# The Igelsta CHP Plant

## Södertälje, Botkyrka and Huddinge's biggest-ever green investment

Söderenergi

*Green power and heating for a sustainable society*

# Green power and heating for a sustainable societ

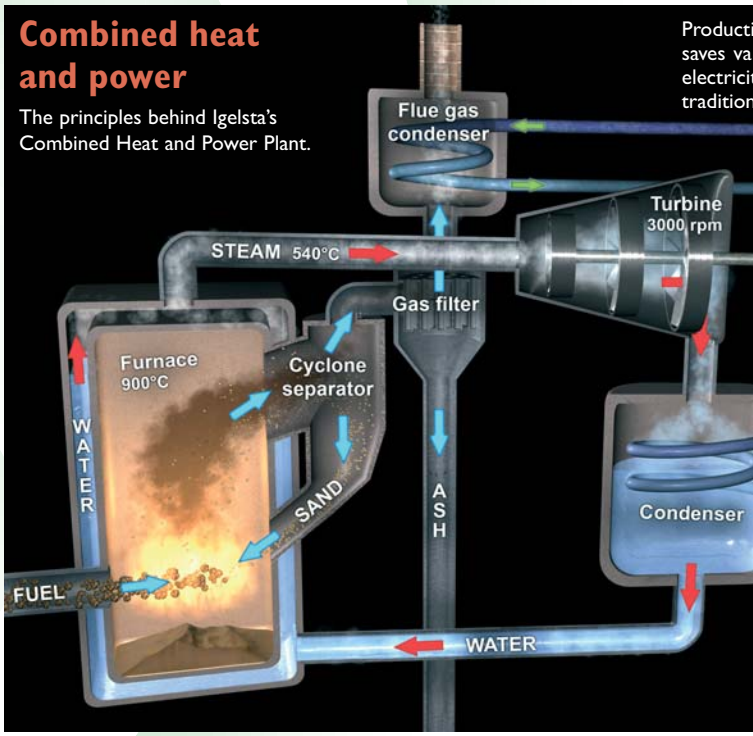
*The Igelsta combined heat and power (CHP) plant is Sweden's largest bio-fuelled co-generation plant. It also represents the biggest environmental investment ever made in the municipalities that own it: Södertälje, Botkyrka and Huddinge. The plant produces 200 MW of heat and 85 MW of electricity – enough to keep 50 000 private houses warm and power 100 000 homes.*

## Co-generation makes the most of resources

Co-generation is a resource-efficient technology (RET) for producing heat and power simultaneously. Heat is a by-product of power generation and often goes to waste. Exploiting it to heat homes and premises means using resources to the best advantage.

## Biofuels and recovered waste fuels

The CHP boiler is fired by biofuels and recovered waste fuels. When running at full capacity it uses approximately 17 000 tons of fuel per week. The principal fuel is forest waste, i.e. wood chips from branches and tops. A smaller share is waste fuel, of which Söderenergi has wide experience. This comprises quality-controlled scrap paper, wood and plastic that is not suitable for recycling and which comes from offices, shops and industries. The boiler can also burn recovered wood chips from demolished buildings. In the future it may be possible to use other waste fuels such as nutshells, for instance, or agricultural fuels of various kinds. This fuel mix ensures flexibility at a time when the demand for biofuels is expected to grow dramatically in both Sweden and Europe. By mainly using renewable biofuels to generate electricity and heat, we help reduce emissions of greenhouse gases very substantially.




## Good logistics essential

Fuel for the CPH plant is transported primarily by boat and rail. A lesser amount is brought in by road. The harbour at Igelsta has been expanded to accommodate two ships at once. Also, a fuel terminal has been built alongside the Svealand railway line. Over 200 000 tons of forest fuel arrive here by rail every year, a volume that covers about half of our biofuel needs.

About 200 000 tons of forest wood chips are transported by rail to the Nykvarn terminal every year. Picture from the inauguration in October 2009.

