

CDM in Peru

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«Quitaracsá» Hydropower Project

The project Quitaracsá I is located in the central Andean region of Peru, 500 km to the north-east of the Lima city, at an altitude of 1,465 m. It takes the advantage of the natural flows of the Quitaracsá river which is a tributary of the Santa river and converges with this immediately downstream the location of the existent plant of Cañon del Pato (250 MW). The Project's installed capacity and projected yearly average generation is 112 MW and 595.65 GWh, respectively. The expected load factor is 59.4%. The Project is expected to displace 324,034 tCO₂e per year, which accounts for 2,268,235 tCO₂e for the first crediting period (7 years), generating the equivalent amount of Certified Emission Reductions (CERS).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«Quitaracsá» project will displace GHG emitted by thermal power plants of the national grid using diesel, residual (bunker), coal and natural gas.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric production with natural gas in combined cycle plants replacing most of the other plants with oil, of all types. National policies, sectoral policies and the new natural gas exploitation «Camisea» particular circumstance foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that «Quitaracsá» project will displace around 324,034 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The construction of the project it is planned to begin on the second semester of 2005. The operation is assumed to start in March 2008.

Estimate of time required before becoming operational

3 years

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

The Quitaracsá Power Station has the following authorisations and status

- Authorisation for the use of the water resources was given
- Environmental study approved
- Definitive Concession granted by Resolución Suprema N° 023-2002-EM 12th July 2002.
- Contract with the Peruvian Estate for Definitive Concession for indefinite time
- Feasibility Study completed
- Financing negotiations are not closed
- The letter of approval was issued in January 2005 by the Designated National Authority on CDM.
- The project is under the validation process with a designated Operational Entity.

Estimated Emission Reductions

Annual: an average of 324,034 tCO₂-equivalent.

- Up to and including 2012: 1,296,134 tCO₂e
- Up to a period of 10 years: 3,240,346 tCO₂e
- Up to a period of 7 years: 2,268,235 tCO₂e
- Up to a period of 14 years: 4,536,470 tCO₂e

Project Benefits

- The hydroelectric plant will use the water resources available from the Quitaracsá River, producing cheap energy with low environmental impact comparing with the electricity generated from thermal plants.
- Generation of Hidro-electricity would allow rural communities, improving their economic and production activities.
- The project would create new jobs, develop the surroundings and in general would contribute to the economic growth to a big portion of the country by supplying more energy thorough the interconnection of the project to the national grid.
- «Quitaracsá» fulfil the environment norms through the approval of its Environmental Impact Study by the Ministry of Energy and Mines. The local farmers approved the project and have been well informed about the scope of the project.

Project Participant and Financing

Total project cost estimate:

- Civil Works: US\$ 39,500,000
- Machinery and equipment: US\$ 28,400,000
- Transmission lines: US\$ 7,500,000
- Other costs: US\$ 25,600,000
- Total project costs: US\$ 101,100,000

Sources of finance to be sought or already identified:

- Equity: 30% The project developer is looking for an investor
- Debt: 70%
- Carbon finance contribution sought: As much as we can have in advance.

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«La Virgen» Hydropower Project

«La Virgen» Project consists of a run of a river hydroelectric power plant of 64 MW capacity and it will produce an average net annual generation of 385 GWh.

«La Virgen» hydro power will be connected to the National Interconnected System (SEIN in Spanish) and will generate power for industrial and residential consumers not only for the center region of Peru but also for all the areas connected to the SEIN.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«La Virgen» project is regular size CDM project and will displace GHG emitted by thermal power plants using diesel, residual (bunker), carbon and natural gas as fuel from the national grid.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermolectric production with natural gas in combined cycle plants replacing most of the other plants with oil, of all types. National policies, sectoral policies and the new natural gas exploitation «Camisea» particular circumstance foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that «La Virgen» project will displace around 209,440 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The construction of the project is planned to begin on January 2006. The operation is assumed to start in 2008.

Estimate of time required before becoming operational

2 year and a half

What is the project lifetime?

30 years

Current status or phase of the project eg: which of the following phases have been completed:

- The feasibility study is available
- The environmental and archaeological impact studies has been already approved by the Ministry of Energy and Mining, and by the National Institute of Culture, respectively.
- The concession for the water use was given by General Administrative Procedure N° 044-201-DRA/J-ATDRP from the Ministry of Agriculture in may 22, 2001.
- Energy concession is in process
- Financing negotiations are not closed
- The letter of approval from the Designated National Authority on CDM is in process.

Estimated Emission Reductions

Annual: an average of 209,440 tCO₂-equivalent.

- Up to and including 2012: 1,047,200 tCO₂e
- Up to a period of 10 years: 2,094,400 tCO₂e
- Up to a period of 7 years: 1,466,080 tCO₂e
- Up to a period of 14 years: 2,932,160 tCO₂e

Project Benefits

• The hydroelectric plant will use the water resources available from the Yanango hydro power plant, producing cheap energy with low environmental impact comparing with the electricity generated from thermal plants.

• Generation of Hydro-electricity would allow rural communities, improving their economic and production activities.

• The project would create new jobs, develop the surroundings and in general would contribute to the economic growth to a big portion of the country by supplying more energy through the interconnection of the project to the national grid.

• «La Virgen» fulfil the environment norms through the approval of its Environmental Impact Study by the Ministry of Energy and Mines. The local farmers approved the project and have been well informed about the scope of the project.

Project Participant and Financing

Total project cost estimate:

- Civil Works: US\$ 21,360,816
- Machinery and equipment: US\$ 26,347,976
- Engineering and Administration: US\$ 3,504,115
- Total project costs: US\$ 50,744,926
- Taxes (IGV + Import Duties): US\$ 12,917,045

Sources of finance to be sought or already identified:

- Equity: 10 TO 15%
- Debt: 90 TO 85%
- Carbon finance contribution sought: As much as we can have in advance.

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«Central Graton» Hydropower Project

The proposed project is a small run-of-river hydropower plant located in Lima-Peru in the Rimac river basin in the San Mateo district. The purpose of the project is renewable electricity generation to be supplied to the National Interconnected Electric Grid ("SEIN"). The project's installed capacity and projected yearly average generation is 5 MW and 36,000 MW-hours, respectively. The project is expected to displace 108,000 tons of carbon dioxide equivalent ("tCO2e") in the first 6-year crediting period, generating an equivalent amount of certified emission reductions ("CERs").

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

"Central Graton" project is a small CDM project that will displace from the national grid, some thermal power plants that use diesel, residual (bunker), carbon or natural gas as fuel, reducing in this way CO2 emissions.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric plants with natural gas in combined cycle plants replacing most of the other plants with other plants with oils, of all types.

The project will assist the National Grid to keep thermal plants shut and use them only as stand-by power generation, therefore, displacing expensive heavy fuel, diesel, coal and gas fired generation and at the same time; reducing CO2 emissions to the atmosphere by generating energy without GHG emissions;

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the most recent version of Appendix B to the simplified M&P for smallscale CDM project activities ("Appendix B"), the type and category of the project activity for The Project is: Type I: Renewable Energy Project . Category D: Renewable electricity generation for a grid. The World Bank Carbon Finance Business applied this methodology to Peru and got a baseline emission factor of 577 tCO2/GWh.

Therefore, the project of Central Graton will displace approximately 19,977 tCO2 each/year, which otherwise will be emitted by thermal power plants of the national grid.

Current Status

Earliest project start date

January 2007

Estimate of time required before becoming operational

12 months. It is expected that the project will begin operation January 2007.

What is the project lifetime?

40 years

Current status or phase of the project eg: which of the following phases have been completed:

Central Graton HP has the following authorisations and status

- Authorisation for the use of the water resources
- Environmental study approved
- Definitive Concession granted by Resolución Suprema
- Contract with the Peruvian Estate for Definitive Concession for indefinite time
- Feasibility Study completed
- Financing negotiations: Closed
- The letter of approval was issued in January 2005 by the Designated National Authority on CDM.
- The project is under the validation process with a designated Operational Entity.
- It is expected to sign an ERPA during 2006.

Estimated Emission Reductions

Annual: an average of 19,977 tCO2e

- Up to and including 2012: 108,000 tCO2e
- Up to a period of 10 years: 180,000 tCO2e
- Up to a period of 7 years: 126,000 tCO2e
- Up to a period of 14 years: 252,000 tCO2e

Project Benefits

- Employing local labour in construction and plant management.
- Purifying/cleaning of the water for irrigation.
- Serving as a small demonstration project for clean renewable electricity generation in the country, functioning as an independent power producer ("IPP").
- Helping the country improve the hydrocarbons trade balance through reduction of oil imports to be used for electricity generation.
- The project's sponsor ("the sponsor") agreed to perform a broad social development monitoring plan, which comprises socio-economic and environmental targets.

Project Participant and Financing

Total project cost estimate in US\$: 5,751,000

- Equipment supplies: US\$ 2,588,000
- Civil Works: US\$ 2,166,000
- Installations and commissioning: US\$ 497,000
- Development: US\$ 500,000

Sources of finance to be sought or already identified:

- Equity US\$ 2.75 million
- Debt: US\$ 3.00 million
- Carbon finance contribution sought: none

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«Santa Rita» Hydropower Project

Santa Rita Hydropower Plant (Santa Rita HP, Santa Rita, The Project) is located in the central Andean region of Peru, 484 km to the north-east of the Lima and then about 75 Km East, at an altitude of 750 m. It benefits as a result of the excellent hydrology (over 40 year readings) of the Santa River River and a head of 220 meters. The Project is located about 70 KM downstream of Cañon del Pato HP (250 MW). Santa Rita's projected installed capacity is 173 to 220 MW. The Project's load factor is 68 to 72% with an average generation of 1,100,000 to 1,269,000 MWh per year estimated for the first 20 years of generation. At an estimated US\$33.0 per MWh, Santa Rita has a gross income of US\$35.5 million to 40.0 million. The Project is expected to displace 598,400 tCO₂ to 700,000 per year which accounts for 2,393,600 to 2,800,000 tCO₂ to for the first crediting period (4 years), generating the equivalent amount of Certified Emission Reductions (CERs).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

"Santa Rita" project will displace GHG emitted by thermal power plants of the national grid using diesel, residual (bunker), coal and natural gas.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric production with natural gas in combined cycle plants replacing most of the other plants with oil, of all types. National policies, sectoral policies and the new natural gas exploitation "Camisea" particular circumstance foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that "Santa Rita" project will displace around 598,400 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The construction of the project it is planned to begin on the second semester of 2005. The operation is assumed to start in March 2008.

Estimate of time required before becoming operational

30 months

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- Santa Rita HP has the following authorisations and status
- Authorisation for the use of the water resources
- Environmental study approved
- Definitive Concession granted by Resolución Suprema expected for April 2005.
- Contract with the Peruvian Estate for Definitive Concession for indefinite time
- Feasibility Study completed
- Financing negotiations: LOI from IFC, Eksportfinans and Nordic Investment Bank (NIB) have been received
- The letter of approval to be issued by the Designated National Authority on CDM is in process.
- The project is under the validation process with a designated Operational Entity.
- LOI from Hydro Quebec International for the O&M of the Project
- Preliminary EPC construction proposal scheduled for the 30th May, 2005 by GE Norway and Odebrecht of Brazil.

Estimated Emission Reductions

Annual: an average of 598,400 tCO₂e

- Up to and including 2012: 2,992,000 tCO₂e
- Up to a period of 10 years: 5,992,400 tCO₂e
- Up to a period of 7 years: 4,188,800 tCO₂e
- Up to a period of 14 years: 8,377,600 tCO₂e

Project Benefits

- The hydroelectric plant will use the water resources available from the Santa River, producing cheap energy with low environmental impact comparing with the electricity generated from thermal plants.
- Generation of Hidro-electricity would allow rural communities, improving their economic and production activities.
- The project would create new jobs, develop the surroundings and in general would contribute to the economic growth to a big portion of the country by supplying more energy thorough the interconnection of the project to the national grid.
- "Santa Rita" fulfils environment norms through the approval of its Environmental Impact Study by the Ministry of Energy and Mines. Local farmers approved the EIA in a Public Audience (16-11-04) sponsored by the Ministry of Energy and Mines of Peru.

Project Participant and Financing

Total project cost estimate in US\$: 183,000,000

- Civil Works: US\$ 93,000,000
- Machinery and equipment: US\$ 50,000,000
- Transmission lines: US\$ 7,000,000
- Other costs (contingency, interest during construction, etc.): US\$ 33,000,000
- Total project costs: US\$ 183,000,000

Sources of finance to be sought or already identified:

- Equity: 40% The project developer is looking for a US\$20.0 million financial investment
- Debt: 60% all under LOI
- Carbon finance contribution sought: equity loan from a development finance institutions requested using the ERPA as collateral

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«Poechos» Hydropower Project

This run of river project takes advantage of the works in the current Poechos reservoir, and it will be built downstream at the bottom gate of the dam. The plant shall be located close to the Poechos dam, taking advantage of a change of heights of about 40 m, between the level of the water in the reservoir and the level of water in the discharge on the Chira River.

