



# EU-China CDM Facilitation Project Workshop on Verification

## Case Study 1: Meizhou Landfills Gas Recovery and Utilization as Energy Project

Beijing

March 4<sup>th</sup> – 5<sup>th</sup>, 2008

Günter **Schock**  
TÜV Rheinland Group



EU China CDM Facilitation Project



## ► Contents

- **Description of project**
- Final monitoring report of first monitoring period
- Initial and first periodic verification report including protocol
- Summary



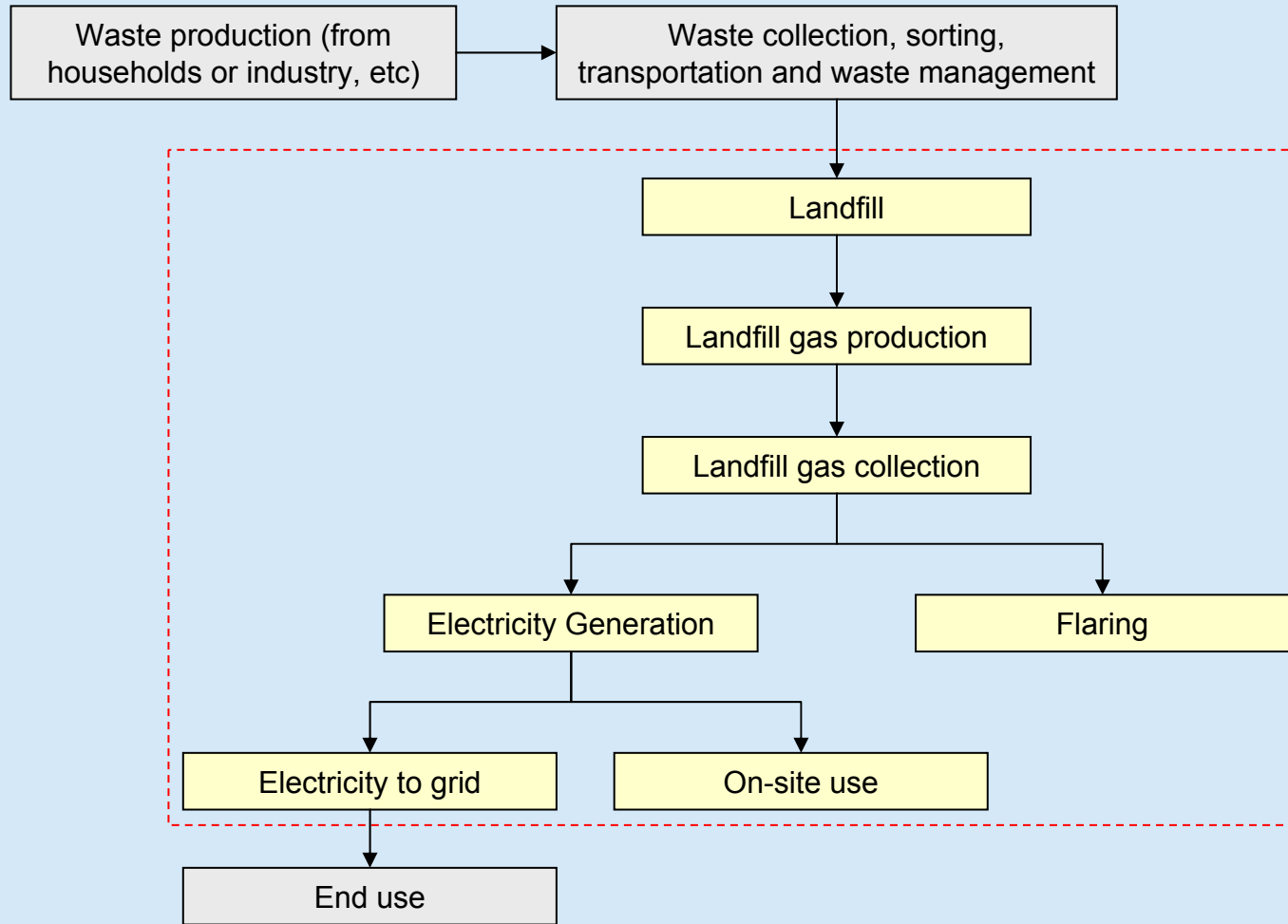
## ► Description of project

Title	Meizhou Landfills Gas Recovery and Utilization Energy	
Project number	0176	
Sectoral scope	13	
Methodology	ACM0001_version 02	
Host Party	China	
Date of registration	03/03/2006	
DOE of validation	DNV	
DOE of verification	TÜV SÜD	
Crediting period	01/09/2005 – 31/08/2012	
First monitoring period	01/09/2005 – 31/12/2006	
	Status: CERs issued	48,840 t CO <sub>2</sub> e

