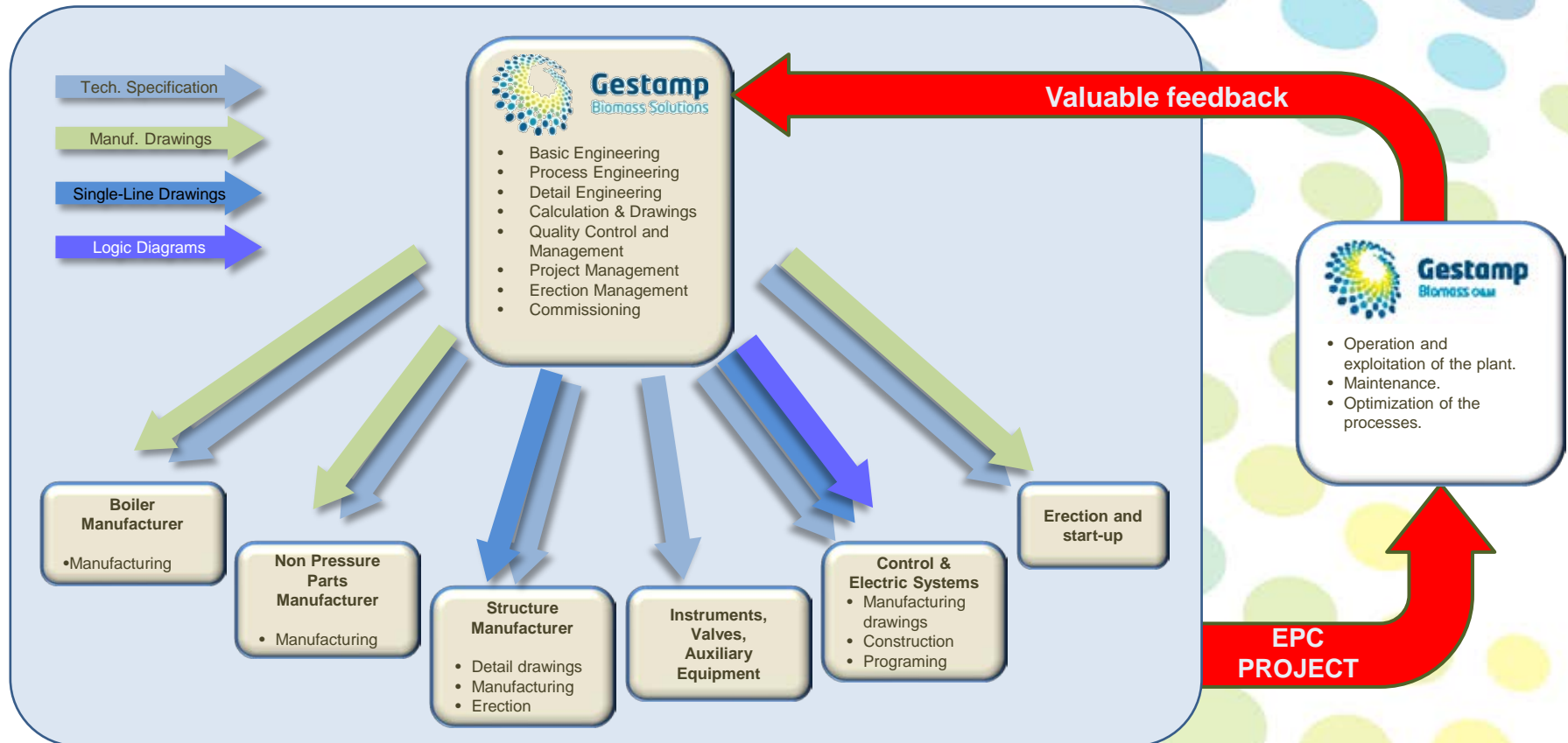
- Services y aftersales:
 - ✓ Combustion specialized consulting.
 - ✓ Boiler transformation to other fuels.
 - ✓ Boilers revamping y transformations.
 - ✓ Fault diagnosis
 - ✓ Energy plant process automation: combustion and boilers in general. Logics definitions and integration.
 - ✓ Boilers and other installations energy efficiency.
 - ✓ Co-combustion.
- O&M
- Design and calculation of industrial metallic structures.
- Finite element calculations, studies and simulations (stress and heat transfer) as well as CFD (Computational Fluid Dynamic) simulations (flux distribution, heat exchange, chemical reactions, particle transport etc.)