## Better environme

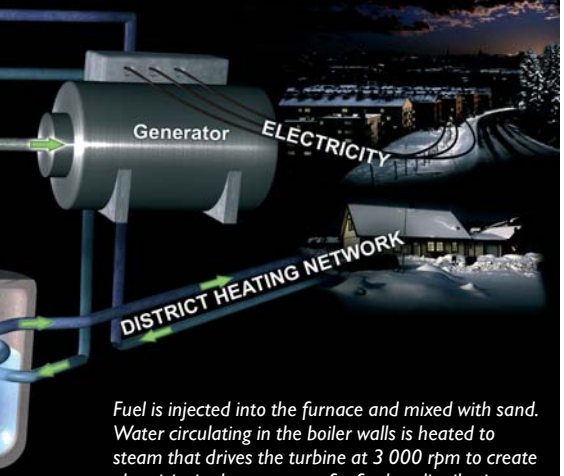
Since 1990 when the Igel into one fired primarily b of carbon dioxide have be duction with the new co-g energi's systems are being year. This corresponds to 15 000 kilometres a year. it means a reduction of 45 of $CO_2$ per year, in terms stituted imports of electri coal- and oil-fired power p the continent. Altogether power generation in Söde sytems today is 90% rene

The generator and the turbine. The turbine is one of the largest ever built by Siemens for a bio-fuelled plant.

The feed water tank shown here is 22 m long and 4 m in diameter. The 70-ton tank was driven to Igelsta from Finland on a 44 m long trailer.

y

ion of co-generated electricity and heat is extremely efficient and luable resources. The surplus heat not used for production of ty (approx. 70%) is recovered and passed on to district heating. In al coal-based or nuclear power plants the heat is usually wasted.




*Fuel is injected into the furnace and mixed with sand. Water circulating in the boiler walls is heated to steam that drives the turbine at 3 000 rpm to create electricity in the generator for further distribution.*

*All surplus heat from the production of electricity is recovered and used for district heating of homes, offices etc. Even the heat from the flue gases in the process is recovered and used.*

Ill.: Elin Marklund

## ntal values

sta plant was converted from a coal-firing facility y biofuels and recovered waste fuels, emissions een reduced by 80%. Despite a higher rate of pro- generation boiler, total emissions from Söder- g reduced by a further 75 000 tons of $CO_2$ per the annual emissions of 25 000 cars driving Globally, 0 000 tons of sub- icity from plants on , heat and nergi's wable.

## Facts: The Igelsta CHP Plant

### Construction began in May 2007

*Excavation:* 550 000 cubic metres of earth were dug out of the gravel esker
*Concrete casting:* 13 000 cubic metres
*Reinforcement:* approx. 1 400 tons of steel
*Height of building:* The boiler hall is 63 metres high
*Architects:* Scheiwiller Svensson Arkitekter AB
The plant was inaugurated on 17 March 2010 by King Carl XVI Gustaf

### Sweden's largest bio-fuelled boiler

*Size:* The boiler is 50 metres high.
*Technique:* Circulating fluidized bed (CFB) boiler
*Weight:* 3 000 tons, hanging from steel girders in the roof
*Welding:* It took 8 months for some 150 welders to weld the boiler together
*Boiler lining:* 700 tons of brick
*Feed water tank:* 22 metres long and 4 metres in diameter
*Thermal output:* 240 MW
*Production:* 83 MW of electricity, meeting the power requirements of 100 000 private houses; 200 MW district heating, meeting the heating requirements of 50 000 homes.
*Steam pressure:* 90 bar, 540 degrees Celsius

### Turbine and generator for power production

*Weight:* The turbine weighs 243 tons
*Speed:* The turbine rotates at 3 000 rpm
*Weight:* The generator weighs 130 tons