Although the reservoir allows a multi-year regulation of the water, the control of the discharges are managed by the agricultural sector and are programmed according to the irrigation needs, reason why the project will not have facilities to regulate its energy production. The project has a installed capacity of 15.4 MW and an annual production of energy of 58.5 GWh.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«Poechos» project is almost a small scale CDM project and will displace GHG emitted by thermal power plants using diesel, residual (bunker), carbon and natural gas as fuel from the national grid.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric production with natural gas in combined cycle plants replacing most of the other plants with oil, of all types. National policies, sectoral policies and the new natural gas exploitation «Camisea» particular circumstance foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance Business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that «Poechos» project will displace around 31,878 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The construction of the project is done. The operation has already started on January 2004.

Estimate of time required before becoming operational

It is in operation

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- Energy and water concession have been already given.
- Financing negotiations are closed
- The construction is finished.
- The project has the host country letter of approval given by the Designated National Authority on CDM – CONAM.
- An Emission Reduction Purchase Agreement (ERPA) is signed with the World Bank Carbon Finance Business on December 2004.

Estimated Emission Reductions

Annual: an average of 31,878 tCO₂e

- Up to and including 2012: 255,024 tCO₂e
- Up to a period of 10 years: 318,780 tCO₂e
- Up to a period of 7 years: 223,146 tCO₂e
- Up to a period of 14 years: 446,292 tCO₂e

Project Benefits

- 200 jobs during the construction of the power plant and 30 steady jobs
- Communities along the transmission line were given the opportunity to connect to the line. The Project has lately installed a 22.9 KV keys yard to feed 3 small isolated systems: The Lancones system, The Chira system, and a third one that goes into a small population located close to the Ecuadorian border.
- The project will reduce operational costs of the reservoir of Poechos, displacing the current use of diesel power plants and benefiting local farmers.
- The project will support financing education and local technical training.

Project Participant and Financing

Total project cost estimate:

- Development cost: US\$ 1,000,000
- Installed cost: US\$ 15,000,000
- Other Cost: US\$ 500,000
- Total project costs: US\$ 16,500,000

Sources of finance to be sought or already identified:

- Equity: US\$ 1,700,000
- Debt : US\$ 8,500,000 Interamerican Investment Corporation(IIC) US\$ 6,000,000 DEG
- Carbon finance contribution sought: As much as we can have in advance.

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San Gaban I Hydroelectric Project

«San Gaban I» Project consists of a run of river hydroelectric power plant of 150 MW capacity and it will produce an average net annual generation of 932 GWh. «San Gaban I» hydro power will supply electric power to a mining operation and will be connected to the National Interconnected System (SEIN in Spanish) to supply energy not only for the southern region of Peru but also for all the areas connected to the SEIN. Construction is expected to start in 2005, and start operation in 2008. According to the Baseline Emission Factor got by the World Bank using the Consolidated Methodology ACM0002, the project will reduce annually 507,008 tCO₂e.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«San Gaban I» project is a CDM project and will displace GHG emitted by thermal power plants using diesel, residual (bunker), coal and natural gas as fuel from the national grid.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric plants with natural gas in combined cycle plants replacing most of the other plants with oil, of all types. The project will displace energy from thermal plants of the grid.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that «San Gaban I» project will displace around 507,008 tCO₂e/year which otherwise will be emitted by thermal power plants.

Current Status

Earliest project start date

The construction of the project is planned to begin in the third quarter of 2005. The operation is assumed to start in mid 2008.

Estimate of time required before becoming operational

3 years

What is the project lifetime?

30 years

Current status or phase of the project eg: which of the following phases have been completed:

- Feasibility study finished (available)
- The environmental and archaeological impact studies have been duly approved by the Ministry of Energy and Mines.
- The concession for the water use was given by General Administrative Procedure N° 211-DRAP-ATDRR/AT from the Ministry of Agriculture on October 29, 2003.
- A permanent and definite Energy Concession was approved under Supreme Resolution No. 004-2004-EM on February 03, 2004.
- Financing negotiations are not closed. PPA and EPC under negotiations.
- Engineering studies was made by Lahmeyer Engineering
- The letter of approval by the Designated National Authority on CDM is in process.

Estimated Emission Reductions

Annual: an average of 507,008 tCO₂e

- Up to and including 2012: 2,028,032 tCO₂e
- Up to a period of 10 years: 5,070,080 tCO₂e
- Up to a period of 7 years: 3,549,056 tCO₂e
- Up to a period of 14 years: 7,098,112 tCO₂e

Project Benefits

- The hydroelectric plant will use the water resources available from the San Gaban River, producing cheap energy with low environmental impact comparing with the electricity generated from thermal plants.
- Generation of Hydro-electricity would allow displacing or shutting down a carbon power thermal plant and also would allow rural communities, improving their economic and production activities.
- The project would create new jobs, develop the surroundings and in general would contribute to the economic growth to a big portion of the country by supplying more energy through the interconnection of the project to the national grid.
- «San Gaban I» fulfils the environment norms according to its Environmental Impact Study. This study was approved by the Ministry of Energy and Mines on February 13, 2003 under Directorial Resolution No. 084-2003-EM-DGAA.

Project Participant and Financing

Total project cost estimate:

- Civil Works: US\$ 68,405,000
- Machinery and equipment: US\$ 30,920,000
- Transmission lines: US\$ 34,975,000
- Other costs: US\$ 4,000,000
- Total project costs: US\$ 138,300,000

Sources of finance to be sought or already identified:

- Equity: 30 TO 35 %. Additional equity participation is in negotiations with an interested European investor.
- Debt: 70 TO 65 %
- Carbon finance contribution sought: As much as we can have in advance.

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Santa Rosa Hydroelectric Power Plant

The Project is a bundle of 3 small run-of-river hydroelectric power plants, with 2 km of distance one another, located in Lima-Peru, in the Santa Rosa Irrigation in the Sayan District. The Purpose of The Project is renewable electricity generation for the National Electric Grid (SEIN). The Project installed capacity and projected yearly average generation is 4.1 MW and 30.2 GWh per year, respectively.

The Project is expected to displace 98,436 tCO₂e for the first crediting period (7 years), generating the equivalent amount of Certified Emission Reductions (CERs). The project has signed an ERPA with the World Bank Carbon Finance Business.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«Santa Rosa» project is a small CDM project that will displace from the national grid, some thermal power plants that use diesel, residual (bunker), carbon or natural gas as fuel, reducing in this way CO₂ emission.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric plants with natural gas in combined cycle plants replacing most of the other plants with other plants with oils, of all types.

The project will assist the National Grid to keep thermal plants shut and use them only as stand-by power generation, therefore, displacing expensive heavy fuel, diesel, coal and gas fired generation and at the same time; reducing CO₂ emissions to the atmosphere by generating energy without GHG emissions.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the most recent version of Appendix B to the simplified M&P for small-scale CDM project activities («Appendix B»), the type and category of the project activity for The Project is: Type I: Renewable Energy Project . Category D: Renewable electricity generation for a grid. The World Bank Carbon Finance Business applied this methodology to Peru and got a baseline emission factor of 577 tCO₂/GWh.

Therefore, the project of Santa Rosa will displace approximately 17,956 tCO₂e each/year, which otherwise will be emitted by thermal power plants of the national grid.

Current Status

Earliest project start date

The component Santa Rosa II of The Project was commissioned in August 2004; Santa Rosa I will be commissioned in December 2005 and Santa Rosa III in December 2006. Therefore The Project starting date is August 2004.

Estimate of time required before becoming operational

Currently is in operation.

What is the project lifetime?

More than 40 Years

Current status or phase of the project eg: which of the following phases have been completed:

- Santa Rosa II is built, Santa Rosa I is under construction, Santa Rosa III will begin construction in January 2006.
- Has an ERPA and all National Authorizations including the letter of approval of the national designated authority on CDM
- The project has a PPA for five years and the finances are closed.

Estimated Emission Reductions

Annual: Since 2009 an average of 17,378 tCO₂e

- Up to and including 2012: 115,814 tCO₂e
- Up to a period of 10 years: 150,570 tCO₂e
- Up to a period of 7 years: 98,436 tCO₂e
- Up to a period of 14 years: 220,082 tCO₂e

Project Benefits

- purification and cleaning of the water for irrigation;
- better electricity supply in the irrigation to be used for water pumping,
- increase possibilities for rural electrification around The Project Sites;
- serve as a small demonstrative project for clean renewable energy generation in the country functioning as an IPP,
- The Project Sponsor will give US\$1 per tCO₂e to social service in the rural area of the Santa Rosa Irrigation to be used either to support the local school in Santa Rosa or the local orphan asylum.

Project Participant and Financing

Total project cost estimate:

- Total Investment: US\$ 3,660,000

Sources of finance to be sought or already identified:

- Financial agreements are closed. US\$ 1,730,000 has been provided by the sponsor of the project Electrica Santa Rosa SAC. US\$ 1,930,000 was debt and was provided by a local bank.
- Carbon finance contribution sought: An ERPA with the World Bank Carbon Finance Business has been signed. CERs revenues will be effective upon delivery.

Contact Information:

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«Rehabilitation of Calca» Hydropower Project

«Compañía Eléctrica Calca S.A.C» proposes to rehabilitate the old Hydropower Plant of Calca, by using the same facilities of the old plant, performing some upgrades and acquiring the necessary equipment for working and operating. The project will have an installed capacity of 3.00 MW, with two turbine-generator groups, and an annual electric energy production of 19.85 GW-h. In the rehabilitation of this hydropower there are two aspects to consider: First, the Civil works include the design and construction of two intakes, a forebay, replace actual penstock, anchors and supporting bases, new foundation for the equipment in the powerhouse, maintenance of channels. Second, the complete electromechanical equipment, and a transmission line to connect to the national grid. The plant shall be located close to city of Calca, 3.6 km. in the region of Cusco.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«Calca» project is a small CDM project that will displace from the national grid, some thermal power plants that use diesel, residual (bunker), carbon or natural gas as fuel, reducing in this way GHG emissions.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric plants with natural gas in combined cycle plants replacing most of the other plants with other plants with oils, of all types.

It is an opportunity to increase the clean electric power generation and to reduce or substitute the oil/gas fired thermal power stations in an already increasing power deficit system.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the most recent version of Appendix B to the simplified M&P for small-scale CDM project activities («Appendix B»), the type and category of the project activity for The Project is: Type I: Renewable Energy Project. Category D: Renewable electricity generation for a grid. The World Bank Carbon Finance Business applied this methodology to Peru and got a baseline emission factor of 577 tCO₂/GWh.

Therefore, the rehabilitation of «Calca» will displace approximately 11,811 tCO₂e each/year, which otherwise will be emitted by thermal power plants of the national grid.

Current Status

Earliest project start date

«Calca project» has almost all its civil works constructed and in good condition, but it needs all the electromechanical equipment, so in one year, with the financial support, it could start generating electricity.

Estimate of time required before becoming operational

One year, after the finance is granted.

What is the project lifetime?

More than 50 Years

Current status or phase of the project:

- Water use authorization is already given.
- We are in search of financial support or partner
- A Letter of Intention has already signed to purchase the energy, by the local area power distributor

Estimated Emission Reductions

Annual: an average of 11,453 tCO₂e

- Up to and including 2012: 68,721 tCO₂e
- Up to a period of 10 years: 114,534 tCO₂e
- Up to a period of 7 years: 80,174 tCO₂e
- Up to a period of 14 years: 160,348 tCO₂e

Project Benefits

- There will be no environmental impact, since the rehabilitation will be done on existing structures.
- The improvement of irrigation techniques on the border communities.
- In the future, regulation of the lagoons to increase the amount of water to be used for the agriculture as well.
- Contribution to the ONG's, to improve the level of life for the Community.

Project Participant and Financing

Total project cost estimate:

- Investment Budget: US\$ 2,630,000
- Annual Expenditures: US\$ 105,000
- Annual Incomes (including carbon credits): US\$ 521,000

Sources of finance to be sought or already identified:

- We are seeking a source of finance or/and partner
- Carbon finance contribution sought: As much as we can have in advance.

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Callahuanca Hydroelectric Refurbishment Project

Electricity generated by Callahuanca Plant is dispatched to the Peruvian electricity grid. Currently the plant has a total installed capacity of 75MW. Additional capacity will be achieved by changing three of the four installed generating groups (turbines, generators and electric transformers) in order to take more advantage of Santa Eulalia and Rimac Rivers' capacity. This refurbishment will increase the plant's capacity up to 82,5 MW without additional environmental impacts, as neither dam enlargements nor new water inlets are necessary.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

Additional energy generated by Callahuanca Plant will displace energy which would otherwise be generated by other generation plants. The amount of thermal energy displacement will be calculated using an indicative simplified methodology for small scale projects (AMS-I.D) based on combined margins, calculating displacement of both operating thermal plants (operating margin, short term) and future generating plants (build margin, long term).

