

# **Landfill Gas To Energy Project (LFGTE) and CDM in Asia and The Pacific Region**

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# Bionersis background



- French company, incorporated in 2005
- Shareholders: Founders (50%), Galiléo (French Environment Investment Fund – 25%), New Energies Invest (private Swiss fund – 24%) and others (1%)



**Strong & committed financial back up**

- Founders have an efficient and comprehensive background in energy and environment related project development and financing (more than 15 years of experience)
- Bionersis is currently in the process to be floated on the French Stock Exchange
- Bionersis has offices & subsidiaries in Chile, Panama and Thailand



# Bionersis activities



- **Company involved in renewable energy activities - develop Landfill Gas To Energy projects (LFGTE)**
- **Pure player and first mover for the general utilization of the biogas (landfill gas in particular)**
- **the company is developing projects in Thailand, Malaysia, Chile, Cuba, Ecuador, Colombia and Peru**
- **Niche market: activities focused on medium scale landfills (500T/day) and mostly in Developing countries which are signatories of the Kyoto Protocol**
- **Project development is done in two successive phases (flare only during the Phase I to monitor the LFG quantity and quality in order to choose the best utilization with the Municipality in the PhaseII)**



# Why landfill gas? And How is the LFG collected and used?



**LFG is made up by:**

- ~ 50% methane ( $\text{CH}_4$ ),
- ~ 48% carbon dioxide ( $\text{CO}_2$ )
- <2% non-methane organic compounds (NMOCs)

