

DOMESTIC BIOGAS & CDM FINANCING

Perfect match or white elephant

*International Seminar on Biogas Technology,
Beijing, 2005.*



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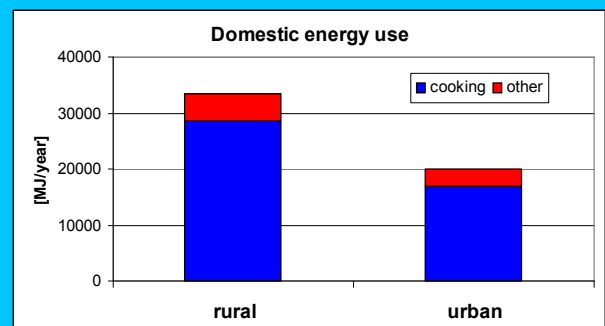
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Domestic energy in Vietnam

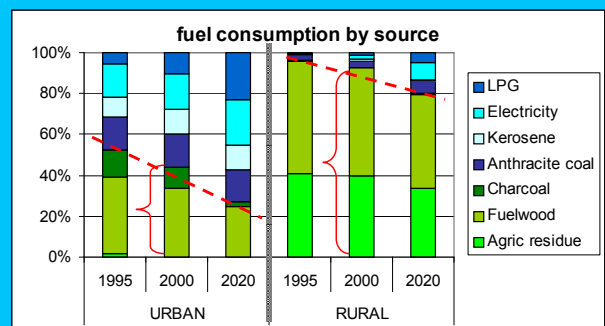
Energy consumption:

- Urban: 20,000 MJ / year
- Rural: 33,000 MJ / year
- 85% for cooking.



Energy source:

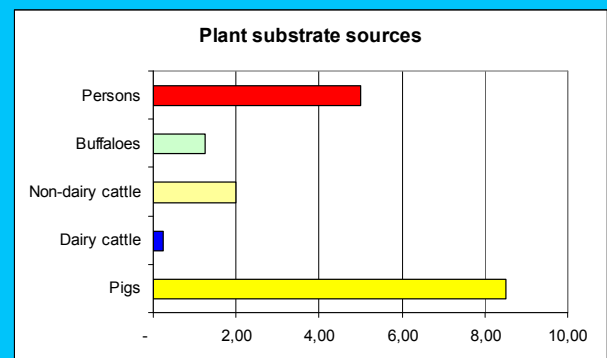
- Urban: 44% biomass
- Rural: 90% biomass



Biogas as domestic energy source

Typical biogas plant:

- Fixed dome
- Investment ~ € 250

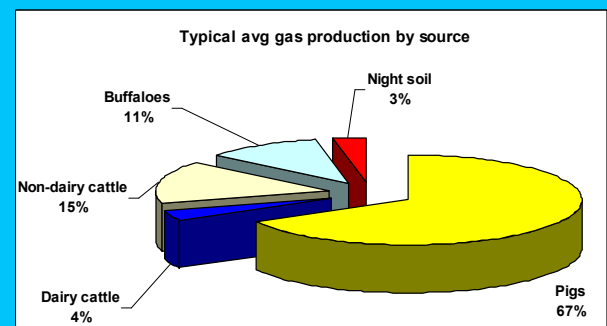


Biogas production:

- ~ 900 m³ / plant / year

Energy generation:

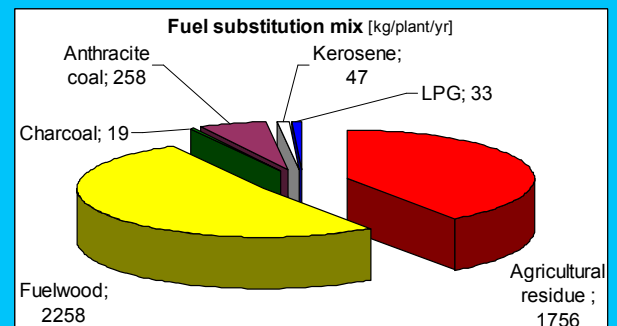
- 21,000 MJ / plant / year



Biogas – fuel substitution

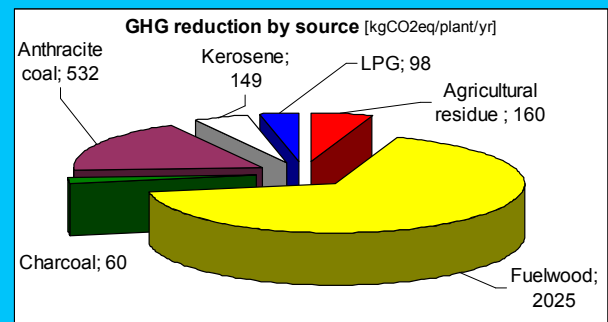
Fuel substitution:

- Agric residue 1756 kg
- fuelwood 2258 kg
- Charcoal 19 kg
- Anthracite coal 258 kg
- Kerosene 47 kg
- LPG 33 kg



GHG reduction (fuel substitution):

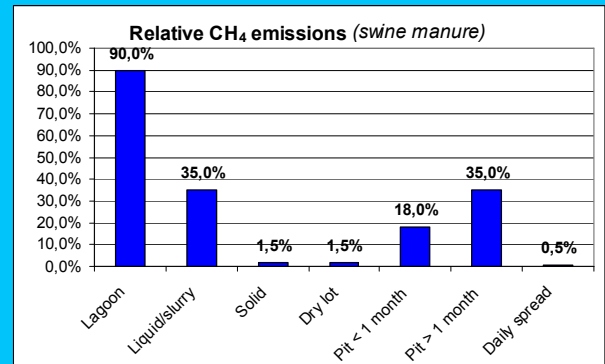
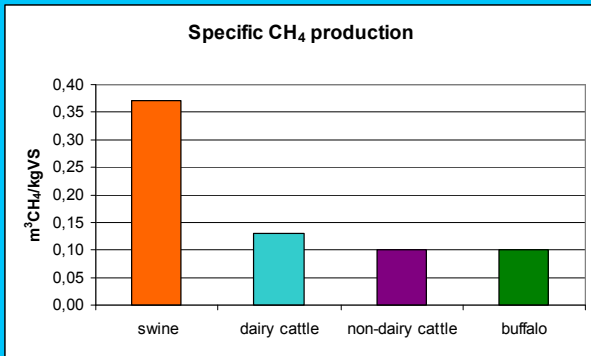
- 3 t CO₂ eq / plant / year



Manure management

Methane emission of manure management depends on:

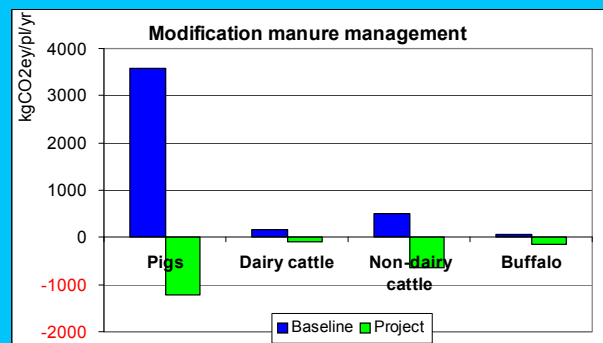
- Type of manure
- Handling practice.



GHG reduction manure management

Emissions / plant / year

+ "Baseline":	4.3 tCO ₂
- Project:	2.1 tCO ₂
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= Reduction:	2.2 tCO ₂



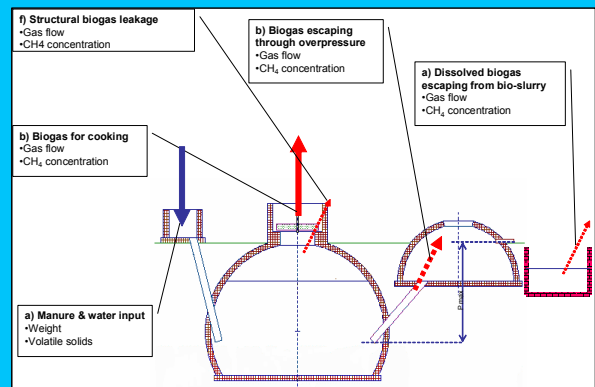
Leakage

IPCC for biogas 5 – 10%

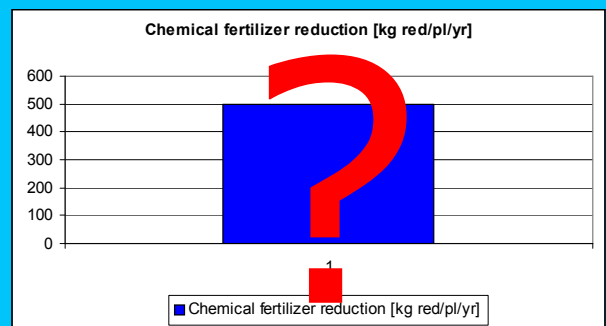
Calculations: 15%

Depending on:

- Feeding / size ratio
- Temperature
- Construction quality



Chemical fertilizer substitution



Monitoring methodology (Mitsubishi Securities)

Actual GHG reduction:

- difference between **“baseline”** and **“project”**
- depends on practices **on the farm.**

Baseline monitoring meth:

- One-off census (pre-project)
- One year – 10 plant sample

Parameters

- Livestock type and population
- Avg weight livestock
- Household population
- Manure mgt practice
- Farming pattern
- Fuel use (mix)

Project monitoring meth:

- One year – 100 plant sample
- Annual census

Parameters

- Leakage
 - Structural (workmanship)
 - Over-production
 - Post-fermentation
- Activity levels
 - Operation
 - Utilisation



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GHG reduction summary

GHG red. ~ **5 tCO₂eq/plant/yr**
 CER price ~ **€ 6 / tCO₂**
 Cred. period **10 yr**

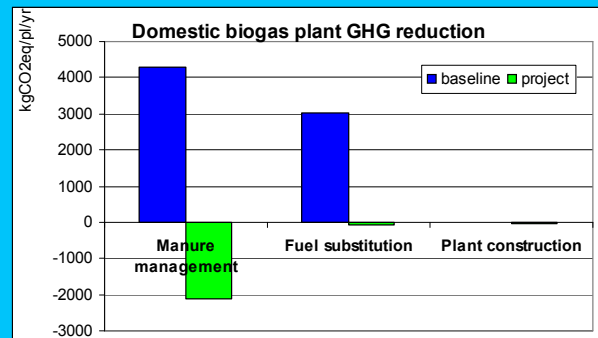
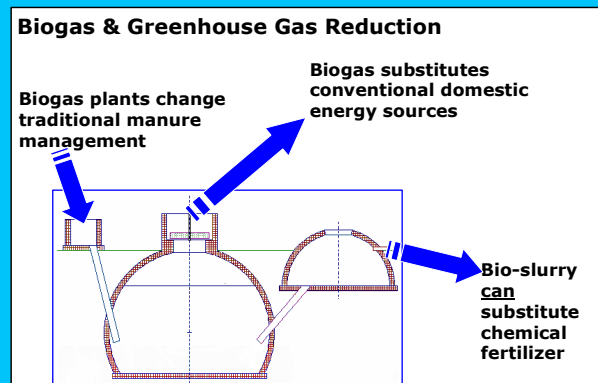
CER revenue / plant:
€ 300.

Vietnam Biogas Project phase II:

Period = **5 years**
 Target = **180,000 plants**

CER revenue BP II total:

€ 46.3 million



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However ... :

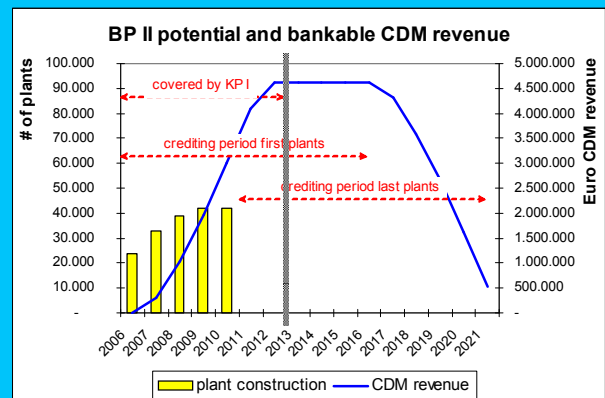
Payment up on delivery:

CER payment only **after** investment, **after** verification.

KP 1st commitment period:

- 2008 – 2012
- CER's after 2012 not (yet) bankable for loan servicing.