What would the future look like without the proposed CDM project?

Without the carbon finance the proposed project activity will not be approved by EDEGEL. Then, additional capacity would have been offered by a determined mix of thermal and hydro generation plants (according to the combined margins model).

What would the estimated total greenhouse gas (GHG) reduction be with the project?

We have estimated an annual reduction of around 28,235 tCO₂e.

Current Status

Earliest project start date

January 2006

Estimate of time required before becoming operational

9 months

What is the project lifetime?

20 years

Current status or phase of the project eg: which of the following phases have been completed:

The project has the following authorisations and status

- Feasibility Study completed
- Financing negotiations are closed
- The letter of approval was issued in January 2005 by the Designated National Authority on CDM.
- National standards on air quality
- Law on sustainable exploitation of natural resources
- Environmental and natural resources code
- GHG mitigation options in Peru, according to Peruvian National Communication to UNFCCC)
- Environmental Impact Assessment is not required by local environmental authorities.
- CERs will be sold to ENDESA, mayor share holder of EDEGEL, the owner company of the project.

Estimated Emission Reductions

Annual: an average of 28,235 tCO₂e

- Up to and including 2012: 216,465 tCO₂e
- Up to a period of 10 years: 272,934 tCO₂e
- Up to a period of 7 years: 216,465 tCO₂e
- Up to a period of 14 years: 348,226 tCO₂e

Project Benefits

- Part of Callahuanca's earnings will derive to reforestation of vulnerable-to-erosion mountain areas with autochthonous species which will allow sustainable exploitation by local communities.
- Increasing availability and reliability of energy supply: contribution to industrial and commercial development.
- Creation of new jobs
- Specific training for plant's remote control operators.
- Increase of taxes paid to Government.

Project Participant and Financing

Total project cost estimate:

- Development cost: US\$ 13,800,000
- Installed Cost: ---
- Other cost: ---
- Total project costs: US\$ 13,800,000

Sources of finance to be sought or already identified:

- Equity: Financing is closed
- Debt : ---
- Carbon finance contribution sought: CERs will be sold to ENDESA.

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San Carlos Hydroelectric Power Plant

The Project is a small run-of-river hydroelectric power plant, located downstream of current Carhuaquero hydro power plant in Cajamarca- Perú and using its water discharged that corresponds to the Chancay river basin. The Purpose of The Project is renewable electricity generation for the National Electric Grid (SEIN). The Project installed capacity and projected yearly average generation is 5.0 MW and 37 GWh per year, respectively.

The Project is expected to displace approximately 149,443 tCO₂e for the first crediting period (7 years), generating the equivalent amount of Certified Emission Reductions (CERs).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«San Carlos Hydro Plant» project is a small CDM project that will displace from the national grid, some thermal power plants that use diesel, residual (bunker C), coal or natural gas as fuel, reducing in these way CO₂ emissions.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric plants (Gas Turbines) with natural gas in Single and Combined Cycle plants replacing most of the other plants with other plants with oils, of all types.

The project will assist the National Grid to keep thermal plants shut and use them only as stand-by power generation, therefore, displacing expensive heavy fuel oil, diesel, coal and gas fired generation and at the same time; reducing CO₂ emissions to the atmosphere by generating energy without GHG emissions;

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the most recent version of Appendix B to the simplified M&P for small-scale CDM project activities («Appendix B»), the type and category of the project activity for The Project is: Type I: Renewable Energy Project . Category D: Renewable electricity generation for a grid. The World Bank Carbon Finance Business applied this methodology to Peru and got a baseline emission factor of 577 tCO₂/GWh.

Therefore, the project of San Carlos will displace approximately 21,349 tCO₂e each/year, which otherwise will be emitted by thermal power plants of the national grid.

Current Status

Earliest project start date

The Basic engineering and bid documents preparation is in process. The bidding for EPC execution has been foreseen for July 2005 and it is expected to be awarded by August 2005. The construction is scheduled for 12 months.

Therefore The Project starting date is expected to be September 2006.

Estimate of time required before becoming operational

Since may, Fifteen (15) months.

What is the project lifetime?

More than 40 Years

Current status or phase of the project:

- Water permit have been already given
- Authorization by M.E.M. in process.
- Financing (own resources) and internal approval by our corporation in process.
- Bidding documents for construction in progress.

Estimated Emission Reductions

Annual: Since 2006 an average of 21,349 tCO₂e

- Up to and including 2012: 134,498.7 tCO₂e
- Up to a period of 10 years: 213,490 tCO₂e
- Up to a period of 7 years: 149,443 tCO₂e
- Up to a period of 14 years: 298,880 tCO₂e

Project Benefits

- Project will support and improve a part of the regional electric supply because of the addition a new generation to give more reliability and quality to the current 22.9 kV electric system.
- The project will contribute with the sustainable development of a rural area which is far from the main populated cities.
- The Project fulfills the environmental standards of Perú and local people support it development.
- Increase possibilities for rural electrification around The Project Site.
- During construction adds new local jobs and more economic activity of the area (surrounding towns such as La Ramada, San Carlos, Chongoyape, etc.)
- Serve as a small demonstrative project for clean renewable energy generation in the country.

Project Participant and Financing

Total project cost estimate:

- Development cost: US\$ 300,000
- EPC Cost: US\$ 5,200,000
- Engineering and Management: US\$ 200,000
- Other costs: US\$ 300,000
- Total Investment: US\$ 6,000,000

Sources of finance to be sought or already identified:

- Financial mainly will be provided by the internal resources of Duke Co.
- Carbon finance contribution sought: We are looking for the best deal.

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San Diego Hydroelectric Power Plant

The Project is a small run-of-river hydroelectric power plant, located close to the current San Diego Daily Reservoir, in Province of Huaylas - Ancash - Peru, using the Santa river resources. The purpose of The Project is renewable electricity generation for the National Electric Grid (SEIN). The Project installed capacity and projected yearly average generation is 3.8MW and 21GWh per year, respectively.

The Project is expected to displace approximately 84,819 tCO₂e for the first crediting period (7 years), generating the equivalent amount of Certified Emission Reductions (CERs).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«San Diego Hydro Plant» project is a small CDM project that will displace from the national grid, some thermal power plants that use diesel, residual (bunker C), coal or natural gas as fuel, reducing in this way CO₂ emissions.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermolectric plants (Gas Turbines) with natural gas in Single and Combined Cycle plants replacing most of the other plants with other plants with oils, of all types.

The project will assist the National Grid to keep thermal plants shut and use them only as stand-by power generation, therefore, displacing expensive heavy fuel oil, diesel, coal and gas fired generation and at the same time; reducing CO₂ emissions to the atmosphere by generating energy without GHG emissions;

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the most recent version of Appendix B to the simplified M&P for small-scale CDM project activities («Appendix B»), the type and category of the project activity for The Project is: Type I: Renewable Energy Project. Category D: Renewable electricity generation for a grid. The World Bank Carbon Finance Business applied this methodology to Peru and got a baseline emission factor of 577 tCO₂/GWh.

Therefore, the project of San Diego will displace approximately 12,117 tCO₂e each/year, which otherwise will be emitted by thermal power plants of the national grid.

Current Status

Earliest project start date

The Basic engineering is completed. The bidding process for EPC execution has just begun on March 2005 and it is expected to be awarded by June 2005. The construction is scheduled for 12 months. Therefore The Project starting date is expected to be in June 2006.

Estimate of time required before becoming operational

Since may, thirteen (13) months.

What is the project lifetime?

More than 40 Years

Current status or phase of the project:

- Water permit have been already given
- Authorization by M.E.M. in process.
- Financing (own resources) and internal approval by our corporation in process.
- Bidding process for construction in process.

Estimated Emission Reductions

Annual: Since 2006 an average of 12,117 tCO₂e

- Up to and including 2012: 78,760.5 tCO₂e
- Up to a period of 10 years: 121,170 tCO₂e
- Up to a period of 7 years: 84,819 tCO₂e
- Up to a period of 14 years: 169,638 tCO₂e

Project Benefits

- Project will support and improve the Callejon de Huaylas electric supply because of the addition a new generation to give more reliability to the local electric system;
- The project will contribute with the sustainable development of a rural area which is far from the main populated cities;
- The Project fulfills the environmental standards of Peru and local people support it development;
- Increase possibilities for rural electrification around The Project Site;
- Serve as a small demonstrative project for clean renewable energy generation in the country.

Project Participant and Financing

Total project cost estimate:

- Development cost: US\$ 300,000
- EPC Cost: US\$ 2,500,000
- Engineering and Management: US\$ 200,000
- Other costs: US\$ 300,000
- Total Investment: US\$ 3,300,000

Sources of finance to be sought or already identified:

- Financial mainly will be provided by the internal resources of Duke Co.
- Carbon finance contribution sought: As much as the project can have in advance.

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«Yaupi» Hydropower Expansion Project

ElectroAndes is an electric generation company that operates four hydroelectric generating facilities in the central Andean region of Peru. Its largest facility at Yaupi is a 108 MW plant with sufficient hydrology to maintain a plant factor close to 85%, significantly above the national average. The project described herein aims to increase the plant's generating capacity by approximately 35 MW, taking advantage of the water flows from the Huachón and Paucartambo rivers, as well as the additional flows (5 m³/sec) to be contributed by the Yuncán facility (owned by a third party) due to come on line in July of 2005. Production at Yaupi is set to increase by 189 GWh per year, with a plant factor close to 73%. The Project is expected to displace 102,816 tCO₂e per year, which accounts for 719,712 tCO₂e for the first crediting period (7 years), generating the equivalent amount of Certified Emission Reductions (CERs).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

The «Yaupi» expansion project will displace GHG emitted by thermal power plants of the national grid using diesel, residual (bunker), coal and natural gas.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric production with natural gas in simple and combined cycle plants replacing most of the other plants with oil, of all types. National policies, sectoral policies and the new natural gas exploitation «Camisea» particular circumstance foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that «Yaupi» project will displace around 102,816 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The construction of the project it is planned to begin on the second semester of 2005. The operation is assumed to start in 4th quarter 2007.

Estimate of time required before becoming operational

Two years

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- Authorization for the use of the water resources.
- Environmental studies will not be required due to the fact that this expansion is for less than 50% of existing capacity.
- Definitive Concession granted by Resolución Suprema N° 042-2003-EM of December 3, 2003.
- Concession agreement in place with the Peruvian government for an indefinite time.
- Technical feasibility study completed.

Estimated Emission Reductions

Annual: an average of 102,816 tCO₂e

- Up to and including 2012: 514,080 tCO₂e
- Up to a period of 10 years: 1,028,160 tCO₂e
- Up to a period of 7 years: 719,712 tCO₂e
- Up to a period of 14 years: 4,536,470 tCO₂e

Project Benefits

- The expansion of the «Yaupi» hydroelectric plant will use the water resources available from the Huachón and Paucartambo Rivers, producing cheap energy with low environmental impact compared to the electricity generated from thermal plants.
- The project would create new jobs during construction, and would contribute to the economic growth of the country by supplying cheaper energy to the national grid.
- The expansion of «Yaupi» fulfils the environment requirements as per the Ministry of Energy and Mines.

Project Participant and Financing

Total project cost estimate:

- Electromechanical equipment: to be determined
- Transport, assembly, etc.: to be determined
- Additional penstock: to be determined
- Total project costs: to be determined

Sources of finance to be sought or already identified:

- Equity: 0%
- Debt: 100%
- Carbon finance contribution sought: Enough to offset the incremental debt burden that the project will impose on the company.

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«PARIAC CH 5» Hydropower Project

This run of the river project will be built upstream of the existing PARIAC mini hydro facilities using the same hydro resources and the same power substation, which will not require any expansion of the power transformer. The project does not need facilities to regulate its energy production. The project has an installed capacity of 5 MW and an estimated energy annual production of 34.8 GWh.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«PARIAC CH 5» Project is a small scale CDM project and will displace GHG emitted by thermal power plants using diesel, residual (bunker), carbon and natural gas as fuel from the national grid.

What would the future look like without the proposed CDM project?

We foresee that the new capacity added to the grid in the future will be basically thermal power plants burning natural gas in combined cycle plants, which will replace most of the other plants operating with oil, coal and other fossil fuels. National policies, energy sector policies and the new natural gas exploitation of «Camisea» lead to particular circumstances that tend to foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the most recent version of Appendix B to the simplified M&P for small-scale CDM project activities («Appendix B»), the type and category of the project activity for The Project is: Type I: Renewable Energy Project. Category D: Renewable electricity generation for a grid. The World Bank Carbon Finance Business applied this methodology to Peru and got a baseline emission factor of 577 tCO₂/GWh.

Therefore, the project of «PARIAC CH 5» will displace approximately 20,080 tCO₂e each/year, which otherwise will be emitted by thermal power plants of the national grid.

Current Status

Earliest project start date

The preliminary design using the left river edge was completed in February 2005; the bidding for the final feasibility study will finalize on April 22nd 2005. The final feasibility study will compare both river edges and is planned to be finish in July 2005.