5. Way of working towards success

Apart from technical abilities and know-how, **Gestamp Biomass Solutions** has a trustworthy provider network. This make possible to focus efforts to engineering, fine design, etc in order to achieve the success of the projects.

Additionally, the horizontal integration with other subsidiary companies of the group provides a valuable and updated feedback which boost up the improvements in our designs.



6. References



| | |
|---|---|
| Project | Thermal Power Station for extractive industry "Hermanos de Santamaría Muñoz e hijos S.L." |
| Place | Córdoba - Spain |
| Electrical power | - |
| Fuel | Olive mill residues |
| Steam production | 12 T/h |
| Superheated steam outlet pressure | 15 bar |
| Superheated steam outlet temperature | 325 °C |
| Year | 2000 |

6. References



| | |
|---|--|
| Project | Thermal Power Station for oil extraction industry "El Tejar – Algodonales" |
| Place | Cádiz - Spain |
| Electrical power | 5,7 MWe |
| Fuel | Olive mill residues |
| Steam production | 28 T/h |
| Superheated steam outlet pressure | 62 bar |
| Superheated steam outlet temperature | 450 °C |
| Year | 2000 |

6. References



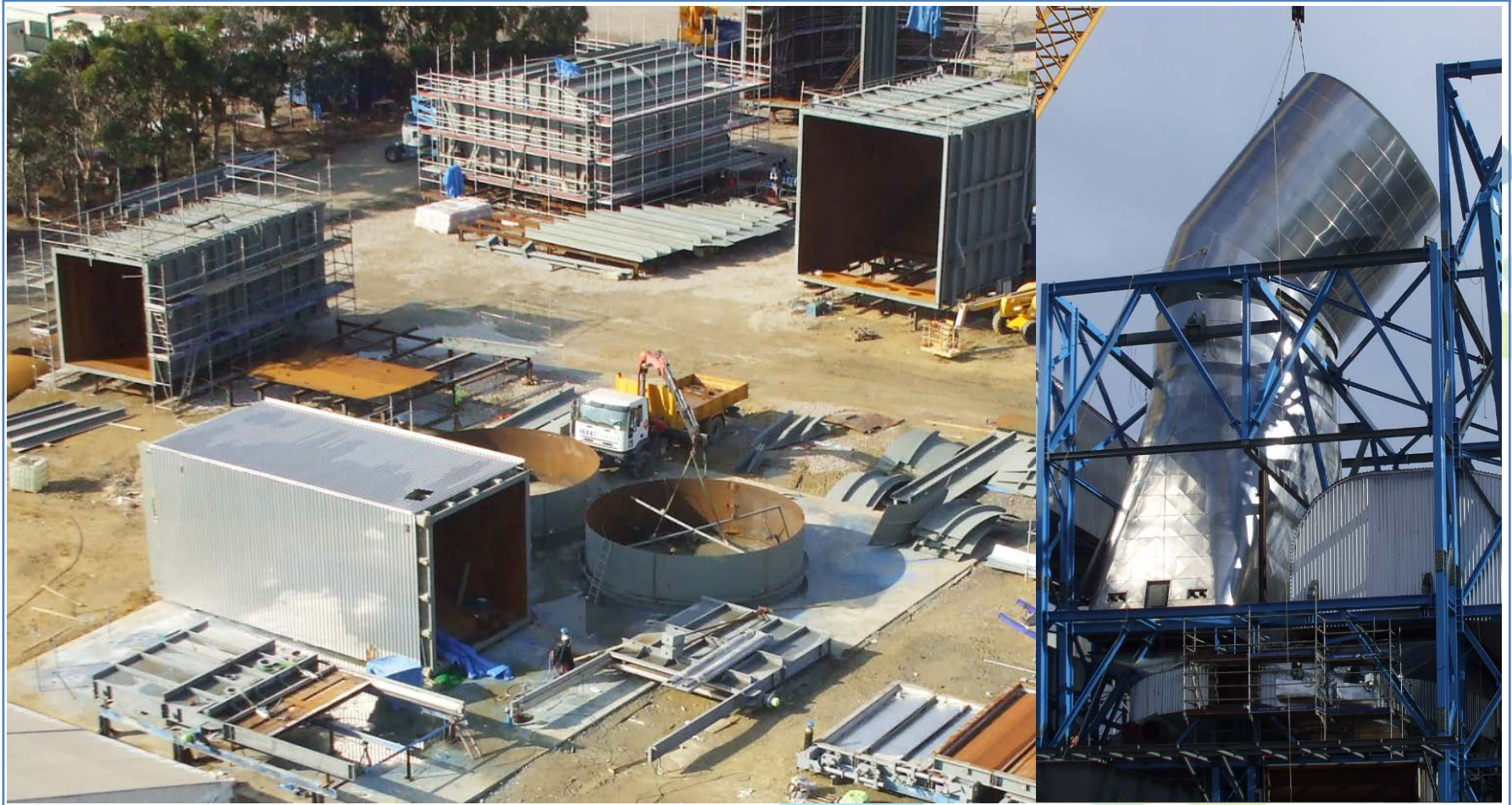
| | |
|---|---|
| Project | Thermal Power Station for Olive Industry "Fuente de Piedra" |
| Place | Málaga - Spain |
| Electrical power | 8 MWe |
| Fuel | Olive mill residues |
| Steam production | 35 T/h |
| Superheated steam outlet pressure | 63 bar |
| Superheated steam outlet temperature | 400 °C |
| Year | 2002 |

