Methane to Markets

Landfill Subcommitte Meeting

Monterrey, México

27-29 January, 2009

Using Landfill Biogas to Fuel a Pyrolisis Furnace for Medical Waste in Argentina

Facultad de Ingeniería

Universidad Nacional del Centro de la Provincia de Buenos Aires - UNICEN

Contents

Background of the group

Background of the project

- Engineering Design
- The CDM Experience
- Economy of the Project
- Community Development Plan
- Impacts of the Project

Second phase: the energy use of LFG

- Project Design
- Equipment & Infrastructure
- Economy of the Project
- Financial Sources
- Expected Impacts

Background of the group

I&D Renewable Energies: biomass, wind energy, solar

Capacity Building: Courses , Workshops, Seminars

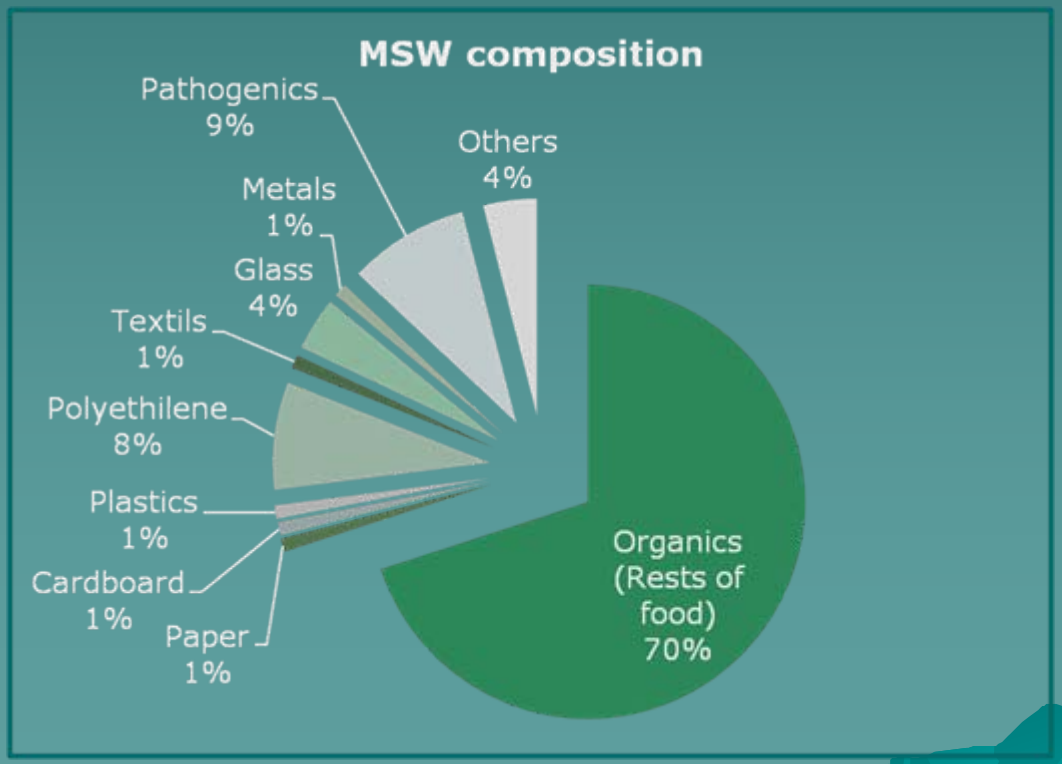
Consulting Services on:

- **MSW Management Assistance**
- **CDM Development Projects**
- **EIA**
- **Feasibility studies on MSW management, Renewable Energies, CDM, GHG mitigation**

