

**PROJECT IDEA NOTE****A. Project description, type, location and schedule**

**Name of Project:** Recovery the "La Esmeralda" landfill gas to generate electricity and/or heat

**Technical summary of the project**      **Date submitted:** 29 March, 2005

<b>Objective of the project</b>	Extract, capture and channel the methane gas generated on the "La Esmeralda" landfill, for its later treatment or use, looking for contribution at the mitigation of consistent greenhouse effect.
<b>Project description and proposed activities</b>	Extraction and capture of methane gas through chimneys constructed with stone and wire mesh, of one meter per one meter of section, located on the surface of every cell, to avoid gas escape; the gas will be channeled through hoses or pipes until an unique place where initially will be a treatment system that would use the gas like a power source (avoiding methane gas emissions) to obtain electric energy that would serve in public lighting. Another option consists in use the gas like fuel to our oven incinerator of biomedical and hazardous wastes, placed on our installations.
<b>Technology to be employed</b>	<p>The technology is divided in each one of the sections that the project has. First it corresponds to the necessity to have systems for the harvesting of gases generated in each one of the cells, which includes: construction of exit channels for the gas ventilation, equipment of suction and control of the gas, and pipes of conduction of this until the temporary storage device.</p> <p>The second part corresponds to the system of temporary storage which includes elements of measurement of variables such as pressure gauges, measurers of flow and equipment of chromatography to evaluate qualities and composition of the gas. This aspect also includes conduction channels until each one of possible stations of advantage.</p> <p>Third it is divided in two possible stages, first it corresponds to the system of generation of electrical energy which includes the use of a motor of internal combustion with gas (methane), a system of connection to a electric generator, complemented with equipment for the electrical regulation of the produced energy, also given the purpose of the project, it requires of the assembly of the infrastructure for the conduction of the electricity (towers and wiring) as well as the systems of illumination (lamps and posts). The second stage corresponds with the possibility to use the gas in the combustion in the incineration oven, which includes conversion of the equipment at level of burners and systems of regulation of pressure and volume (actually this equipment use natural gas).</p>

<b>Project developer</b>	
Name of the project developer	<b>EMPRESA METROPOLITANA DE ASEO S.A. E.S.P. EMAS</b>
Organizational category	Private company

Other function(s) of the project developer in the project	Sponsor
Summary of the relevant experience of the project developer	<p>EMAS is a company who render the cleanliness home public service in Manizales city and other cities of Caldas Department, on its components of sweeping, collection, transport and final disposal of ordinary solid wastes. EMAS comes operating since 1.995. Since 2.001, EMAS render also the collection, transport and incineration (by mean of an oven incinerator placed in the same property where the landfill is located) of biomedical and hazardous wastes generates on many cities of the country.</p> <p>EMAS is certified on management quality system at all its activities. Its mission is to render the services with the elements and staff required, guaranteeing respect for environment and completion of legal rules. Its vision is to continue like a company leader in sector, concerning about training and welfare of its employees and the strict completion of legal obligations, looking for supply services that satisfy customer needs.</p>
Address	Kilómetro 2 Vía a Neira, Relleno Sanitario La Esmeralda, Manizales - Caldas - Colombia.
Contact person	Gabriel Hernán Ocampo Mejía (EMAS Manager) Maria Luisa Arbeláez Patiño (EMAS Technical Director)
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E-mail and web address, if any	emas@epm.net.co emaste@epm.net.co
<b>Project sponsors</b>	
(List and provide the following information for all project sponsors)	
Name of the project sponsor	<b>EMPRESA METROPOLITANA DE ASEO S.A. E.S.P. EMAS</b>
Organizational category	Private company
Address (include web address, if any)	Kilómetro 2 Vía a Neira, Relleno Sanitario La Esmeralda, Manizales - Caldas - Colombia.
Main activities	<ul style="list-style-type: none"> <li>▪ Management of the "La Esmeralda" landfill.</li> <li>▪ Sweeping, collection, transport and final disposal of ordinary solid wastes in the Manizales city.</li> </ul>
Summary of the financials	Isn't available
<b>Type of the project</b>	
Greenhouse gases targeted	CH <sub>4</sub>
Type of activities	CO <sub>2</sub> Sequestration
Field of activities	Waste management
	Capture and use of landfill gas (methane) emissions.
<b>Location of the project</b>	
Region	South America
Country	Colombia
City	Manizales
Brief description of the location of the project	Manizales city is located in the center of the country, with near to 400.000 inhabitants, temperature average of 18°C. "La Esmeralda" landfill is placed near to the city (2 km) and has 54 Hectares of area.
<b>Expected schedule</b>	
Earliest project start date	Year 2005
Estimate of time required before becoming operational after approval of the PIN	Time required for financial commitments: 3 months Time required for legal matters: 2 months Time required for negotiations: 2 months