## ► Description of project

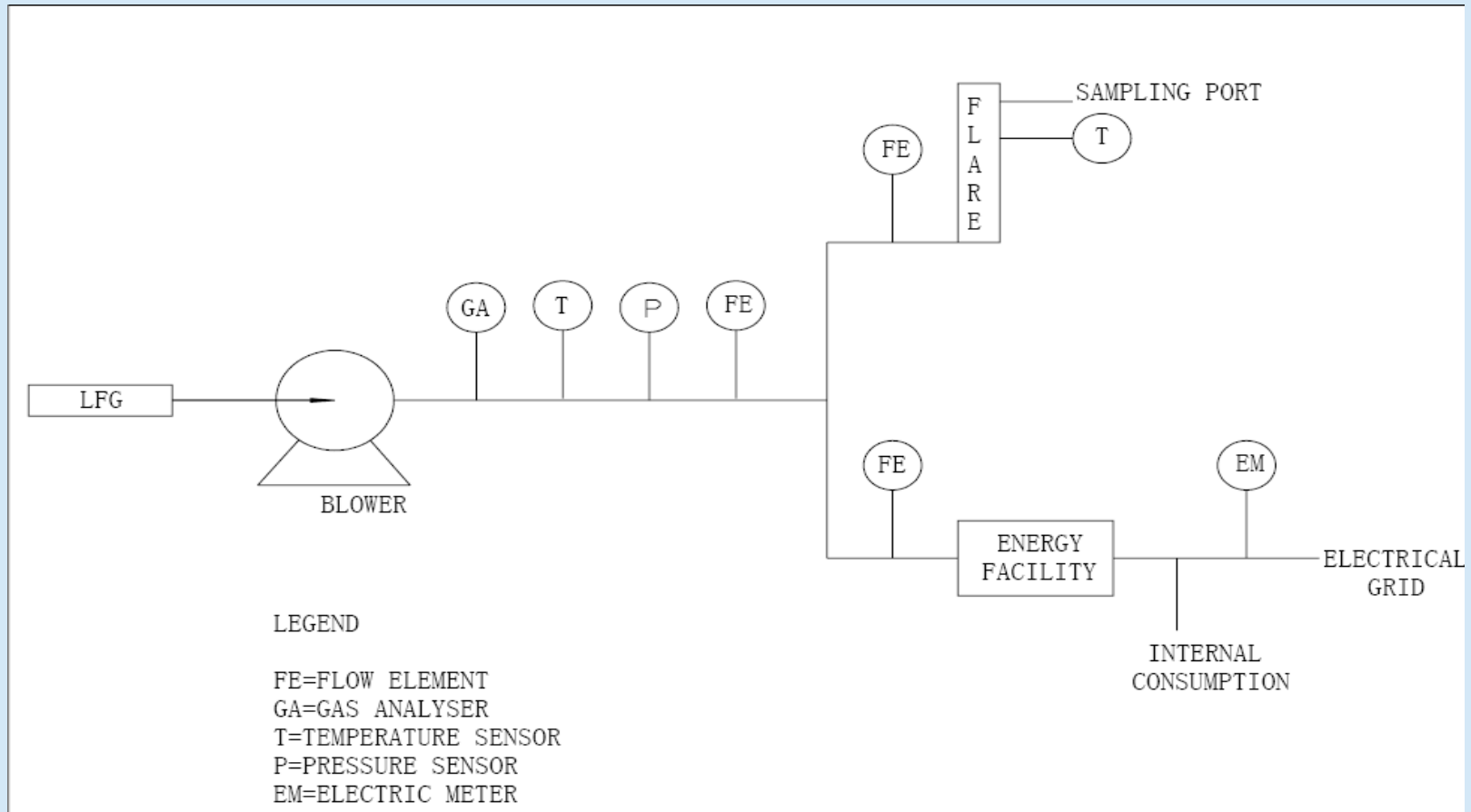


# ▶ Project Boundary



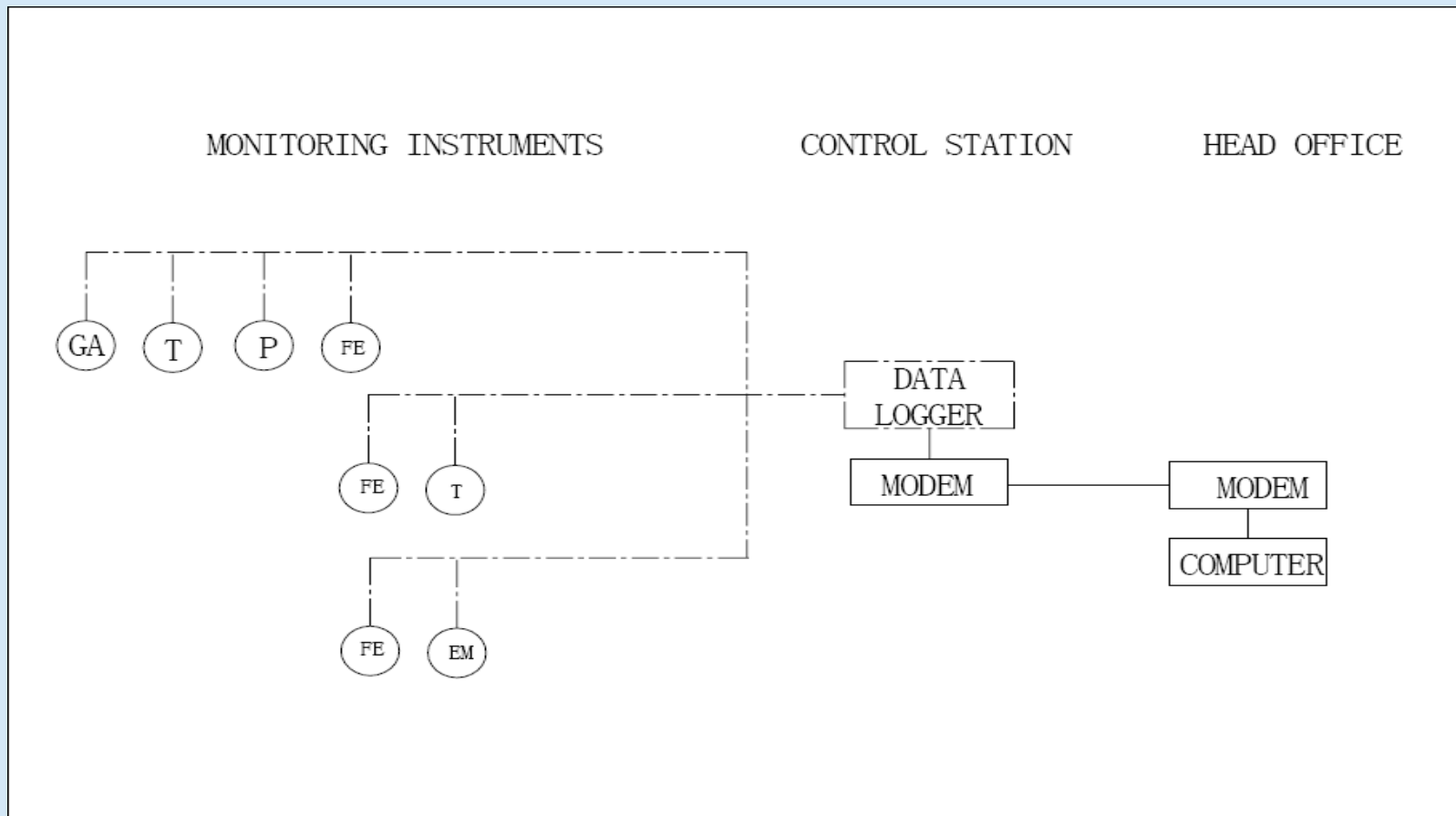
# ▶ Monitoring plan

## Installation of monitoring equipment



# ▶ Monitoring plan

Collection of monitoring data



## ▶ Monitoring methodology

Data to be monitored



8

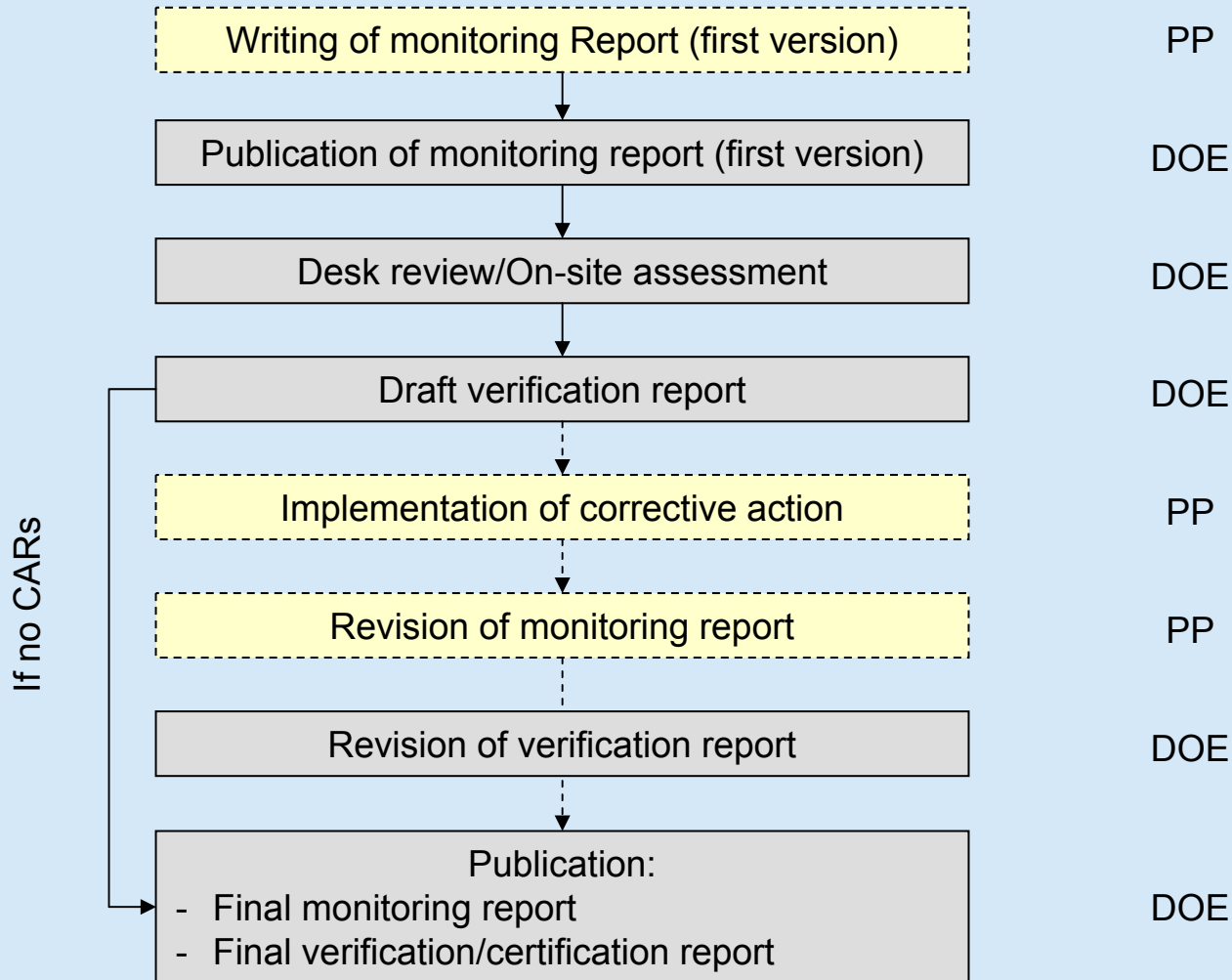


## ► Contents

- Description of project
- **Final monitoring report of first monitoring period**
- Initial and first periodic verification report including protocol
- Summary



## ► Responsibility during reporting



## ► Final monitoring report of first monitoring period

### Contents

- Project background
- Monitoring background
- Monitoring results
  - Emission reduction
  - Monitoring period covered
  - Presentation of monitoring results – spreadsheet
  - QC measures of the monitoring results
  - Calculation formula
  - Calculation methodology
- Annex

## ► Project background

- 8 landfills (1 big in Longfeng, 7 small around Meizhou)
- Stage 1: Longfeng
  - Stage 1a: LFG collecting and flaring (construction completed)
  - Stage 1b: LFG utilization (under construction)
- Stage 2: landfills around Meizhou (under construction)
- Total estimated annual CERs = 286,525
- Displacement of electricity not claimed for the first 7 years