Background of the project

Olavarría MSW management based on landfill design since 1998

Feasibility study developed in 2002 by UNICEN



100,000 in-habitants
90 ton MSW/day

Evolution of LFG project

Feasibility Study

Electric Energy Generation

Low prices of electricity
Complex regulatory market
Economic Indicators

Direct use of LFG

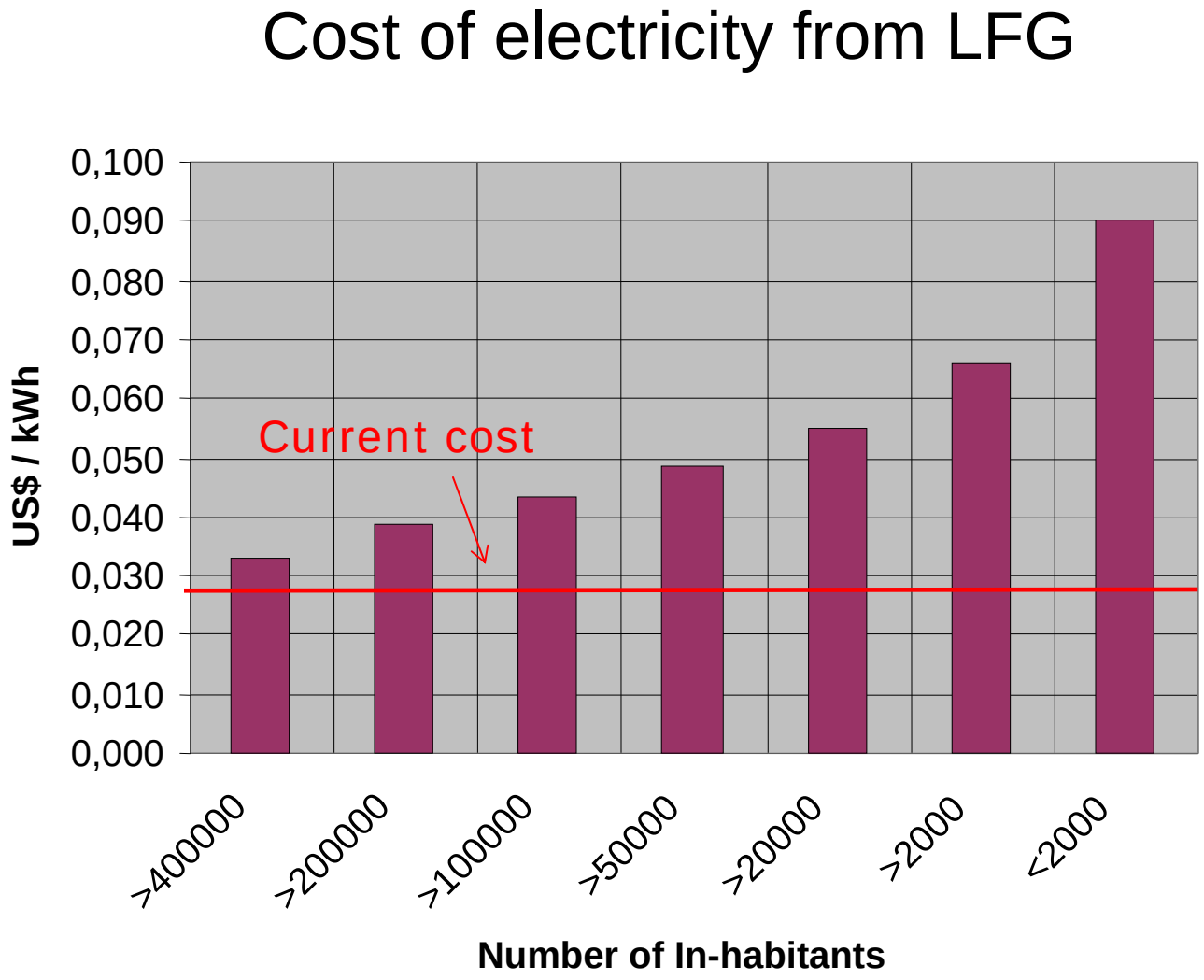
Low prices of NG
High availability of NG
Absence of users in the nearby
Economic Indicators

