

Best Practices

TIMBER Project



Igelsta CHP-plant, the largest biofuelled co-generation plant in Sweden

Renewable Energies

Region
Stockholm County
Sweden

THEME	Heat and electricity production based on biofuels and recovered waste fuels.
OBJECTIVES	Presentation of resource-efficient use of biomass and profitable heat and electricity production based on renewable energy.
LOCATION	City of Södertälje, Stockholm County, Sweden
DETAILED DESCRIPTION	Timescale The planning process for the new plant has been going on for several years. Important steps were the appointing of a project leader and a formal environmental permit granted in 2006. The construction started in 2007 and Igelsta CHP was inaugurated in march 2010.



Bodies involved / implementation

Söderenergi is owned by Telge AB (42%) which is part of the City of Södertälje and by Södertörns Energi AB (58%), which is a holding company owned by the municipalities of Huddinge and Botkyrka. The two controlling companies, exert the same degree of influence.

Process and detailed content

Igelsta CHP plant is the largest biofuelled co-generation plant in Sweden. The plant has a capacity of 200 MW heat and 85 MW electricity, enough to heat 50.000 private houses and power 100.000 homes. The boiler is a circulating fluidized boiler and it can handle different types of biofuels. The plant has a flue gas condenser, which means that the heat from the flue gases is recovered and used, and results in a higher thermal output for the plant. All in all about 70 % of the produced heat in Igelsta CHP is recovered and used, which result in very efficient production. The main fuel is forest waste, i.e. wood chips from branches and tops. A smaller share is waste fuel, comprising quality-controlled scrap-paper, wood and plastics that is not suitable for recycling and origins from offices, shops and industries. Other waste fuels may be used in Igelsta CHP plant in the future, for example nut shells and agricultural fuels. The fuel is transported primarily by boat and rail. A lesser amount is brought in by road transports. Söderenergi has built a fuel terminal alongside the Svealand railway line. Over 200.000 tonnes of forest fuel arrive at Igelsta by rail every year. Good logistic is essential for a large biofuelled plant like Igelsta that burns up between 600.000 and 700.000 tonnes of fuels per year depending on the fuel mix. The emissions from Igelsta CHP plant are low. The flue gas is treated with selective non catalytic reduction and the flue gas condensate is treated by ultra-filter, reverse osmosis and metal separation. All process waste water from the plant is treated. Igelsta Plant will be certified under the ISO 14001 Environmental standard during 2010.

Legal framework

The most essential legal framework concerning the energy production in Igelsta is the Environmental Code and the legislations on work environment. The plant has an environmental permit from 2006, regulating its operation and emissions. The permit regulates the emissions to air and water, fuel logistics, waste management and noise and contains requirements

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on controlling the activity in the plant and report the result of the control program to the Swedish Environmental Agency. Further, legislation on work environment regulates how employers should act to prevent ill-health and accidents at work and to achieve a good working environment.

Financial framework

The total budget for planning and construction of Igelsta CHP plant was 250 million Euro.

Opportunities

- By choosing a co-generation plant, Söderenergi can increase the heat and electricity production and in the same time reduce the total emissions of CO₂;
- According to economic calculations the investment in Igelsta Plant is profitable for the owners. The pay-back period is 10-12 years;
- By investing in a circulating fluidized boiler Söderenergi has ensured fuel flexibility, which is very important in times when demand on biofuels is increasing;
- With expanded production in place, security of supply is strengthened further.

Threats

- Decreasing demand of heat in future, caused by more energy efficient buildings;
- Increased competition on biofuels, resulting in rising prices;
- Risk of possible disruptions of fuel transports to the plant.

CO₂ reduction (expected)

75.000 tonnes

EVALUATION

(Expected) Energy production

1,3 TWh heat and 0,55 TWh electricity

Possible demonstrated results (e.g. through indicators)

By investing in Igelsta CHP plant Söderenergi has:

- Increased the share of renewable fuels from 85 % to 90 % of the fuel mix in the total district heating system, by replacing peat and oil with biofuels;
- Reduced the CO₂ emissions with 75.000 tonnes per year and also reduced the emissions of sulphur dioxides, despite an increased heat and electricity production;
- Increased the fuel flexibility and strengthened the security of supply.

LESSONS LEARNT

Possible success factors

- Location of the new plant on an existing site where logistics is already well developed;
- Communicating with policy makers and public about the new plant has been a crucial effort from the very beginning of the project.

A large bio-fuelled co-generation plant, producing district heating and electricity simultaneously, is an example of a resource-efficient way of using biomass, resulting in many positive effects in the concerned region. An important lesson from Igelsta is that fuel flexibility is a vital question for heat and electricity producers, due to an increasing competition on biofuels. Further, good logistics i.e. own harbours facilities are essential for large bio-fuelled plants, due to large volumes of fuels.

CONTACT

Michael Erman, Office of Regional Planning, Stockholm County Council,
T +46 8 737 44 99

E michael.erman@regionplanekontoret.sll.se

Madeleine Engfeldt-Julin, Communication Manager at Söderenergi:
T +46 8 553 055 06

E Madeleine.engfeldt-julin@soderenergi.se;

OTHER INFORMATION

Various documents: 'The Igelsta CHP plant', 'Our fuels'
Söderenergi's webpage: <http://www.soderenergi.se>