## ▶ QC measures of the monitoring results

All monitoring data have been quality controlled by following measures:

1. Certification or License provided by manufacturers of gas flow and methane fraction meters
2. Regular calibration records of kWh-meters, gas flow and Methane fraction meters
3. Management regulation of CDM database archives



## ► Calculation formula

### Calculation formula

The general calculation formula for emission reduction of landfill gas project is listed below:

1.  $ER = (MD_{\text{project}} - MD_{\text{reg}}) * GWP_{\text{ch}_4} + EG * CEF_{\text{electricity}} - ET * CEF_{\text{thermal}}$ , Where,

ER = emission reduction [tCO<sub>2e</sub>/year]

MD<sub>project</sub> = methane destruction [tCH<sub>4</sub>/year]

MD<sub>reg</sub> = methane destruction in absence of project [tCH<sub>4</sub>/year]

GWP<sub>ch<sub>4</sub></sub> = global warming potential methane

EG = net quantity of electricity displaced [MWh/year]

CEF<sub>electricity</sub> = emission intensity of the grid where the project connected [tCO<sub>2e</sub>/MWh]

ET = incremental quantity of fossil fuel, defined as difference of fossil fuel used in the baseline and fossil use during project [TJ]

## ► Calculation methodology

1. Collect the recorded data of
  - LFG flows ( $LFG_{total}$ ,  $LFG_{flare}$ , and  $LFG_{electricity}$ )
  - methane fraction in the landfill gas ( $w_{CH_4}$ )
  - net quantity of electricity displaced (EG)
2. If  $(LFG_{flare} + LFG_{electricity}) \approx LFG_{total} \Rightarrow$  go ahead, if not check recorded data
3. If  $EG > 0 \Rightarrow$  ignore  $CO_2$  emissions from use of electricity for plant activity
4. If  $EG < 0 \Rightarrow$  consider  $CO_2$  emissions from use of electricity for plant activity
5. Calculate LFG flow for relevant time period in  $[Nm^3]$
6. Multiply LFG  $[Nm^3]$  with vol.%  $CH_4$  and with density of  $CH_4$  to get  $CH_4$  in  $[t]$
7. Apply adjustment factor AF (%) to calculate net  $CH_4$  in  $[t]$
8. Multiply net  $CH_4$  in  $[t]$  with 21 (GWP) to get  $CO_2$ -equivalent in  $[t]$

## ▶ Published documents during first monitoring period

- Monitoring Report (version 01)
- Final monitoring Report
- CDM Management Manual
- Calibration certificates for flow meters
- Calibration certificate for methane fraction meter
- Data sheets for monthly monitoring report (2006)
- Data sheets for annual monitoring report (2005 – 2006)
- Test sheets for flare combustion efficiency



## ► Contents

- Description of project
- Final monitoring report of first monitoring period
- **Initial and first periodic verification report including protocol**
- Summary



## ► Initial and first periodic verification report including protocol

1	<u>INTRODUCTION</u>	3.3	Internal and External data
1.1	Objective	3.4	Environmental and social indicators
1.2	Scope	3.5	Management system and operation system
1.3	GHG project description		Periodic verification findings
2	METHODOLOGY	3.6	Completeness of monitoring
2.1	Review of documents	3.7	Accuracy of emission reduction calculations
2.2	Follow-up interviews	3.8	Quality of evidence to determine emission reductions
2.3	Resolution of corrective and forward action requests	3.9	Management system and quality assurance
3	VERIFICATION FINDINGS	4	PROJECT SCORECARD
	Initial verification findings	5	VERIFICATION STATEMENT
3.1	Remaining issues, CARs, FARs from previous validation	Annex 1	Verification Protocol
3.2	Project implementation	Annex 2	Information Reference List

► Initial and first periodic verification report including protocol

Findings during initial and first periodic verification:

**5 CARs and 1 FAR:**

3.5 Calibration and quality assurance	CAR 1
3.6 Data acquisition and data processing systems	CAR 2
3.7 Reporting procedures	CAR 3
3.9 Qualification and training	CAR 4
7.4 Emergency procedures	CAR 5
Future monitoring reports should include a legally binding signature.	FAR 1

## ► Contents

- Description of project
- Final monitoring report of first monitoring period
- Initial and first periodic verification report including protocol
- **Summary**



## ► Summary

Further Information about Case Study 1:

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1135170125.82/view>



21