Expected first year of verified Emission Reduction or CER / ERU delivery	Time required for construction: 6 months Year 2006
Project lifetime	25 years
Current status or phase of the project	Pre-feasibility study finished
Current status of the acceptance of the Host Country	Letter of No Objection is available
<b>The position of the Host Country with regard to the Kyoto Protocol</b>	The Host Country signed and ratified the Kyoto Protocol

### B. Expected environmental and social benefits

<b>Estimate of Greenhouse Gases abated / CO<sub>2</sub> Sequestered (in metric tons of CO<sub>2</sub>-equivalent)</b>	Annual: approximately 114.458 tCO <sub>2</sub> -equivalent Up to and including 2012: approximately 455,000 tCO <sub>2</sub> -equivalent Up to a period of 10 years: approximately 668,000 tCO <sub>2</sub> -equivalent Up to a period of 7 years: approximately 455,000 tCO <sub>2</sub> -equivalent Up to a period of 14 years: approximately 874,400 tCO <sub>2</sub> -equivalent
<b>Baseline scenario</b>	<p>At the present time the gas generated by the landfill is ventilated to the atmosphere without any type of control, and having quantified by approaching the amount of gas that leaves. Given the connotation of production of the gas, this it contains a high methane level present (substance that generates greenhouse effect) which it is not used and less is burned like control measurement. The legislation only demands that the gas be ventilated to the atmosphere and does not define aspects to its use or control. Also in the operation of the landfill other power sources are used such as electricity and natural gas, that they can be associated to greenhouse gas emissions.</p> <p>In case of not executing the described activity in the project the methane emissions would continue existing during a period of approximately 25 years arriving at a volume of approximately 202.415.248 cubic meters. In the same way the use and advantage of the methane would imply to continue using other fuels like the natural gas in the different processes (oven incinerator) and/or use of electricity generated by other power sources, which would generate a certain level of emissions.</p> <p>The initially reduction only has been considered the option of the advantage of landfill gas, which preliminarily indicates in average of 3.046.916 ton CO<sub>2</sub>e during the entirety landfill life.</p>
<b>Specific global &amp; local environmental benefits</b>	
Which guidelines will be applied?	Document CONPES 3242 (Institutional Strategy for Climatic Change Mitigation Sale of Environmental Services, Climate Change Policy, July 2002). Law 142 of 1.994 – Ministry of Economic Development Decretory 1713 of 2.002 – Ministry of Environment, Housing and Territorial Development.