Capturing and Flaring of methane

Plant of LFG

Community Plan

Example of Economic Indicator

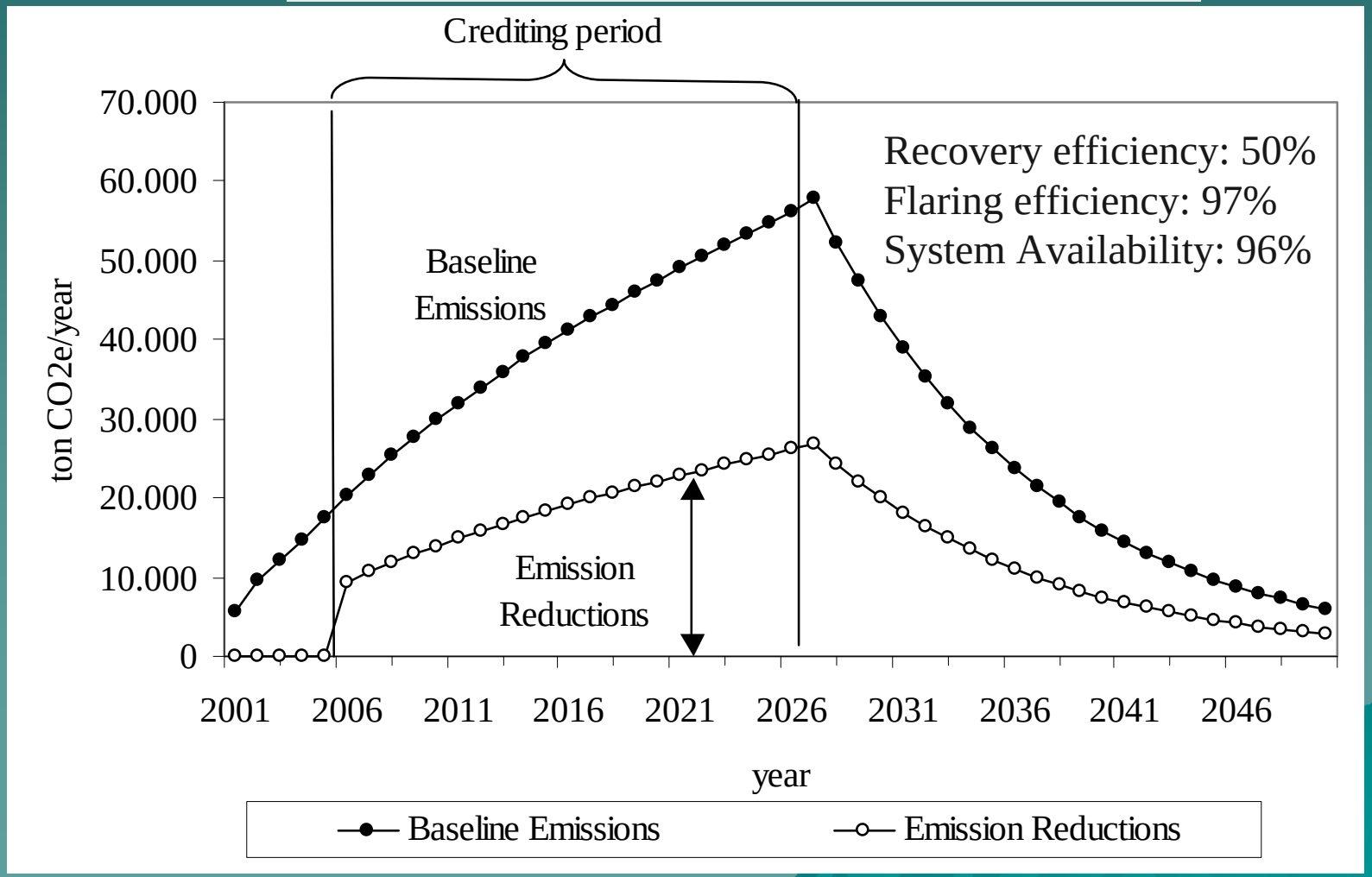


Organization of the project development

- Agreement between Municipality of Olavarría and UNICEN
- UNICEN as developer of:
  - LFG plant engineering design
  - CDM project cycle
  - ERPA negotiations
- Technical Assistance of CDCF World Bank
- Biding process at national level
- O&M biding process at local level
- Development of the Communitary Plan for a rural county

Preliminar estimation of LFG potential generation

$$CH_4 = \sum_x A \cdot k \cdot MSW_T(x) \cdot L_o \cdot e^{-k \cdot (t-x)} \cdot RE$$



Engineering Project Design

- **Extraction and transport system**
  - Extraction wells
  - Wellheads for LFG measurement & control
  - Pipelines and Fittings
- **Vaccuum system**
  - Blowers
  - Valves and fittings
- **Flaring system**
  - Closed flare
  - Control system
- **Condensates management**
  - Condensate traps
  - Knock-out
  - Pumps and transport pipelines

