Seminar on the Joint Crediting Mechanism (JCM) Project Implementation in Indonesia

Power Generation by Waste Heat Recovery in Cement Industry



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JCM Model Project Summary



Counterpart	PT Semen Indonesia
Site	Tuban Plant, East Jawa
Power Generation	28MW
GHG Emission Reduction	122,000t-CO2 /year





Recent Project Photos -1



All Critical Equipment Component Installed The System under Commissioning



No.1 SP Boiler Area

No.1 AQC Boiler Area

Recent Project Photos -2











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JCM Project Scheme





Eligibility Criteria - Approved Methodology ID_AM001



Criterion 1	The project utilizes waste heat from a cement production facility by waste heat recovery (WHR) system to generate electricity
Criterion 2	WHR system consists of a Suspension Preheater boiler (SP boiler) and/or Air Quenching Cooler boiler (AQC boiler), turbine generator and cooling tower
Criterion 3	WHR system utilizes only waste heat and does not utilize fossil fuels as a heat source to generate steam for power generation
Criterion 4	WHR system has not been introduced to a corresponding cement kiln of the project prior to its implementation
Criterion 5	 The cement factory where the project is implemented is connected to a grid system and the theoretical maximum electricity output of the WHR system, which is calculated by multiplying maximum electricity output of the WHR system by the maximum hours per year (24*365=8,760 hours), is not greater than the total amount of the electricity imported to the cement factory from the grid system: > During the previous year before the validation, if the validation of the project is conducted before the operation of the project, or > During the previous year before the operation of the project, if the validation of the project is conducted after the operation of the project.
Criterion 6	The WHR system is designed to be connected only to an internal power grid
	of the cement factory.
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Calculation of Reference Emissions



		Α	В	С	D	E(A*B*C*D)
Qua Gene	ntity of Electricity eration	Generation Capacity (MW)	Operating day per year (days/y)	Time (hrs/day)	Operating Rate	Electricity (MWh)
	Dry Season	28	182.5	24	0.85	104,244
	Rainy Season	22	182.5	24	0.85	81,906
The elec con	e quantity of ctricity sumption	2.4	365	24	1	21,024
The	quantity of net	electricity q	eneration b	by the WH	IR	

system which replaced grid electricity import 165,126

$RE_{y} = EG_{y} * EF_{grid}$ = 165,126 MWh/y * 0.741 tCO₂ e/MWh = 122,358 tCO₂e/y

Reference Emissions

Reference

Reference is the situation where WHR system has not been introduced. Diffusion rate of WHR system is very low in Indonesian Cement Industry 1 plant installed / 25 plants total

Conservativeness

Electricity consumption of WHR system is calculated by the theoretically maximum load of auxiliary equipment => Rated capacity of installed equipment (EG_{CAP}) related to WHR system and max. hours/period



The quantity of gross electricity generation by waste heat

EG_{AUX,y} :2.4MW(EG_{CAP})*24h/d*365days 1.9MW(Designed capacity)*24h/d*365days



Emission Reduction / Monitoring



Emission Reductions = **Reference Emissions**



Project Emissions = 0

Monitoring

EG_{GEN}, y: Quantity of gross electricity generation

Watt meter log data are saved:

every one minute in both electronic data in a server and on printed paper

After WHR System Installation





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Waste Heat Recovery Benefits



CO₂ Emission Reduction	Electricity Reserve for the Community
No Additional Fuel Required	Savings on Production Costs



WHR System to other cement factory in Indonesia

More opportunities in further reduction of GHG emission



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Reference : JCM WTE Project for Yangon City

JFE

First WTE Project in Myanmar

First WTE Project with JCM

Counterpart	Yangon City Development Committee	
Technology	Waste to Energy(WTE) Incinerator : 60ton/day Generator : 0.7MW	-
GHG Emission Reduction	4,700t-CO ₂ /year	
EPC Budget	Yangon City's Budget + JCM Subsidy from Japan	
Schedule	EPC:FY2015-2016 (approx.1.5years) MRV:FY2017-2032 (15 years)	Facility Ope

10, 10

Proposing Timeline for 2 Phase Project







http://www.jfe-eng.co.jp/en/