

## „The plant’s efficiency allows us to produce more than 1.5 times our own electrical requirement“

Wastewater treatment is an energy-intensive business – in the past, sewage plants used to take up the largest share of municipalities’ electricity demand. Today, combined heat and power plants for power generation have practically become standard equipment within wastewater treatment plants. The Weinheim Wastewater Treatment Plant in the Bergstrasse Wastewater Utility District is no exception in this regard. Located just outside the city of Weinheim an der Bergstrasse, the wastewater treatment plant, commissioned in 1977 and completely overhauled in 1993, produces electricity from sewage gas with two MWM cogeneration power plants. „With our particularly efficient and continuously optimized plant, we produce not only our complete annual plant requirement for electricity, but we can also feed up to 1,800 MWh back into the public grid,“ as Manuel Ritter, manager of the wastewater treatment plant, proudly explains. At the age of 24, Manuel Ritter is Germany’s youngest sewage plant manager, already earning his master craftsman’s certificate at 22.

Bergstrasse Wastewater Utility District encompasses the Hessian and Baden-Wuerttemberg communities of Weinheim, Viernheim, Birkenau, Hemsbach, Hirschberg, Laudenbach, along with the „Grundelbachtal“ Waste Water Utility. Currently the wastewater from some 170,000 people is biologically treated and cleaned in the Weinheim wastewater treatment plant. The system is designed for a wastewater treatment capacity of 230,000 to 240,000 inhabitants. Depending upon rainfall, the plant processes between 20,000 and 130,000 m<sup>3</sup> of



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wastewater per day, producing up to 7t of fermentation sludge daily as a byproduct of water treatment. The fermentation tanks, a typical visual characteristic of wastewater treatment plants, generate roughly 2,400,000 m<sup>3</sup> of fermentation gas per year. „Our plant is designed to achieve an extremely high gas yield during the fermentation process – we increase the efficiency through filtering and drying,“ says the plant manager, illustrating the sewage plant’s energy efficiency.

## „There has been seamless cooperation with MWM in nearby Mannheim dating all the way back to the 1970s“



Manuel Ritter, manager of the wastewater treatment plant Bergstraße e.V.

„Thus far, we have been operating two cogeneration systems, each equipped with a 400 kWel and a 600 kWel genset from MWM. A third CHP plant with an additional 600 kW from the Mannheim company is currently under construction and is expected to be ready for operation at the end of 2014,“ explains Manuel Ritter. „It will enable us to cover our own electricity requirement and simultaneously use the heat generated for the heating of our buildings and of fermentation towers that require a temperature of 37°C for the fermentation processes.“

The gas gensets of the cogeneration systems in the Bergstrasse Wastewater Utility District reach some 7,500 annual operating hours. The third CHP plant currently under construction is a redundancy unit, as the failure of a CHP plant would result in unnecessary energy costs. With the third MWM TCG 2016V 12 series genset, a high-performance system is available as a „standby CHP plant.“ Since the commissioning of the sewage plant in 1977, there has been seamless cooperation between the wastewater utility district and the Mannheim-based gas engine manufacturer.

## „For the future, we are planning to implement online management for our three CHP plants“



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### Weinheim Wastewater Treatment Plant, Bergstrasse Waste Water Utility District Weinheim/Bergstrasse, Germany

<b>Contact</b>	Hubert Ensinger, CEO
<b>City</b>	Weinheim/Bergstraße
<b>Country</b>	Germany
<b>Employees</b>	53
<b>Wastewater volumes</b>	20,000-130,000 m <sup>3</sup> /day 12,000,000-18,500,000 m <sup>3</sup> /year
<b>Fermentation sludge</b>	approx. 7 t/d (solid)
<b>Fermentation tanks</b>	3 fermentation tanks, 4,700 m <sup>3</sup> each
<b>Gas production</b>	approx. 2,400,000 m <sup>3</sup> /year
<b>Power production</b>	approx. 5,600,000 kWh/year, equivalent to approx. 147% of the plant's own requirement
<b>Heat output</b>	approx. 5,340,000 kWh/year
<b>Commissioning of the sewage plant</b>	1977

### Technical specifications for CHP plants

<b>Commissioning of the gensets</b>	2006 (400 kW), 2011 (600 kW), end of 2014 (600 kW)
<b>Engine type</b>	1 x MWM TBG 2016 V12 K – 400 kWel 2 x MWM TCG 2016 V12 C – 600 kWel
<b>Generator</b>	FKI Energy Technology M8B 400 LA4; Marelli MJB 400 CA4B24
<b>Electrical output</b>	1 x 400 kW, 2 x 600 kW
<b>Electrical efficiency</b>	approx. 42.5%
<b>Thermal efficiency</b>	approx. 40.5%
<b>Overall efficiency</b>	approx. 83.0%

### Details

In addition to the CHP plants, the Weinheim Wastewater Treatment Plant has over 5,000 m<sup>2</sup> of photovoltaic panels installed on the roof tops of the buildings, yielding up to 560,000 kWh/year. Together with the cogeneration power plants, they produce up to 162% of the plant's own electricity requirement.

In case of a power outage, emergency power supplies keep the wastewater treatment plant running.

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