

PROJECT PROFILE: CFB, France

# Gardanne

Coal to biomass conversion



Doosan Lentjes is delivering key CFB boiler technology and a flue gas cleaning system for E.ON's major biomass conversion and turbine upgrade project at Gardanne in Provence, France.

## DELIVERABLES

- CFB boiler conversion
- New flue gas cleaning system
- Plant life extension
- Turbine retrofit

## CHALLENGES

- Scale down from 250MWe to 170MWe
- Design to 100% biomass and to co-combustion of discard coal
- Design of flue gas treatment to reduce trace metals and trace organic compounds
- Lifetime extension of Boiler and Steam Turbine/ Generator under operation since 1995

## BENEFITS

- An important contribution to the E.ON Group's cleaner, higher performance energy strategy
- 170 MWe of power with base production of more than 7,500 hours per year - corresponding to the annual electrical consumption of 440,000 households
- Reduction of CO<sub>2</sub> balance by 600,000 tons per year
- Plant life-time extension of 20 years
- Solution from one trusted source

# CFB technology to generate cleaner electricity

The contract for the major biomass conversion and turbine upgrade project for E.ON's coal-fired Provence power plant in Gardanne, France, was awarded in 2013. Once complete, Gardanne will become France's largest biomass-fired power plant.

The new biomass unit will be converted from the existing coal-fired Provence 4 unit. It will provide up to 170 MWe of power with base

production of more than 7,500 hours per year until 2034, which corresponds to the annual electrical consumption of 440,000 households. The investment will reduce the CO<sub>2</sub> balance by 600,000 tons per year.



## Key Project Data

<b>Customer</b>	Societe Nationale d'Electricite et de Thermique (E.ON France)
<b>Location of power plant</b>	Gardanne, Provence, France
<b>Main project partner</b>	Doosan Babcock
<b>Main fuels</b>	Biomass, waste wood (11%-th), discard coal (13%-th)
<b>Award date</b>	2013
<b>Number of lines</b>	1
<b>Plant output</b>	170 MWe
<b>Thermal capacity</b>	386 MWth
<b>Superheater outlet pressure</b>	165 bar-g
<b>Live steam</b>	441 t/h; 566/ 165 °C / bar
<b>Reheat steam</b>	406 t/h; 565/ 33 °C / bar
<b>Process steam</b>	10 t/h; 345/ 34 °C / bar
<b>Feed water</b>	433 t/h; 244 °C
<b>Design fuel</b>	LHV 12MJ/ kg Ash 10.4% Moisture 33.1% Sulphur 0.11%
<b>Emissions (acc. to 6% O<sub>2</sub>, dry, monthly av.)</b>	SO <sub>2</sub> 150 mg/ m <sup>3</sup> (STP) NO <sub>x</sub> 150 mg/ m <sup>3</sup> (STP) Duŝt 19 mg/ m <sup>3</sup> (STP)
<b>Thermal efficiency</b>	90%
<b>Turbine</b>	Four-body turbine, 1 HP, 1 IP, 2 LP stages



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Doosan Lentjes is a global provider of processes and technologies for energy production from renewable and fossil fuels. Our specific areas of expertise include circulating fluidised bed boilers, key technology for the generation of energy from waste, and flue gas cleaning systems. We have been pioneering energy solutions for 90 years and convert over 9 million tonnes of waste into energy each year.

Doosan Lentjes is part of a powerful combination of companies united under the Doosan Group to deliver complementary technologies, skills and value to customers the world over.

Doosan Babcock

Doosan Lentjes

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