

MAN Diesel & Turbo Converts Waste

A highly efficient cogeneration plant



Executive summary

Working closely with a local government agency in Fritzens, in the Austrian Tyrol region, MAN Diesel & Turbo has delivered an innovative solution that meets multiple needs – combining waste disposal and highly-efficient combined heat and power generation.

Challenge

Abwasserverband Hall, the waste water utility in Fritzens, Austria, had a problem: its sewerage pipes were regularly being blocked by solidified oil. Households and eateries were simply pouring their used cooking oil and fat down the drain. Clearing these blockages cost an estimated 400 € per ton of oil.

Solution

Now, residents and restaurants in the area collect their used cooking oil in resealable, reusable plastic containers supplied to them by Abwasserverband Hall. From here, the oil goes to the local garbage disposal and sewage works. But, thanks to a pioneering solution from MAN Diesel & Turbo, it doesn't go to waste.

After being stored in a settling tank – to remove food residue – the oil is heated and filtered. Then, it fuels a MAN L21/31 large medium speed waste oil engine, which is used to generate electricity. The sediment collected from the settling process is also put to use: with other waste, it is fermented in sewage digesters.

For maximum efficiency, the exhaust heat given off by the engines is also harnessed. The heat from the gas engines is used to accelerate the fermentation process, while thermal energy from the waste oil engine heats the building and dries sewage sludge. This produces a granulated combustible material: another renewable fuel.

And to keep emissions down, the 1,130 kW plant is fitted with a selective catalytic reduction (SCR) system. A subsequent oxidation catalyst removes any possible ammonia slip.



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Benefits

This unusual plant has been operating successfully since 2004.

Around 1,800 tons of old oil and fat are collected each year – enough to supply around 3,500 households with electricity. Under Austrian legislation, this electricity is sold to the grid at preferential rates.

What's more, the additional thermal energy completely covers the needs of the sludge-drying process. The fuel made from the sludge is used to power a nearby cement works – compounding the fossil fuel savings.

Despite the acid content of the waste oil, the L21/31 engine continues to perform reliably. MAN Diesel & Turbo has found that the injection pumps are achieving satisfactory times between overhaul – proof positive that MAN's robust large medium speed engines can run on all sorts of fuel.

And the environmental benefits have also been proven.

Independent monitoring by TÜV (an organisation that provides technical inspections) shows the emissions of the waste oil engine are well within regulatory limits. In fact, the engine produces very low particulate emissions, due to the high oxygen content of the cooking oil.

So, with the help of MAN, Abwasserverband Hall has turned its cooking oil problem into a money-spinner – and an environmentally-friendly one at that.

Project data

Outputs:	1.13 MW electrical 1.34 MW thermal Generator
Overall efficiency:	88%
GenSet:	1 x 6L21/31
Fuel:	Used cooking oils and fats
Fuel conditioning:	Heating, separation, filtration
Recovered heat utilization:	Space heating, acceleration of sewage digestion, drying of sewage sludge
Order:	10-2003
Taking over:	05-2004
Country:	Austria

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