Göppingen
Energetic

Waste is a valuable source of energy. The energy from waste has been recycled in the plants of the EEW-Energy-from-Waste Group (EEW) for more than 40 years now and used to generate environmentally friendly power, district heating and process steam.

At the same time thermal waste recycling is a supporting pillar of a modern, sustainable waste-disposal economy. EEW guarantees this to its partners and customers.

For this reason EEW develops, constructs and runs waste-incineration plants of a high technical and ecological standard and thereby makes an important contribution to the environment and to climate protection.

A hiker’s paradise

The EEW Energy from Waste Göppingen location is to be found embedded in the attractive landscape of the Swabian Alb. The surroundings are a true paradise for hikers and lovers of nature.

Aware of its special responsibility, the location has represented an important building block in environmentally friendly waste disposal for the town of Göppingen and its environs since 1975. In 1998 a new furnace and a highly modern flue gas cleansing system were installed in the plant. Around 155,000 tons of residual waste from the district of Göppingen and further quantities from Baden-Württemberg are thermally recycled here every year. The electrical energy generated from it is fed into the local grid.

In addition the plant generates district heat with which the clinic am Eichert, the residential area Bergfeld with around 400 flats and the neighbouring stand-by police station are supplied.
Everything at a glance

1 Delivery
2 Waste Bunker
3 Incineration Grates
4 Wet Deasher
5 Slag Bunker
6 Furnace
7 Turbine
8 Air-cooled Condenser
9 District Heat
10 Gearbox
11 Generator
12 Transformer
13 Spray Dryer
14 Bag Filter
15 HCl Wet Scrub
16 SO₂ Wet Scrub
17 Washer Pump
18 Induced Draught Fan
19 Catalytic Converter
20 Filter Layer Adsorber
21 Chimney

Supplementary Data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Put into operation</td>
<td>1975</td>
</tr>
<tr>
<td>Replacement line put into</td>
<td>1998</td>
</tr>
<tr>
<td>operation</td>
<td></td>
</tr>
<tr>
<td>Total investments</td>
<td>75 million euros</td>
</tr>
<tr>
<td>Capacity</td>
<td>155,000 tons/year</td>
</tr>
<tr>
<td>No. of incineration lines</td>
<td>1</td>
</tr>
<tr>
<td>Waste storage volume</td>
<td>3,000 cubic metres ≈ 2,500 tons</td>
</tr>
<tr>
<td>Heat Range for the Waste</td>
<td>9-11 megajoules/kilogram</td>
</tr>
<tr>
<td>Combustion Temperature</td>
<td>&gt; 850-1000 °C</td>
</tr>
<tr>
<td>Power production</td>
<td>63,000 megawatt hours</td>
</tr>
<tr>
<td></td>
<td>≈ 17,000 households</td>
</tr>
<tr>
<td>District heat production</td>
<td>55,000 megawatt hours</td>
</tr>
</tbody>
</table>
Residual waste turns into energy

Every day up to 600 tons of waste are brought to the EEW Göppingen plant where it is collected and placed in interim storage in the waste bunker. Up to 2,500 tons of this “fuel” can be stored in the bunker. This corresponds to the loads of around 500 garbage vehicles. It ensures continuous operation even at the weekend or on official holidays.

The employees stir the waste with the help of two crane claws to create a homogeneous mix. Only by continuously stirring the different proportions of household and commercial waste is an even incineration process guaranteed. The heat value lies between 9,000 and 11,000 kilojoules per kilogram.

To ensure that no smells can escape into the air a slight underpressure is maintained in the bunker. This is created by suctioning air from the bunker for purposes of combustion.

The prepared waste is transferred from the bunker via the feeding hopper to the incineration grate for the line. Once ignited the waste material automatically continues to burn. The fire has a temperature of more than 850 °C. With this heat energy in the furnace around 64 tons of steam per hour are produced. With a pressure of 41 bar and a temperature of 400 °C this steam drives a turbine connected to a generator. In this way the plant produces 63,000 megawatt hours of electricity and can therefore meet the requirements of approximately 17,000 households.