Estimate of time required before becoming operational

We plan to complete the project on December 2006.

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- Energy and water concession have been already given.
- Cahua's board approved the «go ahead» of the final feasibility study in order to be ready to make an investment decision on August 2005.

Estimated Emission Reductions

Annual: an average of 20,080 tCO₂e

- Up to and including 2012: 120,478 tCO₂e
- Up to a period of 7 years: 140,557 tCO₂e
- Up to a period of 10 years: 200,796 tCO₂e
- Up to a period of 14 years: 281,114 tCO₂e

Project Benefits

- 200 indirect jobs during construction works.
- Displaces around 20,080 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas
- Creates the opportunity to easily interconnect the villages located in the surroundings of the project area of influence.
- Increases the participation of the hydro-power generation in the Peruvian electricity total demand.

Project Participant and Financing

Total project cost estimate:

- Development cost (own resources): US\$ 420,400
- Equipment cost: US\$ 2,537,800
- Civil works: US\$ 2,914,000
- Total project costs: US\$ 5,872,200

Sources of finance to be sought or already identified:

- Equity: US\$ 2,936,100 (to be determined upon completion of feasibility analysis)
- Debt (through the Bonus emission program): US\$ 2,936,100 (to be determined upon completion of feasibility analysis)
- Carbon finance contribution sought: As much as we can have in advance.

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«PARIAC CH 2-3» Hydropower Optimization Project

This run of the river project will optimize the operation of four small hydro power plants, concentrating the facilities in only two hydro power plants, reducing the environmental impacts (due to the closing two powerhouses) and increasing the effective power output in 0.7 MW. The existing facilities currently do not use the full installed capacity of the equipment as per designed and also do not take properly advantage of the geographic leap. The project maintains the hydro power resource utilization and does not need facilities to regulate its energy production. The project will increase the installed capacity in 0.7 MW and the annual production of energy in 5 GWh.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«PARIAC CH 2-3» Project is a small scale CDM project and will displace GHG emitted by thermal power plants using diesel, residual (bunker), carbon and natural gas as fuel from the national grid.

What would the future look like without the proposed CDM project?

We foresee that the new capacity added to the grid in the future will be basically thermal power plants burning natural gas in combined cycle plants, which will replace most of the other plants operating with oil, coal and other fossil fuels. National policies, energy sector policies and the new natural gas exploitation of «Camisea» lead to particular circumstances that tend to foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the most recent version of Appendix B to the simplified M&P for small-scale CDM project activities («Appendix B»), the type and category of the project activity for The Project is: Type I: Renewable Energy Project. Category D: Renewable electricity generation for a grid. The World Bank Carbon Finance Business applied this methodology to Peru and got a baseline emission factor of 577 tCO₂/GWh.

Therefore, the project of «PARIAC CH 2-3» will displace approximately 2,885 tCO₂e each/year, which otherwise will be emitted by thermal power plants of the national grid.

Current Status

Earliest project start date

The feasibility studies were completed in January 2005 and presently a Consulting Company is preparing the EPC's documents for the bidding process that we expect to complete in July, 2005.

Estimate of time required before becoming operational

We plan to complete the construction of the optimization project before July 2006.

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- Energy and water concession have been already given.
- Cahua's board approved the «go ahead» with the EPC's process.

Estimated Emission Reductions

Annual: an average of 2,885 tCO₂e

- Up to and including 2012: 18,512 tCO₂e
- Up to a period of 7 years: 21,397 tCO₂e
- Up to a period of 10 years: 30,052 tCO₂e
- Up to a period of 14 years: 40,390 tCO₂e

Project Benefits

- 50 indirect jobs during construction works.
- Displaces around 2,885 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.
- Optimizes the operation of the four small hydro power plants scheme, concentrating the facilities in only two hydro power plants facilities.
- Reduces the environmental impacts (due to the closing two powerhouses).
- Increases and optimizes the use of the equipments' design capacities and also take properly advantage of the geographic leap.
- Reduces the operation & maintenance costs.

Project Participant and Financing

Total project cost estimate:

- Development cost: US\$ 25,000
- Installed cost: US\$ 804,000
- Other Cost: US\$ 180,000
- Total project costs: US\$ 1,009,000

Sources of finance to be sought or already identified:

- Equity: US\$ 1,009,000 (own resources)
- Debt: Not required
- Carbon finance contribution sought: As much as we can have in advance.

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«CURQUISH» Hydropower Project

This run of the river project will be built upstream of the existing CAHUA hydro plant, using hydro resources from the Huayllapa & Pumarinri rivers (part of Pativilca River Basin), the intakes will be located at 3,600 & 3,610 m.a.s.l. respectively, with 9 km of conduction tunnels, and the power house will be built in a cavern with two Pelton units with a total height of 705 meters. The project does not need facilities to regulate its energy production. The project plans to have an installed capacity of 88 MW and an estimated annual energy production of 439 GWh.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«CURQUISH» Project is a medium scale CDM project and will displace GHG emitted by thermal power plants using diesel, residual (bunker), carbon and natural gas as fuel from the national grid.

What would the future look like without the proposed CDM project?

We foresee that the new capacity added to the grid in the future will be basically thermal power plants burning natural gas in combined cycle plants, which will replace most of the other plants operating with oil, coal and other fossil fuels. National policies, energy sector policies and the new natural gas exploitation of «Camisea» lead to particular circumstances that tend to foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance Business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that «CURQUISH» project will displace around 238,816 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The preliminary design was complete on December 2004; the geologic study including field test & investigation will finish in August 2005, then the final design & feasibility analysis will be finished in December 2005.

Estimate of time required before becoming operational

We plan to complete the project in June 2010.

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- Energy and water concession for studies have been already given.
- Cahua's board approved go ahead with the final design & feasibility studies.

Estimated Emission Reductions

Annual: an average of 238,816 tCO₂e

- Up to and including 2012: 358,224 tCO₂e
- Up to a period of 7 years: 1,671,712 tCO₂e
- Up to a period of 10 years: 2,388,160 tCO₂e
- Up to a period of 14 years: 3,343,424 tCO₂e

Project Benefits

- 2,000 indirect jobs during construction works.
- The project would create new jobs, promote sustainable development of the surroundings of the project (local communities) and in general shall contribute to the economic growth to a big portion of the country by supplying more clean and cheap energy through the interconnection of the project to the national grid.
- Displace around 238,816 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas
- Increase the participation of the hydro-power generation in the Peruvian electricity demand.

Project Participant and Financing

Total project cost estimate:

- Development cost: US\$ 4,370,000
- Equipment cost: US\$ 28,470,000
- Civil works: US\$ 40,838,000
- Total project costs: US\$ 73,678,000

Sources of finance to be sought or already identified:

- Equity: US\$ 15,000,000 (shareholders and other investors, to be determined before completion of feasibility analysis)
- Debt: US\$ 58,678,000 through project finance/capital markets (local or foreign, to be determined before completion of feasibility analysis)
- Carbon finance contribution sought: As much as we can have in advance.

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«PUQUIAN» Hydropower Project

This run of the river project will be built upstream of the existing CAHUA hydro power plant and downstream of the Curquish Project, the configuration is in cascade, then Puquian Plant will receive water discharged from the Curquish Plant (water resource from Huayllapa & Pumarinri rivers), with 4.8 km of conduction tunnels and a power house that will be built in a cavern with two Pelton units with a total height of 790 meters. The project does not need facilities to regulate its energy production. The project plans to have an installed capacity of 106 MW and an estimated annual energy production of 531 GWh.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

«PUQUIAN» Project is a medium scale CDM project and will displace GHG emitted by thermal power plants using diesel, residual (bunker), carbon and natural gas as fuel from the national grid.

What would the future look like without the proposed CDM project?

We foresee that the new capacity added to the grid in the future will be basically thermal power plants burning natural gas in combined cycle plants, which will replace most of the other plants operating with oil, coal and other fossil fuels. National policies, energy sector policies and the new natural gas exploitation of «Camisea» lead to particular circumstances that tend to foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance Business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that «PUQUIAN» project will displace around 288,864 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The preliminary design was complete in December; the geologic study including field test & investigation will finish in August 2005, then the final design & feasibility will be finished in December 2005.

Estimate of time required before becoming operational

We plan to complete the project in June 2010.

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- Energy and water concession for studies have been already given.
- Cahua's board approved go ahead with the final design & feasible study.

Estimated Emission Reductions

Annual: an average of 288,864 tCO₂e

- Up to and including 2012: 433,296 tCO₂e
- Up to a period of 7 years: 2,022,048 tCO₂e
- Up to a period of 10 years: 2,888,640 tCO₂e
- Up to a period of 14 years: 4,044,096 tCO₂e

Project Benefits

- 2000 indirect jobs during construction works.
- The project will create new jobs, will promote sustainable development of the surroundings of the project (local communities) and in general shall contribute to the economic growth to a big portion of the country by supplying more clean and cheap energy through the interconnection of the project to the national grid.
- Displace around 288,864 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas
- Increase the participation of the hydro-power generation in the Peruvian electricity demand.

Project Participant and Financing

Total project cost estimate:

- Development cost: US\$ 5,119,000
- Equipment cost: US\$ 42,300,000
- Civil works: US\$ 39,500,000
- Total project costs: US\$ 86,895,000

Sources of finance to be sought or already identified:

- Equity: US\$ 18,000,000 (shareholders and other investors, to be determined before completion of feasibility analysis)
- Debt : US\$ 68,895,000 through project finance/capital markets (local or foreign, to be determined before completion of feasibility analysis)
- Carbon finance contribution sought: As much as we can have in advance.

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La Joya Hydroelectric Power Plant

La Joya project plant is a small run-of-the-river hydropower plant, located in the Department of Arequipa, Province of Arequipa, in La Joya District. This Project will use the water source of La Joya channel, from Chili River Technical Management Irrigation District; the purpose is to use the water in energy generation. This hydropower plant will set up at the end of the channel, and would have an install capacity of 9.6 Mw and an annual generation of 69.81 Gwh/year. The energy will be delivering to National Electric Grid System (SEIN).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

"C.H. La Joya" hydroelectric project is a small CDM project that will displace from the national grid, some thermal power plants that use diesel, residual (bunker), carbon or natural gas as fuel, reducing in this way CO2 emission.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric plants with natural gas in combined cycle plants replacing most of the other plants with other plants with oils, of all types.

The project will assist the National Grid to keep thermal plants shut and use them only as stand-by power generation, therefore, displacing expensive heavy fuel, diesel, coal and gas fired generation and at the same time; reducing CO2 emissions to the atmosphere by generating energy without GHG emissions.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the most recent version of Appendix B to the simplified M&P for small-scale CDM project activities ("Appendix B"), the type and category of the project activity for The Project is: Type I: Renewable Energy Project . Category D: Renewable electricity generation for a grid. The World Bank Carbon Finance Business applied this methodology to Peru and got a baseline emission factor of 577 tCO2/GWh.

Therefore, the project of C.H. La Joya will displace approximately 40,274 tn CO2 each/year, which otherwise will be emitted by thermal power plants of the national grid.

Current Status

Earliest project start date

June 2007

Estimate of time required before becoming operational

- Time required for financial commitments: 01 months
- Time required for legal matters: 00 months
- Time required for negotiations: 01 months
- Time required for construction: 14 months

What is the project lifetime?

30 years

Current status or phase of the project:

- Feasibility Studies are available
- Concession for water use is given
- Energy concession is available
- The Letter of approval is pending
- Financials are not close

Estimated Emission Reductions

Annual: Since 2007 an average of 40,274 tCO2e

- Up to and including 2012: 201,370 tCO2e
- Up to a period of 10 years: 402,740 tCO2e
- Up to a period of 7 years: 281,918 tCO2e
- Up to a period of 14 years: 563836 tCO2e

Project Benefits

- The project would create new jobs during construction and operation of the hydropower plant
- Purification and cleaning of water for irrigation.
- Improve the water quality for irrigation, installing a sand and particle removal from water, this can change gravity irrigation practice to drop /pressurize irrigation system and in this way improve the efficient use of water resource and production.
- Enlarge agrarian land frontier in 3000 Ha.
- Availability of low cost electricity will assist local households to improve their quality of life. These projects shall be connected to the grid.
- Part of the revenues of the Project would be use in reforestation of near areas to La Joya town, with endemic species, for a sustainable use of the resource.

Project Participant and Financing

Total project cost estimate:

- Development Cost: US\$ 250,000
- Installed Cost: US\$ 11,000,000
- Other cost: US\$ 200,000
- Total Project Cost: US\$ 11,350,000

Sources of finance to be sought or already identified:

- The project developer has US\$ 2,000,000 for the equity. The project needs around US\$2000, 000 of additional equity to leverage the rest as a loan.
- Carbon finance contribution sought: As much as the project can have in advance.