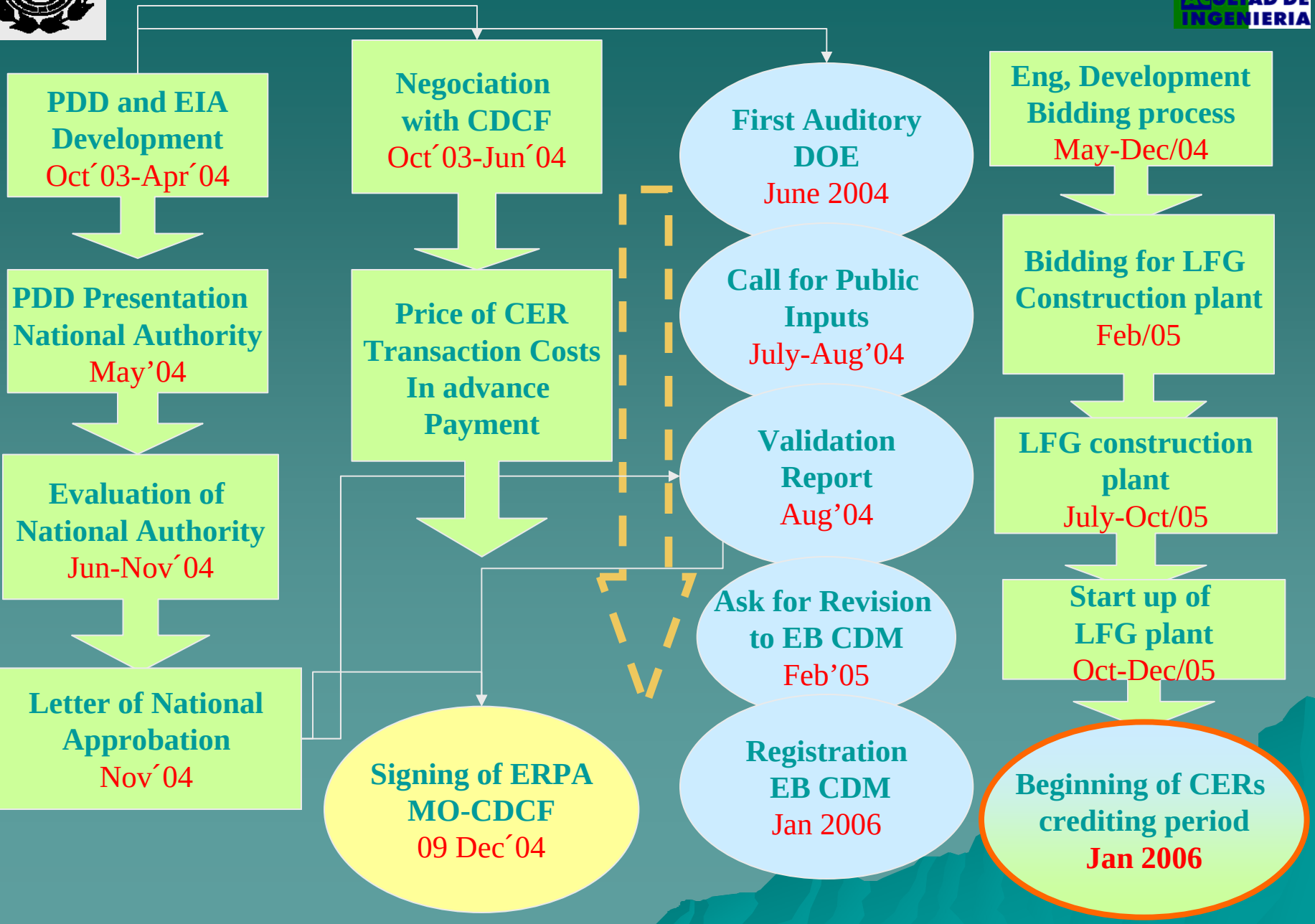
Plant Construction

Plant Construction

CDM project cycle

- **Additionality**
  - Environmental
  - Legal
  - Other barriers: Institucional, Financial, Technological
- **Baseline (ACM001)**
  - Current situation (passive vents of LFG to atmosphere)
  - FOD model for LFG potential generation rate
- **Emission Reductions**
  - Direct measurement of captured methane
  - Direct measurement of non burnt methane
  - Application of ACM0001 full scale
- **Monitoring Plan**
  - Measurement variables and protocols
  - Control Quality
- **Call for public inputs**

CDM project cycle



Community Development Plan

- Espigas county:
  - –550 in-habitants
  - –80 km from Olavarría city
- Installing of a **safe water network**
- Installing of a **solar system for water heating** at the local hospital as a pilot experience

Safe water...