At the same time Göppingen produces up to 55,000 megawatt hours of district heat by means of energy-efficient cogeneration.

The operation of the plant represents an alternative to an annual energy production based on the use of more than five million litres of heating oil.
Environment protection right from the start

Environmental protection is already applied at the furnace-burning stage. Pollutants contained in the waste, such as dioxin and furans, must be fully destroyed. This is ensured by a minimum temperature of 850 °C. At the same time the levels of carbon monoxide and nitrogen oxide are reduced.

With a temperature of 230 °C the flue gases leave the furnace and then undergo six further stages of flue-gas cleansing during which other pollutants are reduced to a minimum. The flue gas is cooled down to 180 °C in the spray dryer. For this purpose neutralised wash water from the flue gas washers is used which is vaporised again. The salts dissolved in the liquid crystallize as solids.

Next comes the bag filter where these solids are filtered out. At the same time most of the heavy metal compounds are removed. Then the flue gas passes through the two wet scrubs. In the first heavily acidic scrub, hydrogen chloride and hydrogen fluoride compounds are bound by adding hydrated lime. The second wet scrub is only slightly acidic and its purpose is principally to remove sulphur dioxide from the flue gas. This is also done by adding hydrated lime.

No chance for pollutants

The flue gases are further cleansed by means of a fine injection of ammonia water. As a result the nitrogen oxides are split into environmentally neutral nitrogen and water in the catalytic converter.

Then the flue gas is enriched with a mixture of hydrated lime and activated carbon in order to bind the residual pollutants. The solids are then caught in the filter layer adsorber. The cleansed flue gas then leaves the almost 100 metre high chimney.

What remains is slag, flue ash and filtration dust. The slag is recovered and used for roads and civil engineering projects. The same applies to the flue ash and the filter dust.

The Göppingen location is a plant which produces no waste water. The wash water from the flue gas cleansing process is used in the spray dryer to cool the flue gases. Rainwater is also collected and used as service water.
Strict specifications

Thermal waste recycling is currently the most environment-friendly form of waste disposal.

By using waste as fuel, emissions of carbon dioxide are reduced in the EEW Göppingen plant alone by some 4,000 tons a year - as compared to power production in conventional brown coal-fired power plants.

The specified emission limits are particularly strict due to the plant’s proximity to the Swabian Alb conservation area. The Göppingen location guarantees adherence to the 17th “Bundesemissionsschutzverordnung” [Federal Emission Control Ordinance] and it lies around 90 percent below the limits set for all pollutants. Emissions are continuously monitored and checked by Stuttgart regional council. In addition the current values are published on a board at the main gate.

Our Environmental Contribution

155,000 tons of waste per year disposed of cleanly

63,000 megawatt hours of power production per year

55,000 megawatt hours of district heat production per year

Power for 17,000 households

4,000 tons of CO₂ saved

Emission Data for EEW plant

Utilization value in percent

<table>
<thead>
<tr>
<th>Emission</th>
<th>Limit Values ¹</th>
<th>Operating Values for Göppingen</th>
</tr>
</thead>
<tbody>
<tr>
<td>nitrogen oxides</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>carbon monoxide</td>
<td>80%</td>
<td>0%</td>
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<tr>
<td>sulphur dioxide</td>
<td>60%</td>
<td>0%</td>
</tr>
<tr>
<td>hydrogen chloride</td>
<td>40%</td>
<td>0%</td>
</tr>
<tr>
<td>hydrogen fluoride</td>
<td>20%</td>
<td>0%</td>
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<tr>
<td>organic carbon compounds</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>dust</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>quicksilver</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>cadmium/thallium</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>total heavy metals</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>dioxins/furans</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

¹ In accordance with the 17th “Bundesemissionsschutzverordnung” (Federal Emission Control Ordinance) ² Operating values are below the detection limit
We hope that this flyer has made you curious to find out more. You are welcome to visit our plant. Please contact us under:

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Opening hours:
Monday to Friday: 7:30 a.m. until 5:00 p.m.
Saturday: 8:00 a.m. until 1:00 p.m.