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Rehabilitation of the hydroelectric of Machupicchu

The project "Rehabilitation of the hydroelectric of Machupicchu" is located left shore of the river Vilcanota, some hundreds of meters far from the intersection of the river with the canyon of Aobamba, and few kilometers from the Machupicchu ruins. This run of river project takes the advantage of the natural flows of the Vilcanota River and the existed reservoir of Sibilacocha. The project aims to rehabilitate the Hydroelectric of Machupicchu that was destroyed in 1998 by a flood produced by a mudslide. The project comprises two phases: the first phase, which entered in operation in mid 2001, is a 90 MW hydro with 719 GWh of annually energy production. The second phase is a 75 MW with 518 GWh of annually energy production that will enter in operation in 2008. The project's owner is Empresa de Generación Eléctrica Machupicchu S.A. – EGEMSA.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

"Machupicchu" project will displace GHG emitted by thermal power plants of the national grid using diesel, residual (bunker), coal and natural gas.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermolectric production with natural gas in combined cycle plants replacing most of the other plants with oil, of all types. National policies, sectoral policies and the new natural gas exploitation "Camisea" particular circumstance foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/Gwh for the national grid. Using that emission factor it is expected that "Machupicchu" project will displace around 391,136 tCO₂e/year for the first phase and for the second phase 281,792 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The first phase is already built and is in operation since mid 2001. The second phase is under development and it is expected to enter in operation in 2008.

Estimate of time required before becoming operational

First phase is in operation since 2001.

Second phase: 2 years

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

First phase have completed all phases less than application to the CDM. Second phase has:

- Authorisation for the use of the water resources was given
- Environmental study approved
- Definitive Concession granted by Resolución Suprema N° 076-94-EM
- Feasibility Study completed
- Authorisation for the second phase project development (Oficio N° 541/2005 PROINVERSIÓN, Nov. 17th 2005)

Estimated Emission Reductions

Phase One

Annual: an average of 391,136 tCO₂e

- Up to and including 2012: 4,302,496 tCO₂e
- Up to a period of 10 years: 3,911,360 tCO₂e
- Up to a period of 7 years: 2,737,952 tCO₂e
- Up to a period of 14 years: 5,475,904 tCO₂e

Phase Two

Annual: an average of 281,792 tCO₂e

- Up to and including 2012: 1,408,960 tCO₂e
- Up to a period of 10 years: 2,817,920 tCO₂e
- Up to a period of 7 years: 1,972,544 tCO₂e
- Up to a period of 14 years: 3,945,088 tCO₂e

Project Benefits

- The hydroelectric plant will bring new jobs during the construction phase for the local community.
- The project will increase the amount of taxes that the government receives. By law some percentage of the taxes have to invested in the area of the project.
- "Machupicchu" fulfil the environment norms through the approval of its Environmental Impact Study by the Ministry of Energy and Mines. The local farmers approved the project and have been well informed about the scope of the project

Project Participant and Financing

Total project cost estimate:

Phase II

- Total project costs: US\$ 57,500,000

Sources of finance to be sought or already identified:

- Equity: 30% Own resources by EGEMSA
- Debt: 70%
- Carbon finance contribution sought: As much as we can have in advance.

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138 KV Transmission Line Tayabamba – Llacuabamba Project

The area of the 138 KV TL Tayabamba – Llacuabamba Project, of MARSA and HORIZONTE, is located in the Eastern Cordilleran range, 600 km straight line NE of Lima, and comprehends nearly the entire Patáz province of the La Libertad department. The project prolongs 31,5 km, the government 138 KV transmission line from Tayabamba to Llacuabamba, and constructs 5 substations and 11,5 km of primary 22.9 KV lines towards Retamas and San Andrés, operations centers of HORIZONTE and MARSA gold mining companies. The two companies consume approx. 340,000 gallons of diesel oil per month. The interconnection to SEIN (Sistema Interconectado Nacional) allows removing 18.000 CO₂ t per year, generating the equivalent amount of Certified Emissions Reductions (discounting the emission factor of SEIN).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

The Tayabamba – Llacuabamba Transmission Line will displace GHG emitted by the thermal power plants of MARSA and HORIZONTE, which use approx. 340.000 gallons of diesel oil per month, replacing this generation with energy from the SEIN system.

What would the future look like without the proposed CDM project?

The interconnected load of MARSA and HORIZONTE makes it possible to electrify the Patáz province. The great distance to the SEIN system makes it technically very difficult to operate a line to Patáz province without connecting the electric load of the mining companies to balance all the system. Only thus it is possible to extend the electric frontier to the province and to replace the diesel generation of the companies and localities.

What would the estimated total greenhouse gas (GHG) reduction be without the project?

According to the Consolidated Methodology ACM002, in a preliminary study of the World Bank, at the beginning of 2005, an Emission Factor of 0,8 tCO₂e/gwh was obtained for the diesel generators, and 0,56 for energy of the SEIN. Using these factors, it is expected that the Tayabamba-Llacuabamba Transmission Line will displace near 18.000 tCO₂e/year (which otherwise will be emitted with thermal power using diesel oil).

Current Status

Earliest project start date

Construction of the project is in the initial phase, start up is expected at the end of the first quarter of 2006.

Estimate of time required before becoming operational

4 months

What is the project lifetime?

30 years

Current status or phase of the project:

- Definitive Concession – Transmission of Electrical Energy –Approved by The Ministry of Energy and Mines.
- Environmental Impact Study approved by The Ministry of Energy and Mines and the National Institute for Natural Resources (INRENA).
- Rights of Way, obtained and approved.
- Feasibility and Detailed Engineering Studies Completed.
- Financing of the Project –Approved and proceeding.
- Project now in the construction Stage.

Estimated Emission Reductions

Annual: an average of 18,000 tCO₂e

- Up to and including 2012: 126,000 tCO₂e
- Up to a period of 10 years: 180,000 tCO₂e
- Up to a period of 14 years: 252,000 tCO₂e

Project Benefits

- It will improve the environmental image of the companies and communities that now generate electricity with diesel oil.
- Use of high quality and cheap energy will promote efficient natural resources development of the province, improving the quality of life and productive economy and activities of the rural communities.
- Electrification of the province will create new sources of work. The province has an area of 4,226,53 km² and an estimated population of 75,000 inhabitants. 45% of the houses do not have any basic service; and less than 30% of the inhabitants have economic activity (mainly in agriculture).
- The Tayabamba-Llacuabamba TL is constructed under international environmental standards and has received approval of the Ministry of Energy and Mines (MEM) and of Instituto de Recursos Naturales (INRENA).

Project Participant and Financing

Total project cost estimate: US \$ 9,300,000

- Development cost (studies, administration): US\$ 450,000
- Installed cost: US\$ 8,700,000
- Other Cost (rights of way) US\$ 150,000
- Total project costs: US\$ 9,300,000

Sources of finance to be sought or already identified:

Financing of the Project is by Crédito Leasing S.A. Financing is approved and being executed.

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«Los Perros / Bayovar» Wind Energy Project

The Project is the first great scale Wind Energy Project in Peru. The wind measurements in the «Great Desert of Sechura», in Peru's northern coast, indicates a extreme stable wind regime, making the project feasible under the normal energy market conditions. The 20 MW grid connected wind energy project will replace energy generated by the oil fired thermo-electrical power plants, mainly operating in the northern part of Peru's national grid system. Referring to baseline studies the project will reduce 24,000 tCO₂e yearly due to replacement of the emissions of the grid connected thermo electrical facilities. The project's total CDM contribution will be much higher, since the project will construct a transmission line, to connect former isolated, diesel-generator supplied, townships to the national grid.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

Since the marginal costs of the generation by the wind turbines are very low, the wind energy facility will be dispatched whole the time. This will replace energy and GHG emissions normally generated by the cost expensive thermo-electrical power plants using diesel, bunker, coal and natural gas.

Additionally the project will connect an isolated township (Bayovar) in the desert of Peru. The great fishery industry is using 10 MW diesel generators for energy supply. The grid connection of the township will make it possible to replace these Off-grid power plants, with its related GHG emissions.

What would the future look like without the proposed CDM project?

Probably future additions to the grid basically will be thermoelectric plants using natural gas in combined cycle process replacing this way most of the other facilities with oil, of all types.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

«Tarucani» will displace more than 175,000 tCO₂e/year which otherwise will be emitted by thermal power plants with diesel, residual (bunker), carbon and natural gas.

Current Status

Earliest project start date

Start of commissioning: January 2006

Estimate of time required before becoming operational

1 year after project commissioning (end of 2006)

What is the project lifetime?

21 years

Current status or phase of the project eg: which of the following phases have been completed:

- Pre-Feasibility Study finished
- Two years of wind measurements on 40m, 30m and 20m height on going at project's site
- PPA negotiations started.
- Debt financing identified

Estimated Emission Reductions

The estimated emission reductions have two components:

- a) Replacement of GHG gas emissions in the national grid system
- b) Replacement of the existing Off-Grid diesel generators due to the construction of a transmission line

- The contribution of a) is estimated to yearly: 24,000 tCO₂e due to the baseline studies of Peru
- The contribution of b) has to be studied.

Project Benefits

Peru's energy generation highly depends on hydro power and thermo electrical power. Due to climate changes the first is assumed to decrease within the next years. The project will be the first wind energy project in Peru, diversifying the energy generation of the country. Almost 90% of the Peruvian coast is deserted land, with an excellent wind regime. The project is assumed to have a key function for future development of renewable energy projects in Peru. Additional benefit of the project is the improvement of the infrastructure in the deserted region and the connection of the isolated township of Bayovar replacing off-grid diesel generation.

Project Participant and Financing

Total project cost estimate:

Development and Engineering Costs: US\$ 1,100,000
Direct costs of generation equipment: US\$ 22,400,000
Direct costs of transmission equipment: US\$ 2,400,000
Miscellaneous costs: US\$ 500,000
Total Costs: US\$ 26,400,400

Sources of finance to be sought or already identified:

- 20% Equity (partly identified)
- 80% Soft Loan Debt (application in process)

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CDM in Peru

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Perú: «Huaycoloro Landfill Gas Recovery Project»

The landfill on which the project will be developed is a private property and has an area of 1,575 hectares. Nowadays, this landfill receives about half of the MSW of the city of Lima. Up to the moment Huaycoloro is 11 years old and has accumulated 5.7 million tons of MSW and nowadays receives 2,500 tons of daily MSW. Currently, the landfill does not have a system of gas collection, which is not needed by law. It only has some wells for security reasons and a small portion is flared with little supervision and control. The project consists of the installation of a methane collection and flare system, to be placed in the cells of Huaycoloro's landfill.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

Methane emission will be destroyed through a collection and flare system, to be placed in the cells of Huaycoloro's landfill. Through this process the methane turns in CO₂, producing a reduction in the GWP since CO₂ has 21 times less GWP than CH₄.

What would the future look like without the proposed CDM project?

Nowadays the landfill does not have a system of gas collection, which is not needed by law. It has only some wells for security reasons and a small portion is flared with little supervision and control.

In Peru, according to its legislation and business as usual practices, without the project, Huaycoloro landfill will continue emit methane to the atmosphere, increasing its generation as the MSW increase.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

It has been estimated that only by the process of methane flaring and therefore its transformation to CO₂, the project would reduce 4,251,755 tCO₂e in a period of 14 years.

Current Status

Earliest project start date

The construction of the project is planned to begin on June 2005. The operation is assumed to start in 2006.

Estimate of time required before becoming operational

6 months

What is the project lifetime?

30 years

Current status or phase of the project eg: which of the following phases have been completed:

- The Project have a letter of intention with the World Bank, and it could sign the ERPA in May
 - Pre - feasibility study made by the World Bank
 - PDD in process
 - A letter communicating the intention to develop a CDM projects has been already send to the Designated National Authority on CDM
- PETRAMAS, the owner company of Huaycoloro Landfill, has received already many proposals to develop a Landfill Gas recovery projects. These proposals are still under evaluation and that even included the finance of the project.

Estimated Emission Reductions

Annual: an average of 303,697 tCO₂e

- Up to and including 2012: 2,006,318 tCO₂e
- Up to a period of 10 years: 2,701,040 tCO₂e
- Up to a period of 7 years: 1,680,583 tCO₂e
- Up to a period of 14 years: 4,251,755 tCO₂e

Project Benefits

- The principal effect is the decrease of pollution at local and global level, which would not happen in absence of the project. The local pollution affects the health of the nearby population.
- The sale incomes of CER's will allow the company to make sustainable the operation and maintenance of units and infrastructure adopted for the collection, transfer and final disposition of solid waste. It will allow attending the demand of the municipalities with minor resources, which up to the date deposit their residues in the public via or in clandestine places. This will improve the wellbeing of some of the poorest areas of the city.
- In addition it will allow realizing complementary investments, as ovens for toxic waste elimination that would use, as a fuel, the methane generated in the landfill.

Project Participant and Financing

Total project cost estimate:

- Development costs US\$ 200,000
- Installed costs US\$ 1,800,000
- Total project costs: US\$ 2,000,000

Sources of finance to be sought or already identified:

- Equity: The Invest will be financing only with capital. Petramas is evaluating a capital and operator partner.
- Carbon finance contribution sought: it is expected that the project would be financed with the guaranty of CER's sale.