**BP II "bankable" CER forecast:
~ € 16.7 million (36% of total)**



Investment

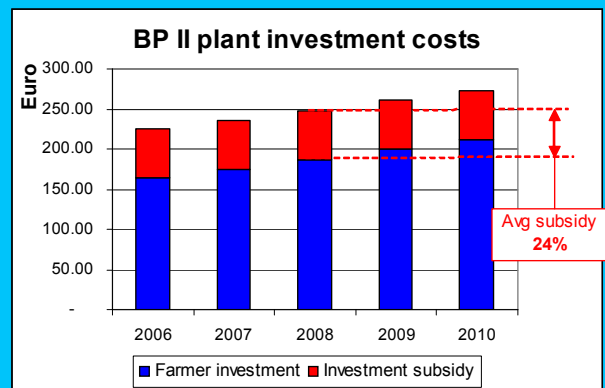
“Typical” biogas plant

Size **8m³**
Price **€ 250**

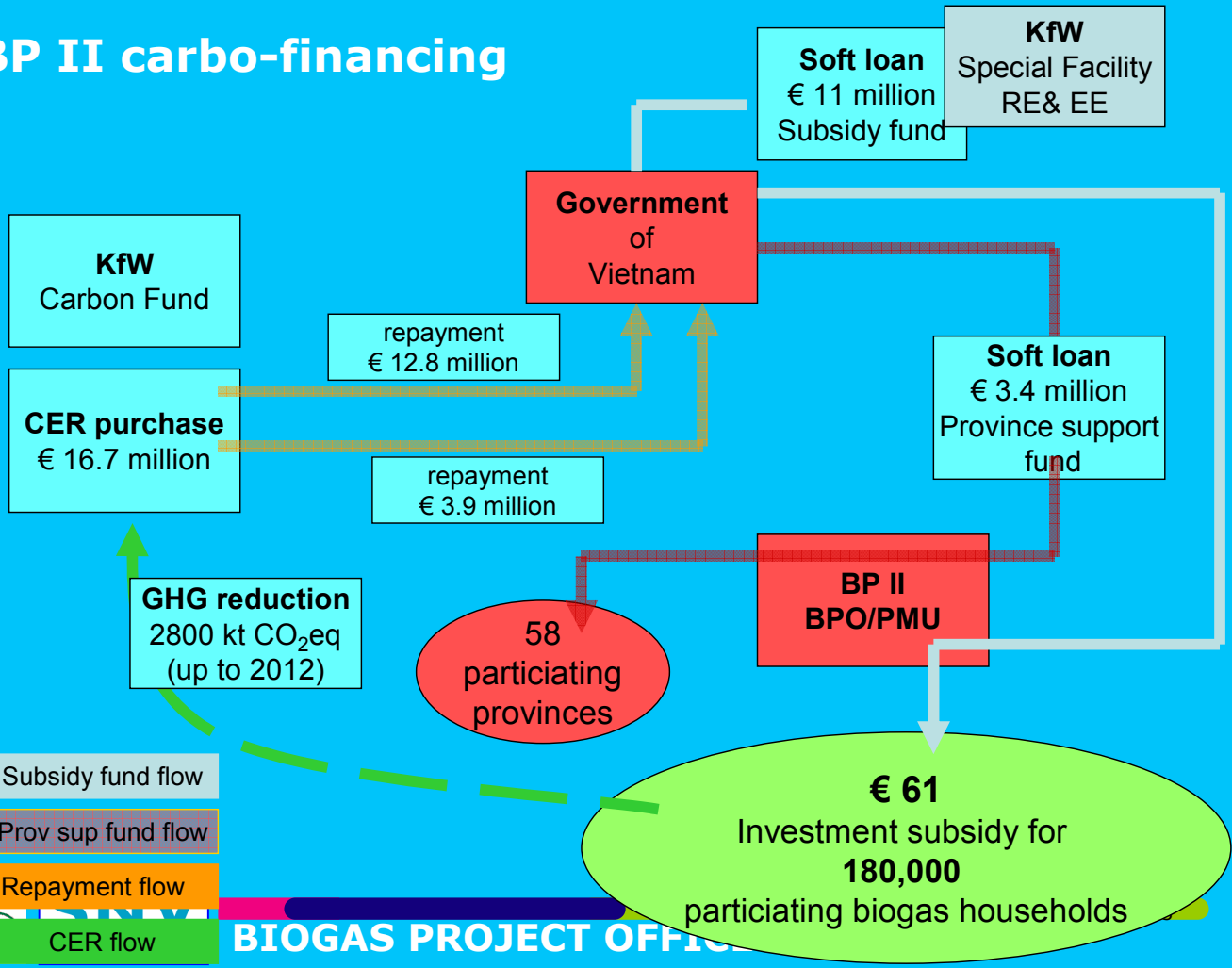
Three “flat rate” subsidy levels

Normal: **€ 50**