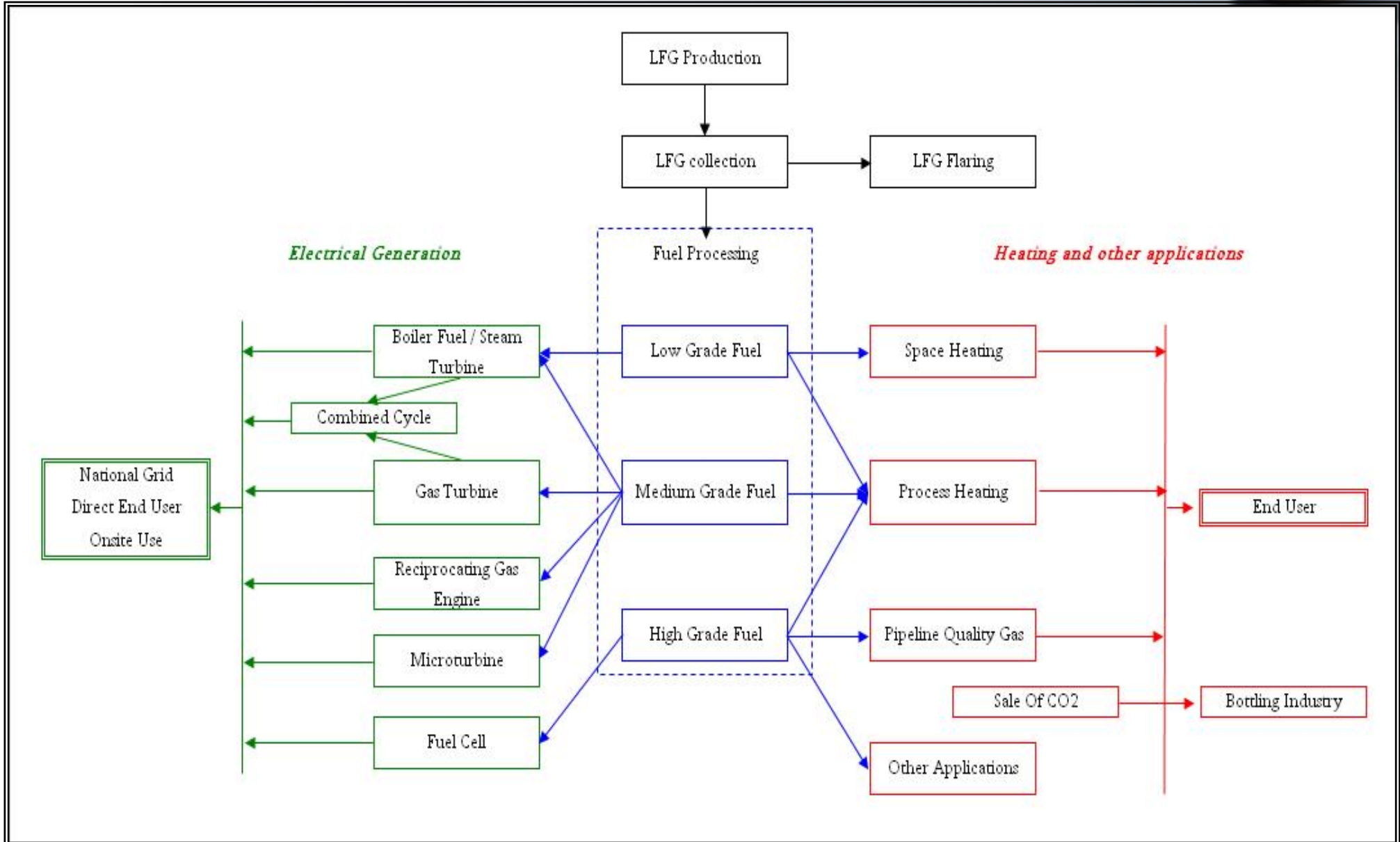
**LFG is a serious problem:**

- Risks of fire and explosion
- Health hazards associated with traces gases (benzenes and family)
- Odor nuisance

