

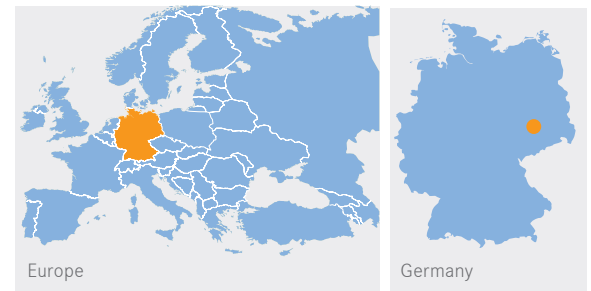
COMBINED HEAT AND POWER WITH BIOGAS

WESTEWITZ: FROM FARM TO POWER PLANT

COMBINED HEAT AND POWER PLANT SUPPLIES LOCAL HOSPITAL WITH BIO-HEAT



- // **Who:** The Krawczyk family, private operators
- // **What:** CHP Module GC 350 B5
- // **Where:** Westewitz, Germany



The combined heat and power plant in Westewitz covers all the base-load heating needs of the nearby Bethany Hospital. It's a win-win situation for all concerned: the hospital enjoys much cheaper heating than before and the CHP plant operators can market the heat they produce as well as the electricity they generate.

Westewitz, Germany – The small village of Westewitz in Saxony is home to the Krawczyk family and their farm. It is where the head of the family, Volkmar, and his two sons, Thorsten and Sven, cultivate 700 hectares of land and keep 300 head of cattle. The Krawczyks first started to think about biogas several years ago as a way of putting the farm's organic waste to efficient use.

After thinking long and hard about the best approach to adopt and after weighing up the financial risks, the Krawczyks made their decision: they invited the environmental technology company U.T.S. (Umwelt-Technik-Süd GmbH) to set up a "showcase" biogas plant in Westewitz and at the end of 2004, the plant went into operation.

It consists of a preliminary tank for liquid manure and sewage, two fermenters each holding 1,350 m³ and a secondary fermentation tank (2,000 m³) which also functions as a gas storage unit. 60 m³ of liquid manure and 25 metric tons of solid waste are fed into the fermenters every day.

Under the German Renewable Energy Act (EEG), that means that the plant operators not only earn basic rate payment for their electricity, they also receive an additional bonus for using exclusively liquid manure and renewables. Since the end of 2005, the plant's powerhouse has been occupied by two biogas combined heat and power modules supplied by MTU Onsite Energy which were installed to replace original plant manufactured by a different company.

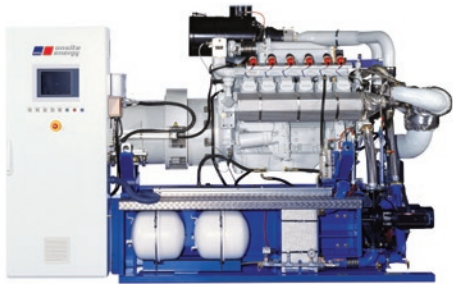
Each of the Type GC 350 B5 CHP modules is powered by a 12-cylinder gas engine and each produces 350 kilowatts of electrical power as well as 475 kilowatts of thermal energy. Both modules are monitored by the MTU Module Control (MMC), which incorporates vital plant control elements and serves the CHP plants' auxiliary drives.

Showcase Project: Westewitz

Biogas plant operators often concentrate exclusively on the electricity generated because poten-



The Krawczyk family is pleased: In addition to the basic rate payments for the electricity produced by their biogas plant, Thorsten, Sven and their father Volkmar earn an additional bonus for using exclusively liquid manure and renewables.



Two CHP modules of the Type GC 350 B5 from MTU Onsite Energy deliver power and heat to the nearby Bethany Hospital.

tial consumers for the additional heat available are simply too far away. Not so in Westewitz. Here, the thermal energy potential can be utilized to the full. In this case, the customer for the heating power is a specialist psychiatric and psychotherapy hospital with residential and care facilities, which is located in the immediate vicinity of the biogas plant. The hospital uses the thermal energy to cover a large part of its base-load requirement. By fully utilizing its thermal energy recovery potential, the CHP plant achieves outstanding total efficiency of almost 90 percent.

The plant's excellent performance has also come in for recognition by various institutions and higher education bodies which make use of it for de-mostration and research purposes. Frequent visitors include specialists from the Fraunhofer Institute as well as teachers and students from the Technical University of Dresden. School classes, politicians and farmers with an interest in the field also pay regular visits to the unit.

But it is not only research carried out by the Fraunhofer Institute and the TU Dresden which contribute to the ongoing development of the plant. Mr. Krawczyk and his sons also have a keen interest in introducing improvements on a continuous basis. Expansion of the plant is already on the cards and in the next development phase, the present secondary fermentation

tank is scheduled for use as an additional fermenter. A new final storage unit will replace the secondary fermenter. A third CHP module from MTU Onsite Energy is also planned for the powerhouse and the additional thermal energy will be used by the hospital and a canteen kitchen planned for the area. The substrates needed to fuel the expansion will be produced on 700 hectares of land which is now available to the Krawczyks for cultivation. As the family's plans for expansion demonstrate, the biogas plant has now become another solid cornerstone for future development.

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MTU Onsite Energy is the brand name under which the Tognum Group markets distributed power generation systems. The product range encompasses standardized and customized diesel generator sets for emergency stand-by, base and peak load applications based on diesel engines rated up to 3,250 kW as well as compact cogeneration modules powered by gas engines with up to 2,150 kW or gas turbines up to 45,000 kW for the generation of both heat and power.