6. References



| | |
|---|---|
| Project | Biomass Thermal Power Station of Puente Genil |
| Place | Córdoba - Spain |
| Electrical power | 9 MWe |
| Fuel | Olive mill solid waste, olive-tree pruning and cotton bush. |
| Steam production | 41,6 T/h |
| Superheated steam outlet pressure | 42 bar (a) |
| Superheated steam outlet temperature | 403 °C |
| Year | 2005 |

6. References



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|----------------|--|
| Project | Desulfurization plant: flue gases ducts and supports structures engineering and drawings development |
| Place | Los Barrios (Cádiz) – Spain |
| Year | 2006 |

6. References



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|---|---|
| Project | Linares Bioelectrical Company |
| Place | Linares (Jaén-Spain) |
| Electrical power | 15 MWe |
| Fuel | Olive mill solid waste and olive-tree pruning |
| Steam production | 69 T/h |
| Superheated steam outlet pressure | 42 bar (a) |
| Superheated steam outlet temperature | 403 °C |
| Year | 2007 |

6. References



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|---|---------------------------------|
| Project | Heavy fuel-oil boiler revamping |
| Place | Nicarao (Cuba) |
| Electrical power | - |
| Fuel | Heavy fuel-oil |
| Steam production | 100 T/h |
| Superheated steam outlet pressure | 16 bar |
| Superheated steam outlet temperature | 300 °C |
| Year | 2008 |