Safe water...

Tank 50 m3 capacity

Capturing well 60 m deep

4000 m pipelines

160 households

connected to the new

network (almost 100%)

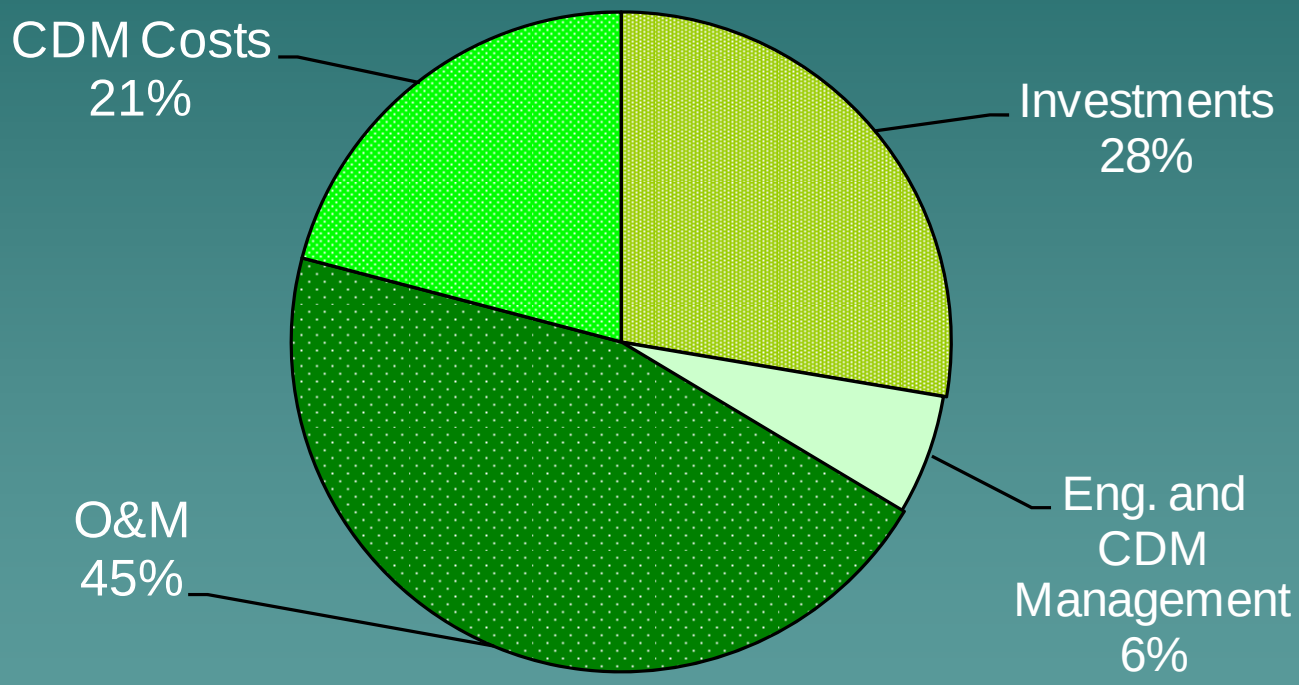
Heating water...

Solar system at the hospital

35-40% GLP sustitution for heating water

10-15% sustitution of total consumption LPG

Economy of the project



Total Costs (21 years) at NPV year 2005: US$ 640,000

Impacts of the Project

- **Environmental**
  - Reduction of GHG emissions
  - Mitigation of odors
  - Reduction of exploition risks
- **Social**
  - Development of local technology
  - Use of local hand labor
  - Improvement of quality life of a rural community
- **Others**
  - Availability of LFG as energy resource
  - Development of capacity building at local level
  - Awareness on climate change, and potential renewable sources of energy from proper MSW management

Los concejales de Legislación fueron a la Facultad de Ingeniería para conocer un estudio técnico anualizado

Más alternativas para la basura loc

EL POPULAR | Lunes 9 de junio de 2003

Olavarría busca generar gas o electricidad y así adherir al P

Con las energías pu

económico

Los concejales que analiza
cómo son los estudios real
constituyen una novedad.
cambiar el sistema de rec

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Lunes 22 de setiembre de 2003 | EL POPULAR

