Luxembourg, 17th December 2013

Environmental and Social Data Sheet

Overview

Project Name:	Fortum CHP Plant Stockholm
Project Number:	2013-0324
Country:	Sweden
Project Description:	The project comprises the design, construction, and operation of a new biomass combined heat and power (CHP) plant including the necessary biomass handling facilities and an upgrading of port facilities. The plant will be located in the city of Stockholm. It delivers heat to the existing district heating system in Stockholm and electricity to the public grid.

EIA required: YES

Project included in Carbon Footprint Exercise[1]: YES

(details for projects included are provided in section: "EIB Carbon Footprint Exercise")

Summary of Environmental and Social Assessment, including key issues and overall conclusion and recommendation

The project concerns a 130 MW_e/280 MW_{th} biomass combined heat and power (CHP) plant. It contributes to an increased utilisation of renewable energy sources and supports the sustainable management of EU forests through the use of regional forest residues. The project generates all electricity from high-efficient CHP as defined by the Energy Efficiency Directive 2012/27/EU and provides for 30 % of primary energy savings when compared to a separate generation of heat and electricity from the same fuel.

The project is located in an existing industrial site within an urban area of Stockholm with appropriate connection capacity to the district heating system. It benefits from existing connections to sea, rail and road for biomass supply. The project site is located outside any Natura 2000 site.

The project falls under Annex I of the Environmental Impact Assessment (EIA) Directive 2011/92/EU. An EIA is therefore obligatory in order to get an environmental authorization for operation.

The Bank has received and reviewed the project's Environmental Impact Studies (EIS). The EIS selects the project site amongst several alternatives and concludes that the CHP plant at this site has no significant negative environmental and social impacts. The most relevant residual impacts originate from temporary noise and traffic during construction works and, during operation, from pollutant emissions of the combustion process, increased traffic due to biomass transports, and the visual appearance of the CHP plant. Pollutant emissions are minimised by the use of best-available-technique. Biomass transports will primarily take place by vessels and train, only a small part will be delivered by trucks. The plant building has been designed by architects in order to minimise the visual impact.

The environmental permit for operation was granted by the Competent Authority in November 2007. The permit comprises a comprehensive set of mitigation measures and monitoring obligations regarding noise and pollutant emissions. Emission limits are more stringent than the limit values in Industrial Emission Directive (IED) 2010/75/EC. The plant's permit further allows the use biomass, peat and coal. This broad fuel portfolio was initially requested by the promoter when the permitting process started back in 2005. Today, plant design and business

[1] Only projects that meet the scope of the Pilot Exercise, as defined in the EIB draft Carbon Footprint Methodologies, are included, provided estimated emissions exceed the methodology thresholds: above 100,000 tons CO2e/year absolute (gross) or 20,000 tons CO2e/year relative (net) – both increases and savings.

plan are focussed on biomass use only. The promoter considers the use of coal and peat merely as a back-up and reserve option. A corresponding undertaking is proposed in order to secure this approach. **The use of peat and coal shall be limited to back-up and reserve applications only**

The CHP plant will consume around 920 kt of forest and non-contaminated forest based industry residues per year. This amount of wood will be sourced from Sweden (40%), the Baltic region (40%), and other regions further offshore (20%). The promoter has a sustainable supply policy in place and aims to increase the amount of fuel wood from forests with certified evidence on sustainable forest management. **A comprehensive set of undertakings has been proposed in order to ensure that all biomass consumed by the project will originate from sustainable sources.**

A local environmental NGO (Djurgården Lilla Värtans miljöskyddsförening) has contested several project permits in view of the project's location close to the city. The NGO states that guidelines for protecting distance to the nearby housing area has not been respected as well as that expected noise levels will have an impact on the local population. All but one appeal have been turned down by court decision due to non-relevance. The NGO's appeal against the building permit is pending and expecting a court decision in due time. **It is proposed that the promoter undertakes to inform the Bank immediately after a related court decision about the contents of this decision and potential consequences to the project.**

Based on the above, the project is considered acceptable for Bank financing from a social and environmental point of view, with conditions.

Environmental and Social Assessment

Environmental Assessment

The CHP plant and its biomass reception and processing infrastructures will be erected inside an existing industrial facility adjacent to other heating and CHP plants. The environmental authorisation of the project was requested by the promoter as one of several activities to be pursued on the same industrial site.

By virtue of its technical characteristics (thermal capacity of 370 MW_{th}), the project falls under Annex I of the EIA Directive 2011/92/EU. The competent authority in line with Swedish environmental law (Miljöbalken) requested an Environmental Impact Assessment (EIA) including public consultation.