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«Portillo Grande Landfill Gas Recovery Project»

The Portillo Grande landfill, where the Landfill Gas Recovery Project will be developed, belongs to the Metropolitan Municipality of Lima, was given under concession contract to Relima (Vega Group, Brazilian and French capital). The landfill has an area of 307 hectares that currently receive 30% of the Municipal Solid Waste (MSW) of Lima around 1500 tones per day. This landfill is 13 years old and has accumulated 4.2 million tons of MSW. This landfill has the capacity to receive 2000 tons for the next 30 years. Nowadays the landfill does not have a system of gas collection, which is not needed by law. It has only some wells for security reasons and a small portion is flared with little supervision and control. The project consists of the installation of a methane collection and flare system, to be placed in the cells of Portillo Grande landfill.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

Methane emission will be destroyed through a collection and flare system, to be placed in the cells of Portillo Grande's landfill. Through this process the methane turns in CO₂, producing a reduction in the GWP since CO₂ has 21 times less GWP than CH₄.

What would the future look like without the proposed CDM project?

Nowadays the landfill does not have a system of gas collection, which is not needed by law. It has only some wells for security reasons and a small portion is flared with little supervision and control.

In Peru, according to its legislation and business as usual practices, without the project, Portillo Grande landfill will continue emit methane to the atmosphere, increasing its generation as the MSW increase.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

It has been estimated that only by the process of methane flaring and therefore its transformation to CO₂, the project would reduce 4,194,792 tCO₂e in a period of 21 years.

Current Status

Earliest project start date

The construction of the project is planned to begin on March 2006. The operation is assumed to start in 2007.

Estimate of time required before becoming operational

1 year and a half

What is the project lifetime?

30 years

Current status or phase of the project eg: which of the following phases have been completed:

- Identification and pre-selection phase
 - A letter communicating the intention to develop a CDM projects has been already send to the Designated National Authority on CDM
- The municipality of Lima is evaluating how to develop the projects and is taking conversations with several carbon buyers in order to find the best deal. The municipality is interested in finance the project with the payment in advance of a portion of the sell of CERs.

Estimated Emission Reductions

- Up to and including 2012: 935,507 tCO₂e
- Up to a period of 10 years: 1,689,863 tCO₂e
- Up to a period of 7 years: 1,040,175 tCO₂e
- Up to a period of 14 years 2,729,379 tCO₂e
- Up to a period of 21 years: 4,982,820 tCO₂e

Project Benefits

The principal effect is the decrease of pollution at local and global level, which would not happen in absence of the project. The local pollution affects the health of the nearby population.

The sale incomes of CER's will allow the Metropolitan Municipality of Lima to make sustainable the operation and maintenance of units and infrastructure adapted for the collection, transfer and final disposition of solid waste. It will allow attending the demand of the municipalities with minor resources, which up to the date deposit their residues in the public via or in clandestine places. This will improve the wellbeing of some of the poorest areas of the city.

Project Participant and Financing

Total project cost estimate:

- Development costs: Around US\$ 200,000
- Installed costs: Around US\$ 1,400,000
- Total project costs: Around US\$ 1,600,000

Sources of finance to be sought or already identified:

- Equity: The municipality is looking for an investor partner
- Debt: no identified yet
- Carbon finance contribution sought: it is expected that the project would be financed with an up front payment for the CER's sale.

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CDM in Peru

Good business with Sustainable Development



Municipal Solid Waste Sustainable Management of the Historical City of Cusco and Surroundings –»RETAMA» Project

The project involves the treatment of 400 tons of Municipal Solid Waste (MSW) of the historical areas of Cusco city and surroundings areas that belong to the Vilcanota Valley, and the closure of the Landfill of Cusco and open dumps. Currently, 180 tons of MSW are disposed on rivers and open landfills, the remaining; around 220 tons of MSW are disposed in adequate sanitary landfills which 60% of the waste is organic. The project comprises not only the treatment of the organic part of the MSW through a composting and humus plant but also the recycling of the inorganic waste. However, it is estimated that between 15-20% of the MSW is not usable for commercial purposes. For this, residual waste, it is planned for a second stage of the project to develop an incinerator with a power capacity of 6 MW. Nowadays a small pilot program is running producing 4 tones of compost per day. The definitive project and the MSW collection system is planned to be given in concession or privatization.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

Methane emissions from the landfill and open dumps of Cuzco will be displaced through:

1. A composting and humus system and an incinerator. Through this process methane (CH₄) emissions are avoided leaving only the emission of CO₂.
2. Methane emission will be destroyed through a collection and flare system, to be placed in the landfill of Cusco once it is closed. Through this process the methane turns in CO₂, producing a reduction in the Global Warming Power (GWP) since CO₂ has 21 times less GWP than CH₄.

What would the future look like without the proposed CDM project?

According to legislation, poverty conditions, and business as usual Practices, the landfill of Cusco will still in operation together with open dumps. The landfill not has a gas collection system, which is not required by law. It has only some wells for security reasons and a small portion is flared with little supervision and control. Due to lack of resources and poverty open dump will still also in operation.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

It has been estimated that the project would reduce around 2,078,320 tCO₂e in a period of 21 years.

Current Status

Earliest project start date

The construction of the project is planned to begin on July 2005. The operation is assumed to start in January 2006.

Estimate of time required before becoming operational

1 year and a half

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- A pilot project is currently under operation.
- Financing of the composting and recycling stage are closed. For the incinerator no yet.
- Pre – feasibility study is done.
- It is one of the main components of the municipality strategy for the development of Cusco city
- A letter communicating the intention to develop a CDM projects has been already sent to the Designated National Authority on CDM

Estimated Emission Reductions

- Up to and including 2012: 520,132 tCO₂e
- Up to a period of 10 years: 807,262 tCO₂e
- Up to a period of 7 years: 520,132 tCO₂e
- Up to a period of 14 years: 1,235,204 tCO₂e
- Up to a period of 21 years: 2,078,320 tCO₂e

Project Benefits

- The principal effect of the project is to provide a final solution for the problem of final MSW disposition management for an area considered as one of the main cultural heritage site worldwide.
- The project will move the final destination of MSW outside of natural sanctuaries.
- The creation of employment for 400 people activities related to composting, recycling and gathering.
- To serve as a platform for training and research.
- Provide a source of fertilizers to the crops of the area and inputs for the industry
- Avoid pollution of rivers and improvement of the citizens health.
- The revenues from CER's will contribute to the company to make sustainable the operation and maintenance for an adequate management of the collection, transfer and final disposition of Municipal Solid Waste.

Project Participant and Financing

Total project cost estimate:

- Costs for the implementation of the recycling and composting: US\$ 1,500,000
- Cost for the renewal of the MSW trucks fleet US\$ 5,000,000
- Incinerator with electrical power plant: US\$ 15,000,000
- Total project costs: Minimum: US\$ 1,500,000 Maximum: US\$ 21,500,000

Sources of finance to be sought or already identified:

- Equity: US\$ 500,000 Municipality of Cusco
- Debt: US\$ 1,500,000 World Bank loan
- Carbon finance contribution sought: As much as the project can have in advance.

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CDM in Peru

Good business with Sustainable Development



Perú: «Power Generation using Municipal Solid Waste as Fuel- Iquitos

Iquitos the main and biggest city in the Peruvian Amazon Jungle, like all jungle cities have a severe waste management problem since due to very superficial underground water table level cannot establish a good landfill program. The city presently collects an average 340 MT of solid wastes, additionally it produces an average 30 MT of sawmill by-products that are presently burned.

The project envisions establishing a 10 MW Power plant that will use the MSW plus Sawmill waste as fuel for generation, waste will be subject to a Pyrolysis process in order to gasify all organic origin waste which accounts for around 75/80% Of total production, all of which will be used. Non-organic waste such as glass, & metal (ferrous & non-ferrous) will be recycled and only a small percentage formed by gravel, and construction debris will continue to be sent to the landfill. Plant will be establish on the current area used for landfill which will allow drilling and establishing a methane gas collection system to be used for additional fuel. The project consists of the installation of a methane collection and flare system, to be placed in the cells of Huaycoloro's landfill.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

Methane emission of existing landfill will be destroyed through a collection system. Through this process the methane turns in CO₂, producing a reduction in the GWP since CO₂ has 21 times less GWP than CH₄.

All future methane emissions will be avoided by using the methane produced by the Pyrolysis process as fuel for Power Generation. Only non-polluting wastes will be either recycled and/or sent to landfill.

What would the future look like without the proposed CDM project?

As mentioned the Amazonian Jungle has a severe problem for establishing landfills, currently the system used is to use small ravines and fill them up.

Nowadays the landfill does not have a system of gas collection, and actual covering of the MSW is very defective causing a severe emission problem.

In Peru, according to its legislation and business as usual practices, without the project, landfill will continue emit methane to the atmosphere, increasing its generation as the MSW increase.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

It has been estimated that the complete process will reduce 165,107.07 tCO₂e annually in a period of 10 years.

Current Status

Contract has been signed with the local Municipality by which company will build and own the plant for 10 years and then turn it over to Municipality.

Financing of the project is nearing completion.

The construction of the project is planned to begin by the end of this year. The operation should start 12/15 months after breaking ground.

Estimate of time required before becoming operational

1 year and a half

What is the project lifetime?

30 years

Current status or phase of the project eg: which of the following phases have been completed:

- Feasibility study is finished
- Contract Has been signed with Maynas Provincial Municipality
- Financing is currently nearing completion.

Preliminary engineering is set to start as soon as financing is approved and disbursed. Pre selling CER's will help firm up financing the whole cost of the project.

Estimated Emission Reductions

Annual: an average of 165,107.07 tCO₂e

- Up to and including 2012: 1,023,608.36 tCO₂e
- Up to a period of 10 years: 1,466,841.63 tCO₂e
- Up to a period of 7 years: 1,155,749.49 tCO₂e
- Up to a period of 14 years: 2,311,498.91 tCO₂e
- Up to a period of 21 years: 3,956,055.43 tCO₂e

Project Benefits

• The principal effect is the decrease of pollution at local and global level, which would not happen in absence of the project. The local pollution affects the health of the nearby population. As well as endangers the very fragile Amazon Jungle environment, the world largest Oxygen generating area.

• The sale incomes of CER's will allow the company to make sustainable the operation. One very significant social benefit will be to allow a significant reduction of power costs as the Amazon Jungle has no possibilities of using Hydroelectric power generation and is therefore forced to use only Oil based generation This will improve the wellbeing of some of the poorest areas of the city.

• In addition it will reduce the destruction of current jungle area needed for future landfills since plant will not use up additional areas for the future.

• Power Generate by this system will substitute around 35% of current power generated using fossil fuel, thus reducing emissions of this source.

• Finally, the project will reduce the amount of crude oil shipped using river barges.

Project Participant and Financing

Total project cost estimate:

- Development costs US\$ 250,000
- Installed costs US\$ 21,000,000
- Total project costs: US\$ 21,250,000

Sources of finance to be sought or already identified:

- Equity: An American company will provide all financial resources for the project and will operate the plant for ten years.
- Debt: to be determined
- Carbon finance contribution sought: it is expected that the project would be financed with an up front payment for the CER's sale.

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CDM in Peru

Good business with Sustainable Development



Public Transportation System based on High Capacity Buses using Exclusive Roads / PROTRANSPORTE. Metropolitan Municipality of Lima

The project aims to develop a massive public transportation system, for low income population, which will be more economic, faster, and more orderly than the current system. The system comprises a fleet of high capacity buses running in exclusive roads. The system is planned to work similarly as a metro system.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

The Project will displace emissions from old, bad maintained, small transportation units which are using the roads where the Project will be developed. The main emission is CO₂. Other gases are: CO, SOX, NOX.

What would the future look like without the proposed CDM project?

The current system will continue that means over supply of transportation units composed mainly by small second hand transportation units brought from Japan with low occupancy percentage. The impact of the current system is expressed on more frequent respiratory illnesses, road accidents, high operational cost, poor transportation workers, longer commuting time etc.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

«PROTRANSPORTE» project will displace around 199,743.90 tCO₂e/year which otherwise will be emitted by small diesel transportation units.

Current Status

Earliest project start date

The construction of the project it is planned to begin on July 2005. The operation is assumed to start in 2006.

Estimate of time required before becoming operational

1 year

What is the project lifetime?

