



Calculation of Baseline Emissions for Waste Gas/Heat Recovery Project

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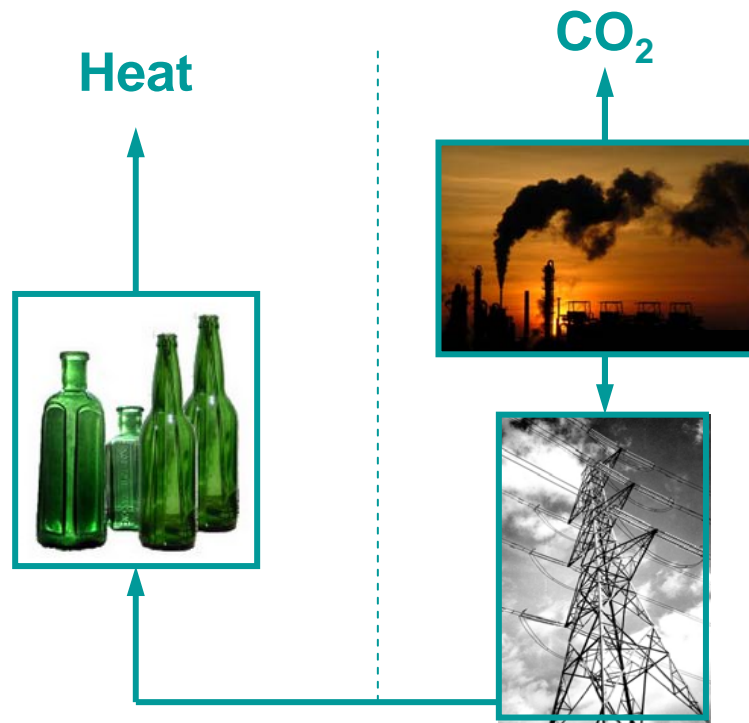
Umarat Santisukkasaem
Thailand Environment Institute



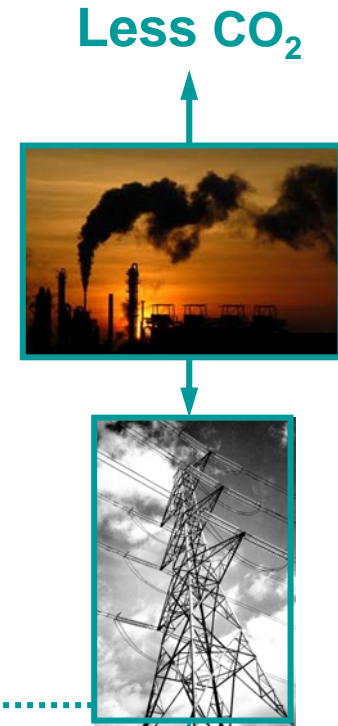
Example: Glass Production



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Waste Heat Recovery System





How does “Waste Gas/Heat Recovery Project” reduce GHG?



- Reduce fossil fuel consumption by generating renewable energy
 - Reduce power generation of thermal power plant by supplying power to the grid
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Overview on Emission Sources



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■ Included/Excluded from the project boundary

	Source	Gas	Included?	Justification/Explanation
Baseline	Power Grid	CO ₂	Included	Main emission source
		CH ₄	Excluded	Excluded for simplification. This is conservative.
		N ₂ O	Excluded	Excluded for simplification. This is conservative.
Project Activity	The Project Activity	CO ₂	Excluded	No auxiliary fuels are fired in the project activity, so the emissions resource will be excluded
		CH ₄	Excluded	Excluded for simplification.
		N ₂ O	Excluded	Excluded for simplification.



Baseline Emissions



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$$BE_{electricity,y} = EG_y \times EF_{electricity,y}$$

EG_y

The net quantity of electricity supplied to the manufacturing facility by the project activity during the year y (MWh)

$EF_{electricity,y}$

CO₂ baseline emission factor for the electricity displaced due to the project activity during the year y (tCO₂/MWh)



Project Emissions



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$$PE_y = \sum_i Q_i \times NCV_i \times EF_i \times \frac{44}{12} \times OXID_i$$

PE_y	Project emissions in year y (tCO ₂)
Q_i	Mass or volume unit of fuel i consumed (t or m ³)
NCV_i	Net calorific value per mass or volume unit of fuel i (TJ/t or m ³)
EF_i	Carbon emissions factor per unit of energy of the fuel i (tC/TJ)
$OXID_i$	Oxidation factor of the fuel i (%)



Exercises



- **Project type:**
 - Waste heat recovery captive power stations
 - **The emission reduction activity:**
 - Replace electricity from the power grid
 - **Methodology:**
 - ACM0004 version 02 “Consolidated methodology for waste gas and/or heat for power generation”
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Exercises (Continue)



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■ Assumptions for Calculation

Project Emissions	Applicable only if auxiliary fuels are fired for generation start-up or to provide additional heat gain before entering the waste heat recovery boiler
Baseline Emissions	Emission reduction due to displacement of electricity <ul style="list-style-type: none">○ Grid emission factor: 0.58 tCO₂/MWh○ Power generator capacity: 6 MW○ Annual operation hours: 6,118 hours