

MAN Diesel & Turbo's Biofuel Plant

“Renewable-in, renewable-out”



Executive summary

New incentives meant that Italian company Cereal Docks was looking to use biofuels as a source of power. Using highly reliable large medium-speed engines, MAN Diesel & Turbo provided a cost-effective solution that not only uses biofuels – it also helps to produce them.

Challenge

After Italy introduced incentives for CO₂-neutral and renewable fuels in 2008, biofuels suddenly became an attractive option for power producers and other industries. However, these substances can cause considerable problems in high-speed engines. To take advantage of the new subsidies, Cereal Docks, an animal feed company, would need the right technology.

Solution

Seeking a new electrical cogeneration plant at Camisano Vicentino, in northern Italy, Cereal Docks turned to an experienced team. Together with its specialist partner, Termoinindustriale SpA, MAN Diesel & Turbo is behind a number of major biofuel

cogeneration projects in Italy, with a combined output of 40 MW.

For Cereal Docks, MAN Diesel & Turbo supplied two generator sets powered by MAN nine-cylinder type 9L27/38 engines. As with other MAN large medium-speed engines designed for heavy fuel oils, these engines run safely on biofuels. Readily available and cost-effective, palm oil was chosen for the Cereal Docks plant, with rapeseed oil for engine start-up and shut-down. The generators operate parallel to the grid in base load mode.

To ensure maximum efficiency, the new cogeneration plant harnesses the heat given off by the engines. In addition to 5.2 MW of electrical energy, the plant also produces 4.7 MW of thermal energy. This is used to produce a further CO₂ neutral renewable fuel, in what is known as “renewable-in, renewable-out” – a feature of many of MAN Diesel & Turbo's projects. Steam from the engines' exhaust goes towards the manufacture of biodiesel at a nearby facility – also run by Cereal Docks.



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Power house at the Cereal Docks works in Camisano Vicentino in northern Italy. Cooling radiators are located on the power house roof



Recovered heat is used in an adjacent bio-diesel plant

What's more, the plant is equipped with selective catalytic reduction, which cuts nitrogen oxide (NO_x) emissions. In fact, all plants built by MAN and Termindustriale include this environmentally-friendly technology.

Benefits

Unlike sensitive high-speed engines, MAN Diesel & Turbo's famously robust large medium speed engines operate reliably and efficiently on a range of biofuels. So Cereal Docks received a solution that was at the cutting edge of power generation – yet based on tried and tested technology, ensuring high uptime and low maintenance.

MAN Diesel & Turbo large medium-speed engines offer another key advantage: fuel flexibility. Although currently running on palm oil, the plant's engines can be switched to jatropha oil blends if these become available.

By deploying cogeneration, Cereal Docks obtains thermal as well as electrical power, at minimal ongoing cost. In other words, this is an investment that pays for itself twice over. And as that extra energy is used to produce a renewable fuel, the plant also delivers added environmental benefits.

Project data

Outputs:	5.2 MW electrical 4.7 MW thermal
Overall efficiency:	80%
Gensets:	2 x 2.6 MW _e (based on MAN Diesel & Turbo four-stroke type 9L27/38 diesel engines)
Intended fuel:	Palm oil or Jatropha oil
Recovered heat utilization:	Process heat for bio-diesel production
Order:	09-2006
Taking over:	11-2007
Country:	Italy

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