20 years

Current status or phase of the project eg: which of the following phases have been completed:

- The municipality of Lima has already taken the decision to develop the project.
- The project has the endorsement of the Ministry of Economy and Finances.
- Feasibility study is finished.
- Financing negotiations are closed
- A letter communicating the intention to develop a CDM projects has been already send to the Designated National Authority on CDM

Estimated Emission Reductions

Annual: an average of 199,743.90 tCO₂e

- Up to and including 2012: 1,198,463.4 tCO₂e
- Up to a period of 10 years: 1,997,439 tCO₂e
- Up to a period of 7 years: 1,398,207.30 tCO₂e
- Up to a period of 14 years: 2,796,414.60 tCO₂e

Project Benefits

- Reduction of de 10,512.8 MT annually of the pollutants: PM, NO₂, SO₂, CO, HC, y Pb.
- It is estimated that the concentrations of the pollutants PM_{2.5} will be reduced by 25% the urban area where the Project will operate.
- Reduction in operational cost (first year): US\$ 49,665,978
- Saving in commuting time (first year): US\$ 8,113,149
- Improvement of the urban environment

Project Participant and Financing

Total project cost estimate:

- Development costs: US\$ 3,200,000
- Installed costs: US\$ 114,100,000
- Private Investment (Bus fleet): US\$ 80,000
- Other costs: US\$ 17,100,000
- Total project costs (Public Private Partnership): US\$ 214,500,000

Sources of finance to be sought or already identified:

- Equity: Metropolitan Municipality of Lima: US\$ 44,000,000
- Debt: World Bank: US\$ 45,000,000
- Inter.-American Development Bank: US\$ 45,000,000
- Carbon finance contribution sought: We are interested in higher prices for CER's and a contribution in advance.

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CDM in Peru

Good business with Sustainable Development



Mass Transit Electric System Project for Lima and Callao / Electric Train Autonomous Authority. Metropolitan Municipality of Lima

The project aims to endow a mass transit electric system, for high density population and peripheral zones in Lima and Callao cities; reducing greenhouse gas emissions (GHG), produced by conventional public transportation units, to be substituted by this transit electric system, non pollutant.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

The Project will displace emissions from old, bad maintained buses and vans running along and around the planned lines of this rapid and clean transportation system. The main emission is CO₂. Other gases are: CO, SO_x, NO_x.

What would the future look like without the proposed CDM project?

The current system will continue. That means oversupply of transportation units composed mainly by small second hand transportation units brought from Japan with low occupancy percentage. The impact of the current system is expressed on more frequent respiratory illnesses, road accidents, high operational cost, poor transportation workers, long time for travelling etc.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

Without this project there will be an increase of Greenhouse gas emissions. Clean air initiative committee has calculated emissions of road traffic in Lima and Callao for year 2002: CO 236,048 TM, CO₂ 4,438,166 TM and NO_x 53,417 TM, summing up 21,233,485 tCO₂e/year. This figure will increase to 27,171,186 tCO₂e in 2007 (28 %).

Current Status

Earliest project start date

The construction of the project is planned to begin on September 2005. The operation is assumed to start in 2007.

Estimate of time required before becoming operational

2 years

What is the project lifetime?

33 years

Current status or phase of the project eg: which of the following phases have been completed:

- By the Metropolitan Council agreement N° 212, the project is in public international bidding process for its concession.
- The Republic Congress in its plenary session of May 20, 2004, declared the continuation of the mass transit electric system for Lima and Callao as priority necessity.
- The Peruvian Government has approved the endorsement of a US\$ 120 million loan for the project by Supreme Decree N° 038-2005-EF.
- Feasibility study and detailed engineering are completed.
- A letter communicating the intention to develop a CDM project has been already send to the Designated National Authority on CDM

Estimated Emission Reductions

Annual: an average of 200,000 tCO₂e, year 2002.

- Up to and including 2012: 1,200,000 tCO₂e
- Up to a period of 10 years: 2,000,000 tCO₂e
- Up to a period of 7 years: 1,400,000 tCO₂e
- Up to a period of 14 years: 2,800,000 tCO₂e

Project Benefits

- Reduction of 158,722 MT annually of the pollutants: CO, CO₂, HC, NO_x, PM, y SO₂.
- Reduction of operating cost of urban transportation system (first year): US\$ 118,792,870
- Saving in commuting time (first year): US\$ 28,276,694
- Improvement of the urban environment

Project Participant and Financing

Total project cost estimate:

- Development costs: US\$ 3,000,000
- Installed costs: US\$ 183,841,000
- Private Investment: US\$ 10,000,000
- Other costs (vehicle elimination): US\$ 15,000,000
- Total project costs: US\$ 198,841,000

Sources of finance to be sought or already identified:

- Equity: US\$ 10,000,000
- Debt: US\$ 147,185,000
- Carbon finance contribution sought: US\$ 15,000,000 (for a vehicle elimination program).

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CDM in Peru

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«Garodi» Biodiesel Plant

The project consists in the construction of a Biodiesel plant for a production of 10,000,000 liters per year. The biodiesel will be sold in gas stations to be sold in diesel automobiles. Any conventional diesel engine can use diesel mixed with biodiesel or even pure biodiesel. The input to produce the biodiesel will be gotten from sustainable Palm plantations, recycled vegetable cook oil and some portion of fish oil. It is expected that the project will reduce Green House Gases since, the combustion of Biodiesel or any kind of sustainable biomass is considered to have no net impact on carbon dioxide emissions, because the Carbon dioxide emitted upon combustion is assumed to be exactly offset by the capture of Carbon dioxide during the re-growth of the biomass. The project will reduce 26,960 tCO₂e annually by displacing 10,000,000 liters per year of diesel that otherwise will be combusted in automobile diesel engines.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?
CO₂ emission emitted by diesel automobile engines.

What would the future look like without the proposed CDM project?

Diesel Cars will still use pure diesel in their engines emitting Carbon dioxide (CO₂) among other pollutants of high local negative impact. Currently none cars in Peru use biodiesel. Most of trucks and half of cars use diesel in Peru. For diesel trucks and cars is hard to convert to natural gas so it is expected that the use of diesel will still be a common practice.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

Assuming that each litre of Biodiesel displaces exactly one litre of diesel in the combustion performance in diesel cars, the project will displace 10,000,000 litres per year of diesel. By calculating the fuel consumption impact on carbon dioxide emissions through knowing the net calorific value of diesel and its carbon content, it is calculated that the project will reduce 26,960 tCO₂e annually that otherwise will be emitted by automobile diesel engines using pure diesel.

Current Status

Earliest project start date

The installation of the project is planned to begin on May 2005. The operation is assumed to start in July 2005.

Estimate of time required before becoming operational
3 months

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- The machinery and equipment is in construction. In two months will be finished.
- The financing for the equipment is closed; working capital is in negotiations with banks. CER's are required to strength financial ratios for this pioneering project.
- The authorisation with the health department of the Ministry of Health is in process (DIGESA).
- Contract in negotiations with mayor restaurants to acquire used cook oil.

Estimated Emission Reductions

Annual: an average of 26,960 tCO₂e

- Up to and including 2012: 188,720 tCO₂e
- Up to a period of 10 years: 269,600 tCO₂e
- Up to a period of 7 years: 188,720 tCO₂e
- Up to a period of 14 years: 377,440 tCO₂e

Project Benefits

- The project will demand palm oil from a rain forest area of Peru that is very poor and become an attractive alternative to the coca illegal plantations.
- Diesel in Peru has a high content of sulphur and with combustion emit sulphur dioxide a high impact local pollutant. Biodiesel does not content sulphur.
- Biodiesel is a renewable source of energy, Diesel no.
- The project will contribute to improve the deficit in the trade balance in Peru since Biodiesel contrary to diesel is produced locally.
- The project will provide 20 permanent jobs.

Project Participant and Financing

Total project cost estimate:

- Machinery and equipment: US\$ 200,000
- Working Capital: US\$ 400,000
- Total project costs: US\$ 600,000

Sources of finance to be sought or already identified:

- Equity: US\$ 200,000
- Debt: US\$ 400,000
- Carbon finance contribution sought: As much as we can have in advance.

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CDM in Peru

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«Paramonga» CDM Bagasse Boiler Project

Agroindustrial Paramonga S.A. AIPSA, is one of the largest sugar companies in Peru, producing approximately 110 thousand metric tonnes of sugar annually, which represents an 11% share of the total national sugar production. The main objective of the CDM Project is to generate the financial resources necessary to change the energy generation system of Agro Industria Peruana S.A. – AIPSA, from the actual residual fuel oil based energy generation system, to a new sugar cane bagasse energy system. The project will replace the existing boilers with a new bagasse one, displacing the use of residual fuel oil with renewable energy and zero net greenhouse gas emissions. The project activity conforms to the requirements for a small scale project because it will utilize bagasse boiler with an installed capacity of 13.6 MWth, according to the following specifications of the manufacturer of the equipment.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

The project will substitute two boilers which consume primarily residual fuel oil, complemented by residual pith and bagasse; with one new boiler that uses only bagasse and pith. In this way, a fossil fuel will be displaced by renewable fuels; therefore the net GHG emissions associated with the fossil fuel burning will be eliminated.

The greenhouse gas emissions from fuel consumption of the existing petroleum boilers that would have been used in the absence of the CDM activity for generating thermal energy to the AIPSA sugar processing plant would have been net 873,394 tCO₂e during the crediting period.

What would the future look like without the proposed CDM project?

The new boiler will produce steam for use in the sugar production process that would otherwise be generated by residual fuel oil, technically Bunker Fuels N° 6 and N° 500.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

The use of bagasse will allow the reduction of around 87,000 tCO₂e annually.

Current Status

Earliest project start date

April, 2006

Estimate of time required before becoming operational

One year

What is the project lifetime?

30 years

Current status or phase of the project eg: which of the following phases have been completed:

- The feasibility study is finished
- The environmental impact studies is finished
- The Project was approved by Designated National Authority on CDM
- The project has a Project Design Document submitted to UNFCCC

Estimated Emission Reductions

Annual: an average of 87,339 tCO₂e

- Up to and including 2012: 611,373 tCO₂e
- Up to a period of 10 years: 873,394 tCO₂e
- Up to a period of 7 years: 611,373 tCO₂e
- Up to a period of 14 years: 1,222,746 tCO₂e

Project Benefits

- The project will contribute to sustainable development because it will displace a fossil fuel system with a biomass based renewable energy system, generating benefits not only by reducing greenhouse gases, but by also reducing other local air pollutants and environmental impacts associated with the burning of residual fuel oil which have deteriorated the local environment.
- The current pollution problems will be replaced by vapour and reduced particulate emissions from the controlled burning of bagasse in the new boiler, which includes a high efficiency wet scrubber.
- The project will contribute significantly to reducing global warming by displacing 873,394 tCO₂e during 10 years.

Project Participant and Financing

Total project cost estimate:

- Total project costs: US\$ 5,369,000

Sources of finance to be sought or already identified:

- Equity: US\$ 869,000
- Debt: US\$ 4,500,000
- Carbon finance contribution sought.

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Unfortunately there are no detailed information available about that project.

CDM in Peru

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HEAVEN Biodiesel Production and Distribution for Automobile Transportation in Lima Peru

This Project will take place in Lurín – Lima; the total area is around 30,100 square meters. The project consists in the construction of a Biodiesel plant for a production of 60,000 gallons per day or 82,782,000 liters per year. The biodiesel will be used as a substitute of diesel, furthermore any conventional diesel engine can use diesel mixed with biodiesel. It is expected that the project will reduce Green House Gases since, the combustion of Biodiesel or any kind of sustainable biomass is considered to have no net impact on carbon dioxide emissions, because the Carbon dioxide emitted upon combustion is assumed to be exactly offset by the capture of Carbon dioxide during the re-growth of the biomass.

The project will reduce 223,182 tCO₂e per year that otherwise will be emitted to the atmosphere.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

Carbon Dioxide (CO₂) emissions emitted by diesel automobile engines.

What would the future look like without the proposed CDM project?

Diesel cars will still use pure diesel in their engines emitting carbon dioxide (CO₂) among other pollutants of high local negative impact. Currently none cars in Peru use biodiesel. For diesel trucks and cars it is hard to convert to natural gas so it is expected that the use of diesel will still be a common practice.

What would the estimated total greenhouse gas (GHG) reduction be without the project?

The project will reduce 223,182 tCO₂e annually by displacing 82,782,000 liters per year of diesel that otherwise will be combusted in automobile diesel engines.

Current Status

Earliest project start date

January 2006

Estimate of time required before becoming operational

2 months

What is the project lifetime?

Indefinite

Current status or phase of the project:

- Engineering studies are finished
- The feasibility study is finished
- Civil Works under execution
- Machinery Works under execution

Estimated Emission Reductions

Annual: an average of 223,182 tCO₂-equivalents

- Up to and including 2012: 1,562,278 tCO₂e
- Up to a period of 7 years: 1,562,278 tCO₂e
- Up to a period of 10 years: 2,231,824 tCO₂e
- Up to a period of 14 years: 3,124,556 tCO₂e

Project Benefits

- The Project fulfills the European standards of Peru and local people.
- Support its development.
- Biodiesel is a clean fuel because it does not contain sulphur. In the other hand diesel has a high content of sulphur and with combustion emits sulphur dioxide a high impact local pollutant.
- The principal effect is the decrease of pollution at local and global level, which would not happen in absence of the project.
- The project will contribute significantly to reducing global warming by displacing 2,231,824 tCO₂e during 10 years.