Medium: **€ 75**
High: **€ 100**

Average : **€ 61**

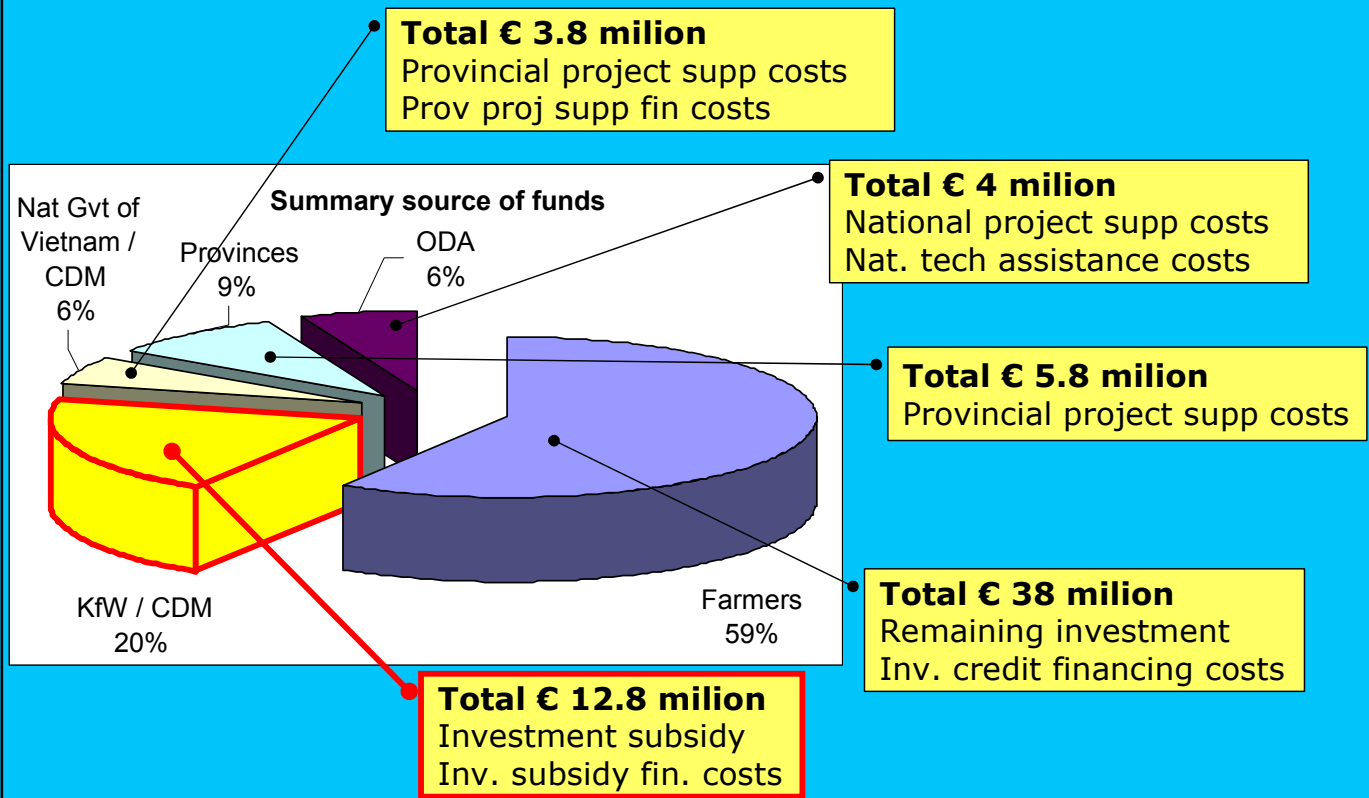


BP II carbo-financing



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BP II project financing



Thank you for your attention

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