### Chimney

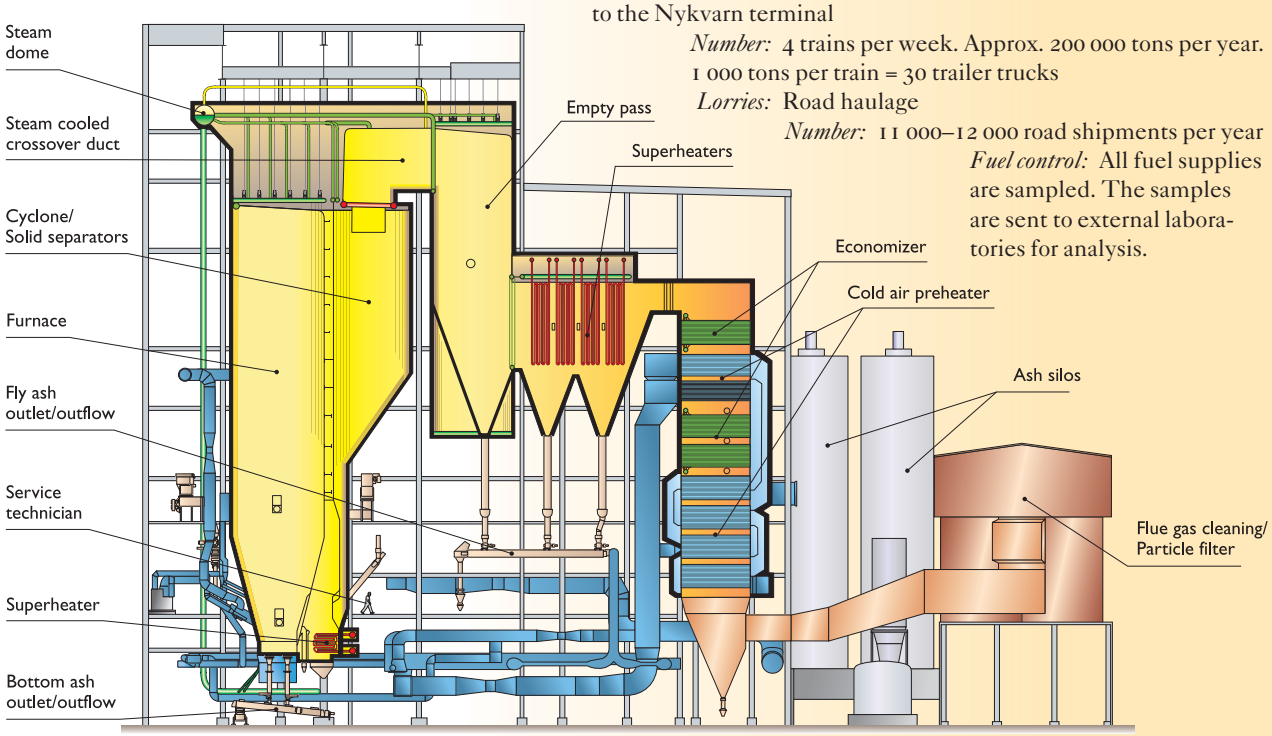
*Height:* The chimney is 110 metres high
*Weight:* It was delivered in six parts and weighs 200 tons

### Fuel

The Igelsta CPH Plant is currently fuelled by residual products from forest clearing, i.e. wood chips (75%) and recovered fuels (25%)

### Logistics: The Igelsta plant as a whole

*Ships:* The Igelsta plant harbour has been expanded to accomodate two ships at once
*Number:* About 200 ships unload here each year
*Trains:* Rail freighting of forest wood chips from all over Sweden to the Nykvarn terminal
*Number:* 4 trains per week. Approx. 200 000 tons per year. 1 000 tons per train = 30 trailer trucks
*Lorries:* Road haulage
*Number:* 11 000–12 000 road shipments per year
*Fuel control:* All fuel supplies are sampled. The samples are sent to external laboratories for analysis.




The boiler was supplied by Foster Wheeler.

Ill.: Foster Wheeler

# Warm&Wise

- Söderenergi produces district heating for some 300 000 people, offices and industries in the southern Stockholm area and electricity enough to power 100 000 homes.
- Our production facilities are the Igelsta heating plant and the Igelsta CHP Plant in Södertälje, and the Fittja heating plant in Botkyrka. We also have two reserve plants, in Geneta and Huddinge.
- We are certified under the ISO 14001 environmental standard. The new Igelsta CHP Plant will be certified in 2010.
- We mainly use biofuels and recovered waste fuels.
- Most of the heat we produce is sold and distributed by Telge Nät in Södertälje and Nykvarn, and by Södertörns Fjärrvärme in Huddinge, Botkyrka and Salem. We also supply heating to Fortum AB.
- Söderenergi is owned by the municipalities of Huddinge, Botkyrka and Södertälje.

Söderenergi

*Green power and heating for a sustainable society*

Box 7074, Nynäsvägen 43, SE-152 27 Södertälje, Sweden
Telefon: +46-8-553 055 00 · Fax: +46-8-553 056 90 · www.soderenergi.se

Cover photo: MEJ · Graphic design & prepress: Ateljé Hunting Flower AB · Printed on environmentally friendly paper by Kjellis Offset AB · Stockholm in February 2010.