SETatWork Good Practice

PGE Lublin CHP, Poland

Setting	
Country	Poland
Location	Lublin
Project start date	
Project end date	2002
Technology keywords	CHP
Host sector	Polish Energy Group – PGE S.A.
Technical summary of the project	
Objective of the project	
Project description	

PGE Lublin CHP

Project Type: (New Generating Capacity: CHP) – EG 06

Since 2002 the most important part of generation installations in Lublin CHP has been natural gas fired Combined Cycle Unit that produces electricity and heat in high efficient cogeneration. Total installed capacity: 150 MWt and 235 MWe. After this low emissive unit has been put into operation, coal fired water boilers are used only during heating season (when CCU reaches max. thermal capacity) or during CCU downtime.

Environmental benefits related to new unit start up result from water boilers replacement by Combined Cycle Unit and fuel switch from coal to natural gas. It has brought particular effects:

- SO2 and dust emissions reduction connected with coal usage decrease and trace
- level of emissions from natural gas burning;
- NOx emissions reduction related to limited water boilers exploitation and fuel switch
- to natural gas;
- CO_2 emission reduction resulting from natural gas burning – emission factor is lower
- for about 40% compared to coal.

Project reasons

The investment was voluntary action of the company but influenced by EU/national regulations.

Project Appraisal and Estimation Methods

The project resulted in significant environmental (e.g. lower CO_2 emissions), economic (e.g. power savings) and social (e.g. image improvement) benefits. Calculation of CO_2 emissions reduction is based on chemical energy consumption during heat generation process. Average annual chemical energy (for 8 years of CCU exploitation) is on the level of 10.042.614 GJ.

Emission without project:

Calculation is based on chemical energy of coal, that would have been burned to achieve the same generation level:

- chemical energy = 10.042.614 [GJ]
- oxidation factor (coal) = 0,986 – *Wu*;

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- CO_2 emission factor = 97,97 [kgCO_2/GJ] – *WeCO_2*.

Average annual emission without project (coal):

- *ECO_2* = *En chem*. x *WeCO_2* x *Wu* = 970.100 Mg
- Emission per year = 970.100 Mg
- Emission during 8 years of exploitation = 7.760.805 Mg.

Emission with project:

- chemical energy = 10.042.614 [GJ]
- oxidation factor (coal) = 0,996 – *Wu*;
- CO_2 emission factor = 55,81 [kgCO_2/GJ] – *WeCO_2*.

Average annual emission with project (coal):

- *ECO_2* = *En chem. x WeCO_2 x Wu*
- *ECO_2* = (10.042.614 GJ x 0,996 x 55,81 kg/GJ)/1000 = 558.236 Mg
- Emission per year = 558.236 Mg
- Emission during 8 years of exploitation = 4.465.888 Mg
- Avoided CO_2 emission = emission without Project – emission with Project
- Avoided CO_2 emission per year ~ 410.000 Mg
- Avoided CO_2 emission during 8 years of exploitation ~ 3.300.000 Mg Project Type: (New Generating Capacity: CHP) – EG 06

Environmental and social benefits	
(Estimate of) Greenhouse Gases abated	Annual: Up to and including 2012: tCO_2-equivalent Up to a period of 10 years: tCO_2-equivalent Up to a period of 15 years: tCO_2-equivalent
Number of reduction units	
Socio-economic aspects	
Methodology used	
Host organisation	
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