The promoter applied in May 2006 for an environmental permit. It was accompanied by an environmental study which is deemed a comprehensive study, covering the whole project scope including CHP plant, fuel handling facilities, harbour works. The EIS assesses different plant location alternatives, quantifies potential environmental impacts of the CHP plant during construction and operation, and evaluates cumulated impacts from the project in combination with emissions from current facilities. The EIS also proposes preventative and mitigation measures for the operating period in order to avoid and/or minimize potential impacts. In particular:

- Eight different alternative sites have been analysed in the EIS and compared. From a technical and economic perspective Värtaverket was concluded the most suitable location for the installation of the new CHP plant. The selected site is located in the north-east of Stockholm City, in a short distance from housing area (from the plant to the closest housings in Hjorthagen is only 50 meters). The site is included in the city developing plan for Stockholm City “Stockholmsvisionen” and the project does not affect areas of nature conservation interest. The distance to closest Nature Conservation site is approximately 1km (Nationalstadsparken). There are three oaks on the direct project site which must be kept.
- During implementation, the main impacts are noise and traffic. The mitigation measures are typical to a large construction site situated in populated area, consisting of appropriate work methods and work scheduling. Noise levels will be constantly monitored during construction.

- During operation, the project's main residual impact relates to its pollutant emissions. The forecasted pollutant emission from the operation of the power plant is compliant with national emissions limits and the project's compliance with ambient air quality objectives of the region is ensured. The emission limit values for the CHP plant in the environmental permit are more stringent than the limit values in Industrial Emission Directive (IED) 2010/75/EC. Boiler and biomass handling equipment complies with best-available-technique standards. Flue gases are treated by SNCR technique, optional limestone injection, bag-house filter and flue gas condensation. Additional measures are taken to effectively limit dust emissions during biomass handling and storage onsite.
- The flue gas condensation in the CHP constitutes a negligible contribution to the emission of metal to water in Stockholm.
- Other impacts during the operation are noise due to increased boat transports, fire risk in the fuel storage and ground water inflow. The sound level will be kept to a minimum and measures are taken both for existing facilities and the planned plant. A fire risk assessment has been performed and appropriate measures such as fire warning system, sprinklers in chip conveyors, and water cannons on pier and fuel storage will be installed. Close monitoring of groundwater levels will be performed during construction and the sealing of rock cavities and tunnels performed

Based on the EIS including public consultations held in December 2005, the competent authority [Miljödomstolen] concluded that the project does not have any significant negative environmental impacts provided that all proposed mitigation measures are implemented. The competent authority granted the permit for the project in November 2007. The permit includes key conditions of limit values for air and water emissions, noise limit values (during and after construction). Further the permit includes conditions for emissions of mercury to air and emission values in condensate.

It is noted that the environmental permit allows for the use of biomass, coal and peat. Given that the plant is expected to vitally contribute to sustainability objectives of both the promoter and the city of Stockholm, and given that both business plan and technical plant design are tailored to biomass use, it is deemed unlikely that peat and coal will be utilised to a significant extent in this project. This is also supported from a financial perspective since the electricity produced from peat or coal is not entitled to benefit from electricity certificates. Further, the project area is characterised by a low peat availability.

A separate environmental permit regarding the drainage of groundwater from rock cavities, shafts and tunnels was granted by Miljödomstolen in November 2007.

The above authorisation process does not provide certainty regarding a sustainable biomass supply. The promoter's goal is to increase the amount of fuel wood originating to certified forests. A stepwise approach is used to purchase fuel wood in responsible way and achieving complete traceability through the supply chain back to the forest. The long term goal is that the fuel wood comes from forests certified according to a credible certification standard. The Bank requires the promoter to present a quantitative road map to develop biomass sourcing towards this goal.

In addition, the Bank requires that the promoter puts a policy in place to ensure that the forest based biomass is sourced from and originates to traceable, environmentally and socially sustainable sources. The sourcing areas are to be certified by internationally accredited certification schemes, such as FSC or PEFC, or if not yet certified the forest management practices need to comply with the standards so as to be certifiable. For non-certified sources, the promoter is required to have a credible auditing procedure in place to provide evidence that the standards are followed.

EIB Carbon Footprint Exercise

In accordance with the Bank's Carbon Footprint methodology, it is calculated that the total relative effect of the biomass CHP plant with the use of 10% coal as back-up is a net

reduction in CO2 equivalent emissions by 490 kt CO2e/yr. This calculation assumes that 50% of generated electricity substitute power generation in existing fossil fuel based power plants whilst 50% substitute power generation in new gas-fired combined cycle power plants. It is further assumed that cogenerated district heat substitutes heat generation from existing generation mix of heat pumps, bio-oil, wood pellets and fossil fuel heat-only boilers and coal/biomass CHP.

For the annual accounting purposes of the EIB Carbon Footprint, the project emissions will be prorated according to the EIB lending amount signed in that year, as a proportion of project cost.

Public Consultation and Stakeholder Engagement

Consultation of the public and relevant authorities is an integral part of the EIA process. Two public consultations meetings have been conducted in December 2005 and comments and complaints were documented and included in the EIS.

Other Environmental and Social Aspects

The project is constructed at an already existing industrial facility, and is not causing any resettlements. Occupational and Community Health and Safety issues are deemed appropriately addressed in the authorisation process. The promoter has a comprehensive health and safety policy in place. The implementation of the project is not expected to raise significant social issues.

The nearest residential housings are situated 50 m from the site boundary, and some 100 m from the planned power plant. The impact on these housing will be reduced through appropriate mitigation measures (specified maximum noise levels set apart for day time works, works at night and during weekends). These will as well be ensured by measuring program after commissioning.

The promoter has substantial experience in the implementation and operation of energy infrastructure. It is expected that the promoter has a high environmental and social management capacity.