BIOGAS. Otro avance en las gestiones del Municipio e Ingeniería ante el Banco Mundial

La basura de Olavarría

Seria el prim

Funci
Olava

Represent
Banco
expertos
Ambiente
Olavarría. El
la visita es rec
terreno, in
sobre la ex
local en m
residuos
analizar
convenio que
aprovechar
del relleno
para r
emisiones de
que se ger
concretarse, se
primer proyecto de
género en la Arge
y el tercero posib

Jueves 23 de junio de 2005 | EL POPULAR | 9

EL POPULAR

Directora: Graciela María Pagano | Año 105 - Nº 33.215 | 40 páginas | Olavarría, viernes 10 de diciembre de 2004 | Precio $ 1,40

Se pretende reducir la emisión de gases de efecto invernadero

Se firmó el convenio con el Banco Mundial por el biogás

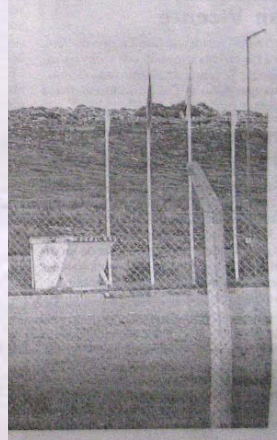
El convenio es para el financiamiento de la conversión de gas del relleno sanitario. El Municipio construirá una planta para la captura del biogás y para la red de agua potable en Espigas, ya que el acuerdo contempla un proyecto de compromiso social. En el futuro, la reducción de gases que afectan al medio ambiente permitirá a Olavarría vender "bonos verdes" a otras naciones y así recuperar el costo de la inversión. Una iniciativa que apunta a colaborar en la protección del planeta.

Página central

Helios Eseverri y Ken Newcombe, garante del Fondo del Carbono del Banco Mundial, se saludan tras la firma del acuerdo

gás

ue se genera en
eer de agua potable



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Info

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BIOGAS. El Municipio firmó un convenio co

"Olavarría e
reducción de

El Municipio y el Banco Mundial firmaron ayer un
invernadero. En rueda de prensa, Olavarría fue d
en la construcción de una red de agua potable e

Los residuos pueden generar bonos verdes.

Así, la reducción de emisiones obtenida por un proyecto como el de Olavarría se tradu-

Parte de los fondos así obtenidos serán utilizados para crear una red de agua potable en la localidad de Espi-

Barriers overcome

- Demonstration of a new activity related to MSW and renewable energy source
- Mitigation of GHG and certification of the project under a global mechanism
- Demonstration of the benefits of a proper MSW management
- Implementation of local technology and human resources for LFG development projects
- Improving the quality of life of a population

Barriers to overcome

- Generate models for the prediction of LFG potential based on local data
- Improve the procedures of landfill operation and capacity building for LFG capturing and use
- Promote a legal framework that help the development of LFG projects of capture and use as a renewable energy resource
- Searching of mechanisms that facilitate the adquisition of monitoring equipment for quality control and CDM procedures
- Promote the capacity building on LFG technology, human resources and engineering development

2nd phase: the present

- Identifiy and develop activities for the energy utilization of the LFG captured
- Transfer the knowledge and the gained experience for the developing of other projects in the region

The present

Use of the LFG as fuel for pyrolisis furnace for the treatment of medical wastes

Expansion of the capturing system to the current cell under operation

Adaptation of the system to the new operative requirements

Project Scheme

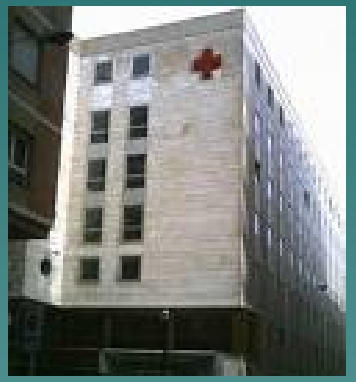
Medical wastes from…

Municipal Hospital

+

26 municipal sanitary posts

+



3 private medical centers

=

5 ton / month

Energy balance

Furnace

16 m^3/h NG

620.000 kJ/h

35 % (Cell 1)

0 % (Cell 1+2)

35 m^3/h (Cell 1)