6. References



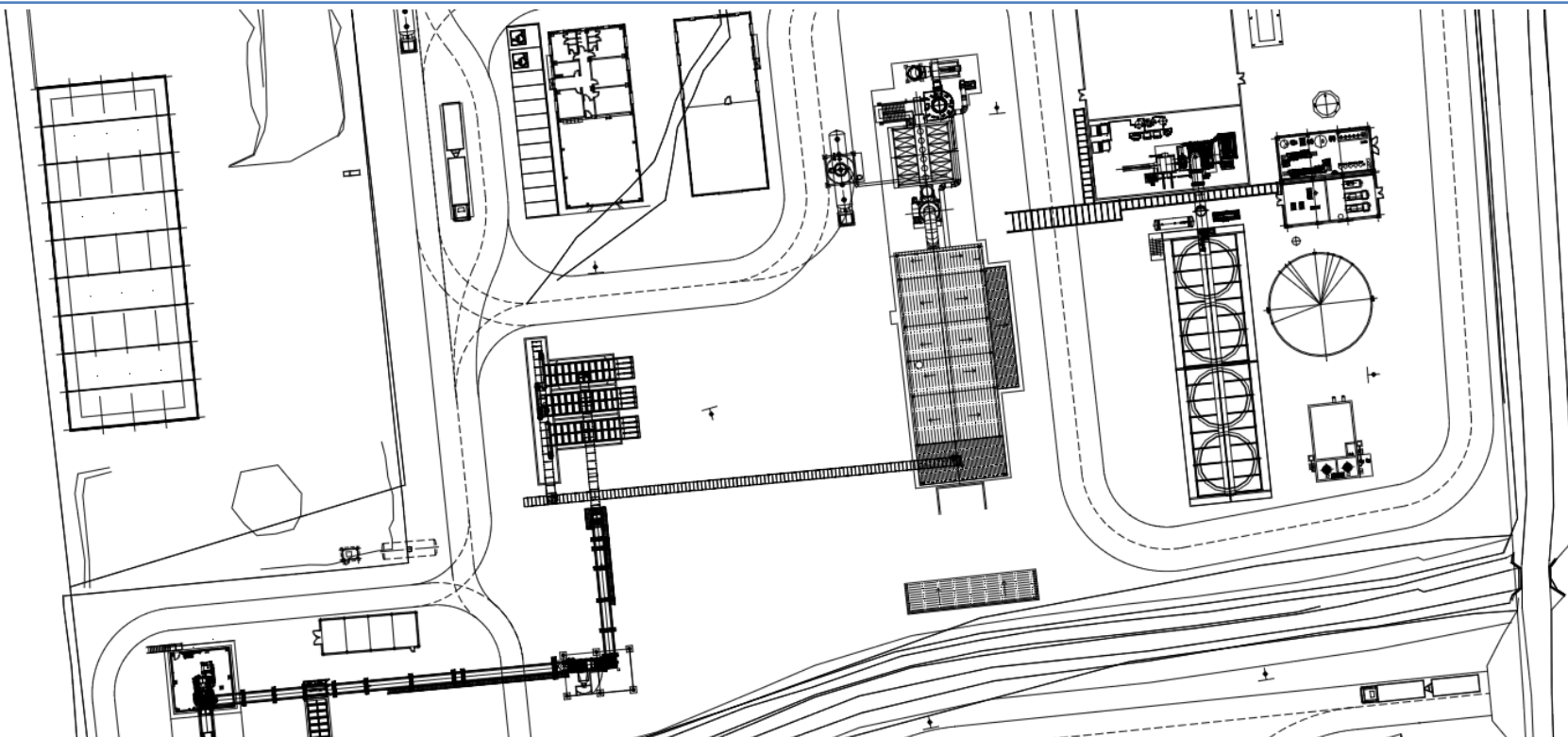
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|---|---|
| Project | 20 MWth Oxy-combustion pulverized coal boiler |
| Place | CIUDEN (Ponferrada- Spain) |
| Electrical power | - |
| Fuel | Pulverized coal |
| Steam production | 26,2 Tn/h |
| Superheated steam outlet pressure | 30 bar |
| Superheated steam outlet temperature | 420 °C |
| Year | 2010 |