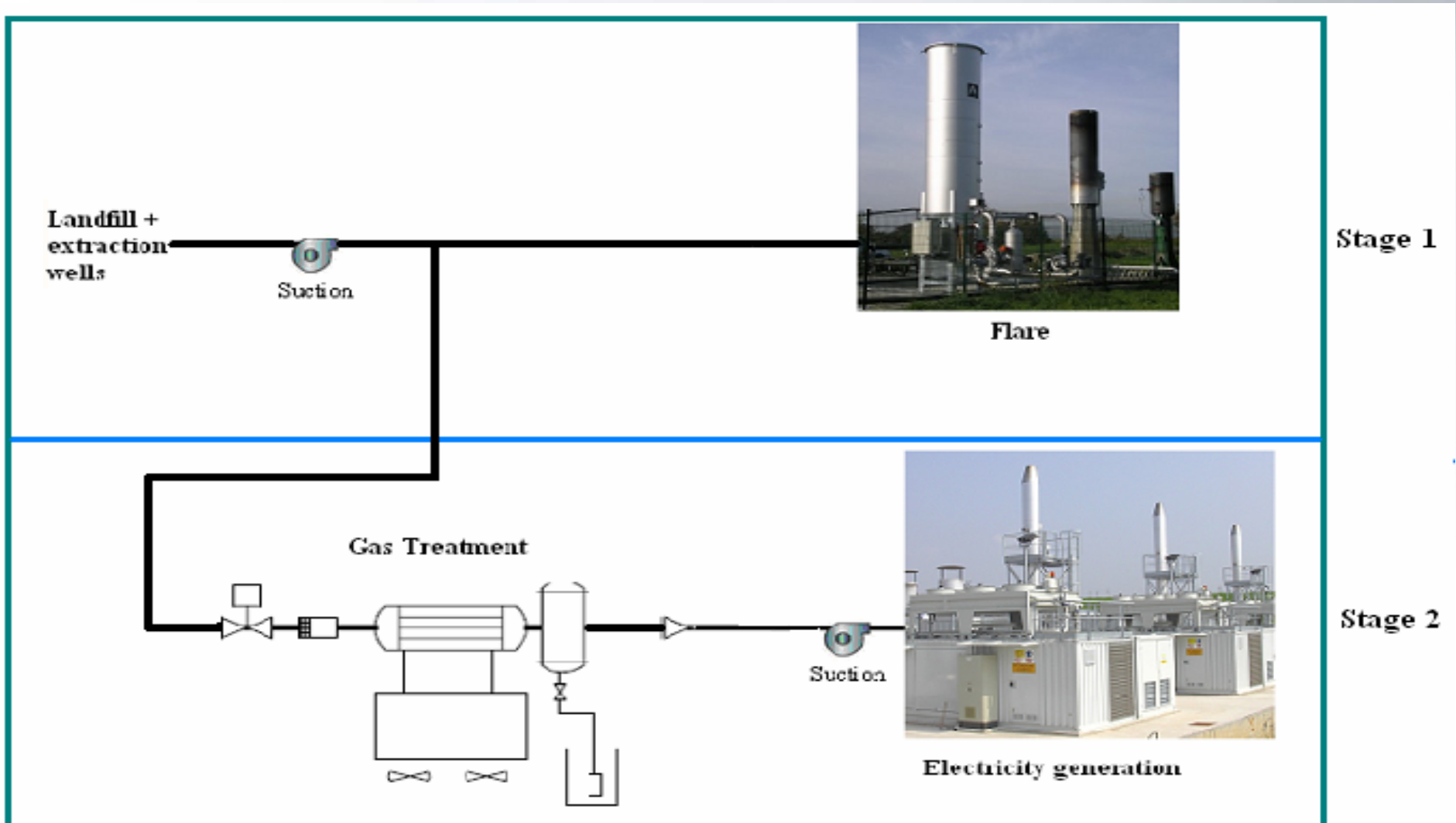
**A typical LFG collection system**

- LFG collection system;
- Collection piping;
- Condensate drop-out and disposal system;
- Blower system ;
- LFG flare;
- The most common way to utilize the LFG is to generate electricity (i.e. Landfill Gas To Energy project – LFGTE).

# Which utilization for the LFG?



# General Design of a LFGTE





- **Destroy methane and other organic compounds in LFG**
  - Reduce greenhouse gas (GHG) emissions
  - Reduce odor nuisances and local air pollution
  - Reduce risks of explosion and fires
  - Reduction of landfill gas subsurface migration
- **Offset use of nonrenewable resources (coal, oil, gas) reducing emissions of:**
  - $\text{SO}_2$  contributes to acid rain
  - $\text{NO}_x$  contributes to ozone formation and smog
- **Contribute to a safer closure of the landfill**



- Exposure of landfill workers and local communities to Hazardous Air Pollutants will drop significantly reducing the health hazards caused by such substances (cancerous illnesses, respiratory irritation, and central nervous system damage). In addition, explosion hazards will also be reduced contributing to safer operations on still opened part of the landfill area
- Reduction of odor dissemination
  - improves quality of life for individuals;
  - Enhances local property values;
- Implementation would require that 5 to 20 persons are employed to fulfill duties and construction of the system generating directly and/or indirectly net employment opportunities for the local communities





- Turn waste into a resource – landfill gas into electricity. Improve country's energy self-sufficiency
- The reduction of odor may improve the local property values while the land will be reused faster thanks to the safe closure of the landfill
- Technology transfer: local entities will be able to duplicate the project through the country
- Create direct and indirect revenues:
  - Increase the regional output by over \$1,200,000 during the construction phase and more than \$250,000 during the operational phase
  - Offset of costly fossil energies by renewable energy





# Support of Bionersis to Local Governments



- For landfills eligible to Bionersis' criteria, we propose to turn the liability (LFG) into revenues for the benefit of the local communities and of the environment
- We develop projects under a BOO model: Bionersis will finance and install all requested equipment to collect and utilize the LFG and endorse all risks related to its quality and quantity
- No financial contribution would be requested from any local or national administration
- Bionersis and the Municipality will conjointly decide about the best final use of the LFG (revenues, image, community development...)



# Landfill after LFGTE implementation





**Thank you for your attention**

**For further information or inquiry,  
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**Have a nice day**