408.000 kJ/h

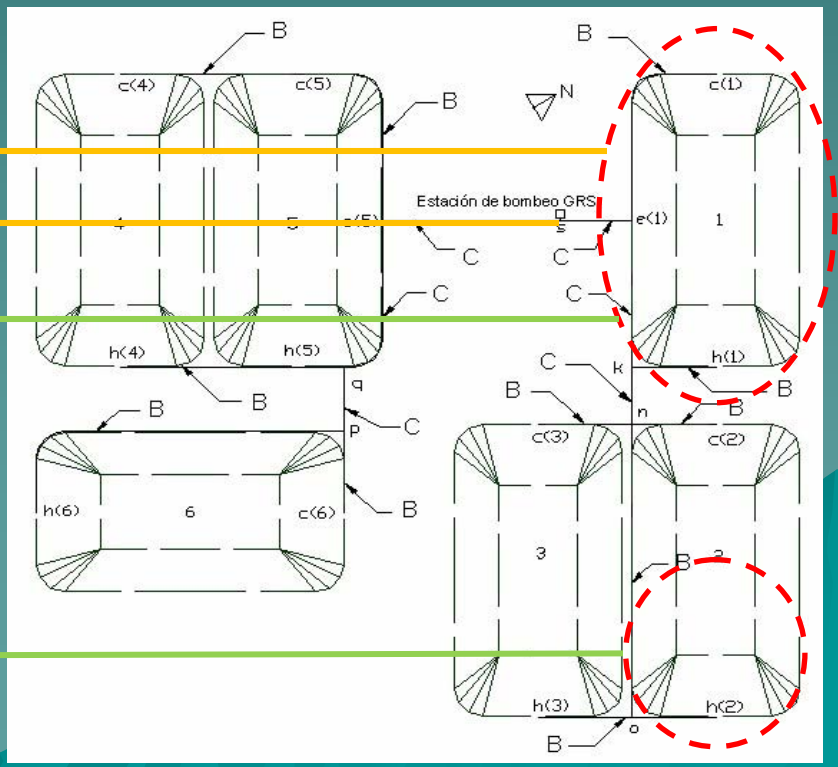
50 m^3/h (Cell 1+2)

620.000 kJ/h

Flare

Burning of LFG

Burning of LFG

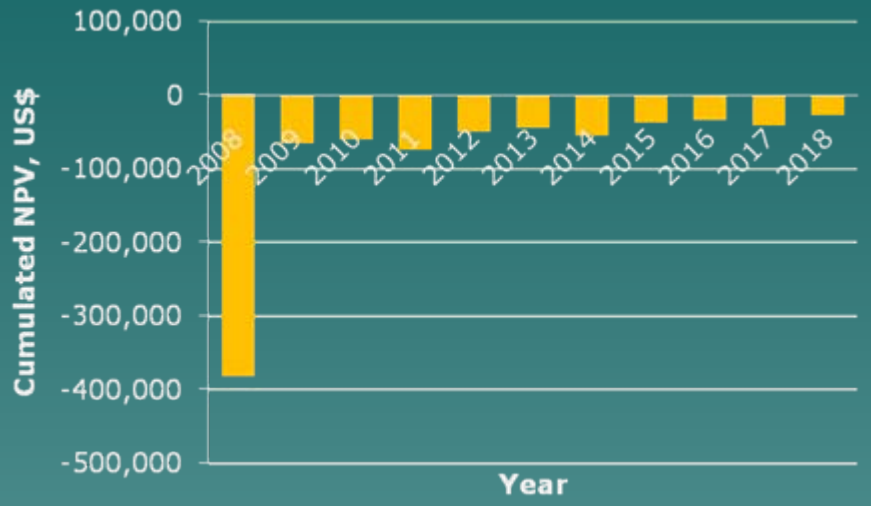


Economy of the project

Investment Costs = US$ 450,000

O&M Costs = US$ 125,000

Incomes = US$ 48,000



Financial Sources

EPA

+

Municipality of Olavarría

+

UNICEN

+

National Secretary of Environment

Project 2008-2010: "LFG Used as Pyrolisis Furnace Fuel": US$ 150,000

Civil works US$ 300,000

Eng. & Design US$ 25,000

Lab of Environment Advance Techs

?

Equipment and Civil works US$ 300,000

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Thank you for your attention

Contacts:

Estela Santalla
esantall@fio.unicen.edu.ar

Gabriel Blanco
gblanco@fio.unicen.edu.ar

TE/Fax: 02284-451055 (Int 279)