6. References



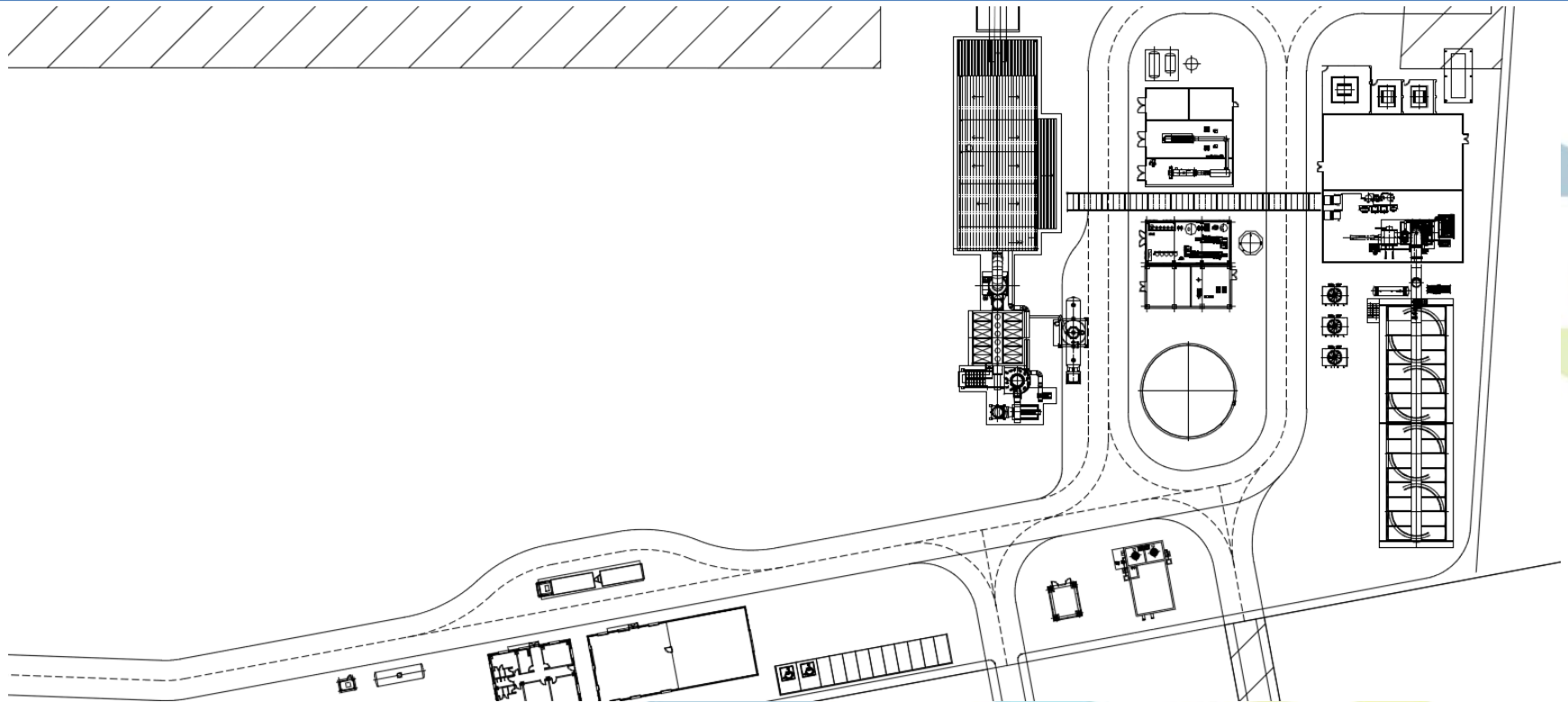
| | |
|---|--------------------------------|
| Project | 15 MWe Biomass Boiler |
| Place | Soria (Garray- Spain) |
| Electrical power | 15 MWe |
| Fuel | Clean wood and forest residues |
| Steam production | 58,5 Tn/h |
| Superheated steam outlet pressure | 93 bar |
| Superheated steam outlet temperature | 487 °C |
| Year | 2012 |

6. References



| | |
|---|---|
| Project | 15 MWe Biomass Boiler |
| Place | Piedrabuena (Ciudad Real Spain - Spain) |
| Electrical power | 15 Mwe |
| Fuel | Forest residues |
| Steam production | 56,4 Tn/h |
| Superheated steam outlet pressure | 82 bar |
| Superheated steam outlet temperature | 488 °C |
| Year | 2016 |

6. References



| | |
|---|------------------------------|
| Project | 15 MWe Biomass Boiler |
| Place | Torredonjimeno (Jaen- Spain) |
| Electrical power | 15 Mwe |
| Fuel | Forest wood |
| Steam production | 49,7 Tn/h |
| Superheated steam outlet pressure | 81 bar |
| Superheated steam outlet temperature | 488 °C |
| Year | 2016 |

THANKS FOR YOUR ATTENTION



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