	Resolution 1045 of 2.003 – Ministry of Environment, Housing and Territorial Development.
Local benefits	The implementation of the Project to mitigation and use of "La Esmeralda" landfill gas, will benefit at the near community, firstly whereas won't have dispersal offensive noise that can arrive at inhabited zones, second, because the development of the infrastructures will can a source of employment for the communities seated in the influence area, and third because to be feasible the advantage from the energy for external illumination, it would provide greater security and welfare to the inhabitants of the zone. In addition to the previous thing, the project would attract visitors interested in the application of this type of projects in other landfills, what would constitute to us like a model at national level.
Global benefits	<ul style="list-style-type: none"> <li>▪ Diminishing of the greenhouse effect or climatic change.</li> <li>▪ Environmental improvement of the quality of the air.</li> <li>▪ Conservation of the natural resources.</li> <li>▪ Community development.</li> </ul>
<b>Socio-economic aspects</b> What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project? Indicate the communities and the number of people that will benefit from this project.	<p>Without the project exists: dispersion of injurious gases to the atmosphere, illumination of the site with other energy sources like an electrical energy, oven operation with natural gas provided through a domiciliary network, nocturnal dark in some bordering zones.</p> <p>With the project there would not be dispersion of injurious gases to the atmosphere and with its capture and advantage could illuminate the project site and bordering zones, feed the oven incinerator at a very low cost, and reduce the salubrity problems.</p> <p>In the same way at the economic level, this project can to bring with himself for the community the investment of governmental money, foreign investment, employment generation, and support to microcompanies (during the construction stage).</p> <p>Benefited population:          15 direct employment.          5,000 neighboring inhabitants approximately.</p>
Which guidelines will be applied?	Document CONPES 3242 (Institutional Strategy for Climatic Change Mitigation Sale of Environmental Services, Climate Change Policy, July 2002). Law 142 of 1.994 – Ministry of Economic Development Decretory 1713 of 2.002 – Ministry of Environment, Housing and Territorial Development. Resolution 1045 of 2.003 – Ministry of Environment, Housing and Territorial Development.
What are the possible direct effects (e.g., employment creation, capital required, foreign exchange effects)?	<ul style="list-style-type: none"> <li>▪ Improvement in the performance of the company at financial level.</li> <li>▪ Promotion of the company at international level.</li> <li>▪ Improvement of the company at image level.</li> <li>▪ Guarantee of labor permanence.</li> </ul>
What are the possible other effects?	<ul style="list-style-type: none"> <li>▪ Experience and knowledge acquisition.</li> <li>▪ Institutional fortification.</li> <li>▪ Technical formation of outpost in the personnel.</li> <li>▪ Technical knowledge for the sector of remainders.</li> </ul>

	<ul style="list-style-type: none"> <li>▪ Transference of technology.</li> </ul>
<b>Environmental strategy/ priorities of the Host Country</b>	<p>Like national strategy, the state has come developing a series from exigencies that leave from a strong interest to promote improvements in the management of the solid remainders from their harvesting to their final disposition, involving to the direct and indirect actors of the process. The form to implement these changes has been presented by mean of the exigency of plans of integral management of remainders (PGIR's) that they look for in the specify case of the landfills, regulate and promote the optimization in the handling of the remainders and to diminish the possible contamination derived from these with a strong component of sustainable development.</p> <p>To align established in the CONPES 3242 with the aspects and own characteristics of the project, towards the mitigation of the climatic change.</p>

**C. Finance**

<b>Total project cost estimate</b>	
Development costs	US\$ 50.000
Installed costs	US\$ 150.000
Other costs	US\$ 20.000
Total project costs	US\$ 220.000
<b>Sources of finance to be sought or already identified</b>	
Equity	US\$ 30.000 EMAS
Debt – Long-term	US\$ 190.000 Santander Bank
Debt - Short term	US\$ 0
Not identified	US\$ 0
Carbon finance contribution sought	US\$ 0

Illustrative project categories and examples include:

<b>Code</b>	<b>Afforestation and reforestation<sup>1</sup></b>
<b>1</b>	Rehabilitation of degraded tropical lands (e.g. Imperata grasslands) to
<b>1a</b>	forest
<b>1b</b>	Agroforestry
<b>2</b>	Reforestation of degraded temperate grasslands or arid lands by tree planting
<b>3</b>	Establishing tree/shade crops over existing crops (e.g. coffee)
<b>4</b>	Plantations for wood products
<b>4a</b>	Small scale landholder driven
<b>4b</b>	Commercial escale
<b>5</b>	Landscape rehabilitation through planting corridors etc
<b>6</b>	Fuel wood plantings at a commercial scale
	<b>Forest Management</b>
<b>7</b>	Improved forest management via fertilizer, in-plantings etc
<b>8</b>	Improved fire management
<b>9</b>	Reduced impact logging
<b>10</b>	Alternatives to fuel wood for forest/environmental protection
	<b>Cropland management</b>
<b>11</b>	Reduced till agriculture
<b>12</b>	Other sustainable agriculture
	<b>Grazing land management</b>
<b>13</b>	Revegetation of semi-arid and arid lands with shrubs or grasses
<b>14</b>	Improved livestock management leading to vegetation and soil recovery
<b>15</b>	<b>Bio-fuels:</b> Use of biological residue to produce energy
<b>16</b>	<b>Other</b>

<sup>1</sup> This is the only class of activities accepted under the CDM for the first commitment period