Project Participant and Financing

Total project cost estimate: US\$1,500,000

- Machinery and equipment: – – –
 - Working Capital: – – –
 - Total project costs: US\$ 1,500,000
- The Project is executed by HERCO S.A. financial contribution.

Sources of finance to be sought or already identified:

- Equity: – – –
- Debt: – – –
- Carbon finance contribution sought: As much as we can have in advance.

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CDM in Peru

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COMISA SUGAR CANE-ETHANOL PROJECT

The project is located in the north of Peru, in Sullana Province, Department of Piura, the project would implement 12 hectares of sugar cane crops with the propose to generate ethanol . Just to frame the project within the potential context of Sugar Cane for ethanol development in Peru, it is important to take into consideration that our country has a conservative potential of 1 million hectares to develop in the northern coast (it is not advisable to plant Sugar Cane in the Forest where only 6 to 7 months a year of cropping is possible versus 12 month of the coast). Being the first Ethanol distillery in Peru to come in operation mid 2008, COMISA will partially cover the projected internal demand for this product which balance would have to be covered from abroad. So besides the necessity to lower emissions, the bio-fuels as the ethanol will be applied to replace the fossils fuels. The Project has been finally defined for the exclusive production of ethanol with an initial level of 600,000 liters.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

Bio-fuels as the Ethanol will be applied to replace the fossils fuels and decrease of CO2 emissions. Other greenhouse gases emissions of this project are nitrous oxide (N2O) and Methane (CH4).

What would the future look like without the proposed CDM project?

Greenhouse gases emissions from fossil fuel consumption of diesel and petroleum that would have been used in the absence of the CDM. Also many other agro industrial and manufacturing activities will remain using fossil fuels.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

The ethanol production in 2 stages: 1,200,000 liter per day. It is calculated that the project will reduce 2,272,050 tCO2e annually that otherwise will be emitted to the atmosphere.

The project has the following components:

- Change of the fuel in the irrigation of 11,000 hectares
- Change from fuel to diesel to ethanol in the transport vehicles and field machinery
- Generation of energy with bagasse boiler for the industrial plant: The diesel use of the Bases Case is avoided for a total of 24 to 28 Mw.
- Increase in efficiency in the heat use in the Alcohol Refinery and effluent treatment.

Current Status

Earliest project start date

Ethanol distillery will come in operation in mid 2008

Estimate of time required before becoming operational

Two years.

What is the project lifetime?

20 years

Current status or phase of the project eg: which of the following phases have been completed:

- Under preparation: a Pre-feasibility report on the eligibility, pacing and potential of CER's generation under the CDM and recommendations on the viability to develop the Project under the CDM norms.
- CERs are required to strength financial ratios for this pioneering project.
- Pilot Project under execution.

Estimated Emission Reductions

Annual: an average of 192,000 tCO2e

- Up to and including 2012: 960,000 tCO2e
- Up to a period of 10 years: 1,920,000 tCO2e
- Up to a period of 7 years: 1,344,000 tCO2e
- Up to a period of 14 years: 2,688,000 tCO2e

Project Benefits

- The project would reduce diesel in agro industrial activities of CORMIPESA. Diesel has a high content of sulphur and with combustion emit sulphur dioxide a high impact local pollutant.
- The project will contribute to sustainable development because it will displace a fossil fuel system with a biomass based renewable energy system, generating benefits not only by reducing greenhouses gases, but by also reducing other local air pollutants and environmental impacts associated with the burning of residual fuel oil which have deteriorated the local environment.
- Provide a source of fertilizers to the crops of the area and inputs for the industry.

Project Participant and Financing

Total project cost estimate:

COMISA:
Project Value (Intangible)
Initial Assets Value: US\$ 15,000,000
Additional Capital (of CDM - CER): US\$ 10,000,000
INVESTOR:
Equity Investment: US\$ 15,000,000
TOTAL OWN CAPITAL: US\$ 40,000,000

Sources of finance to be sought or already identified:

- Equity: US\$ 15,000,000
- Debt: US\$ 400,000
- Carbon finance contribution sought: As much as we can have in advance.

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Chiclayo Rice Hull Power Plant

The objective of the Chiclayo Rice-Hull Fired Cogeneration Project is to generate electricity by burning rice hulls, a biomass fuel. The project will sell electricity to rice mills and to agricultural growers and currently off-grid pumping customers at below the current price they pay for diesel generated and grid based energy. This would result in a reduction in global greenhouse gas and local particulate matter levels, resulting in improved local health conditions.

The project will use rice hulls from a cluster of 25 – 30 rice mills, which currently process over 500,000 metric tons per year of rice. The rice hulls will be transported to a centralized location, within an average of 4 km of each mill, and used as fuel in specialized boilers to generate steam for electric power production. The initial stated aggregate power output from the plant will be 9.2 MW. The project proposal consider the possibility to increase up to 15 MW the mentioned aggregate power output.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

The Project will displace mainly CO₂ emissions produced by the operation of 125 water pumps diesel based. These diesel pumps use an average of tree gallon per hour working 300 days per year.

What would the future look like without the proposed CDM project?

Business as usual practices will continue. This means water pumps using diesel as fuel which currently could use more than 1.35 million gallons of diesel annually, and agricultural growers with electricity supply price that don't allow them to processing/conservation his production to obtain added value.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

For a maximum 21 years period total GHG reduction are estimated in 312,726 tCO₂e.

Current Status

Earliest project start date

II semester 2006

Estimate of time required before becoming operational

Two year

What is the project lifetime?

25 years

Current status or phase of the project eg: which of the following phases have been completed:

- The feasibility study is finished
- The environmental impact studies is under preparation
- Financing negotiations are not closed because CleanTech Fund will be the main investor.
- Project sponsors/promoters Monder SAC from Lima Perú and Eonegy International Corporation from Boulder Colorado USA and Lambayeque's Rice Mills Association have sign a Letter of Intent to became partners through the conformation of the company «Agroindustrias y Energia del Norte SAC» (AGRENSA) which will became owner of the project, this must be ready in May 2005.

Estimated Emission Reductions

Annual: an average of 14,891 tCO₂e per year.

- Up to and including 2012: 89,350 tCO₂e
- Up to a period of 10 years: 148,917 tCO₂e
- Up to a period of 7 years: 104,242 tCO₂e
- Up to a period of 14 years: 208,484 tCO₂e

Project Benefits

- Grid Diversification. Diversification of the power system away from fossil fuels
- Reduced Local Pollution. This project will also improve regional air quality by reducing N₂O, SO₂ (possibly) and particulate matter (PM) emissions associated with the burning of rice husks in open pits.
- Reduced Global Emissions. Avoidance of emissions from fossil fueled power plants, probably oil fired boilers, natural gas turbines, and/or natural gas combined-cycle power plants
- Reduced price of electricity. The rice mills are expected to be able to reduce their electricity prices by approximately 10-20%.
- Increased foreign and local investment. By showing the local and international community that independently operated renewable energy projects can be developed and managed profitably, this project should promote the further development of renewable energy technologies, further promoting foreign direct investment in environmentally sustainable projects in Peru.
- The new technology brought by the project will train technical workers in sound technologies and in the same time create conscience of responsible environmental management.
- The project would become the company autonomous on energy and would left enough bagasse to satisfy the demand of the paper factory close to the sugar refinery.

Project Participant and Financing

Total project cost estimate:

- Fixed capital: US\$ 12,945,000
- Variable start up cost: US\$ 2,218,464
- Interest during construction: US\$ 779,911
- Contingency: US\$ 682,356
- Total project costs: US\$ 16,625,732

Sources of finance to be sought or already identified:

- Equity (30%): US\$ 4,987,720
 - Clean Tech Fund US\$ 3,000,000
 - Others US\$ 1,987,720
- Debt (70%): US\$ 11,638,012

Note: The finance share structure could be changed in accordance to the interest/participation of new investors

- Carbon finance contribution sought: As much as we can have in advance.

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Sugar Cane Foliage for Steam and Green Power Generation

To get rid of the foliage (trash), farmers in the majority of the cane producing countries burn the sugar cane fields prior to harvest, thereby spoiling a valuable biomass resource. While the uncontrolled combustion of foliage in Peru generates emissions contributing to global warming, acidification and smog, the quantity of lost bio-energy corresponds to about 20% of the crude oil used for energy production in the country. Towards reverting this situation and to demonstrate a global opportunity, the project aims to incorporate foliage-fuel into the Peruvian National Energy Balance. Based on Swedish technology, whole cane harvesting and subsequent separation and use of cane foliage will facilitate a fossil fuel free production of sugar, paper (from bagasse), ethanol (from molasses) and other products. The technology is completely modular and equipped to continuously monitor the generated GHG-emission reductions, which facilitate project replication and low administration costs. The project, contributing with about 10-15% of the potential creation of CERs within the Peruvian sugar cane sector, will be localized in two of the twelve established mills of the country.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

According to IETA classification the project is mainly fuel-switching type A2.2 but A3.2, B2, C2.1, E1.1 and D2 is also included.

The Project will drastically reduce the emissions of cane field burning and displace mainly the CO₂e emissions produced by the use of bunker oil, diesel and/or natural gas in the sugar and bagasse paper industry. Fossil fuels will be replaced by sugar cane foliage and pith for heat & power generation in diverse industrial and services activities.

What would the future look like without the proposed CDM project?

Business as usual practices will continue. Part of the Peruvian produced bagasse is used as raw material for pulp & paper. This means sugar mills would continue to use fossil fuels. Also many other agro industrial and manufacturing activities will remain using fossil fuels. So no significant mitigation of GHG could be expected and fossil fuel dependency would keep on hindering the agro industrial sustainable economic and social development.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

For a maximum 21 years period total GHG reduction are estimated in 7,640,000 tCO₂e.

Current Status

Earliest project start date

June 2005

Estimate of time required before becoming operational

18 month

What is the project lifetime?

25 years, consider periodically replacement of mobile equipment (harvest & field-mill transport units)

Current status or phase of the project, which of the following phases have been completed:

- The pre-feasibility study is finished
- Internationally authorized environmental auditors have already emitted positive opinion on a Statement of Technology Supplier, including baseline calculation.
- Work with the CDM Project Design Document is ongoing.
- In March 2002 GEF (Climate change program) approved almost US\$ 1,000,000 mainly for the removal of non-technical barriers. Since April 2004, the project is in the pipeline of IFC as GEF executing agency.
- Financing negotiations are not closed.

Estimated Emission Reductions

- Up to and including 2012: 2,240, 000
- Up to a period of 10 years: 2,960, 000 (first 10 years)
- Up to a period of 7 years: 1,880, 000 (first 7 years)
- Up to a period of 14 years: 4,400, 000 (first 14 years)

Annual: an average of tCO₂e.

- 1st year: zero
- 2nd year: 8,000
- 3rd year: 72,000
- 4th year: 360,000

Project Benefits

- Grid Diversification. Diversification of the power system away from fossil fuels

• Reduced Local Pollution. This project will contribute to ameliorate the population health by reducing CO, N₂O, SO₂ and CH₄, N₂O, NOX, CO, VOC particulate matter emissions associated with the combustion of both bunker oil and/or burning of sugar cane foliage in open fields. Reduction of silicosis disease and a increased length of life perspective is also expected.

• Reduced Global Emissions. Avoidance of GHG emissions from fossil fuelled steam and power plants, probably oil fired boilers, natural gas turbines, and/or natural gas combined-cycle power plants.

• Reduced price of electricity. The use of sugar cane foliage and pith are expected to be able to reduce kW/h generation cost by approximately 25% - 30% compared to natural gas.

• Increased foreign and local investment. By showing the local and international community that independently operated renewable energy projects can be developed and managed profitably, this project should promote the further development of renewable energy technologies, further promoting foreign direct investment in environmentally sustainable projects in Peru.

• The new technology brought by the project will train technical workers in sound technologies and in the same time create conscience of responsible environmental management.

• The project would become the company autonomous on energy and would left enough bagasse to satisfy the demand of the paper factory close to the sugar refinery.

Project Participant and Financing

Total project cost estimate:

- Total project costs: In the level of US\$ 20,000,000

Sources of finance to be sought or already identified:

- IFC and various international entities pronounced interest in co-financing.
- Carbon finance contribution sought: 10% or minimum USD 1,000,000 in advance.

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La Calera Biogas project

Manure is produced in the farm by 3,000,000 hens and collected in a daily basis. It is then mixed with the dead chicken carcasses and introduced in two biodigesters which produce methane gas. This gas is completely burned for giving heat to the young chicken nursery. The amount of manure being actually used is 9 tons per day out of 75 tons produced daily. The possibility of building one or two new biodigesters is latent due to the amount of manure and mainly to the demand of heat which doubles during winter time.

Neither the two already built biodigester nor the next biodigesters are economically feasible because of the high cost of implementation and because of the debts in which the farm incurred for building the two first biodigesters in 1997 and 2003. Reductions will be determined in the near future but it is expected a great amount mainly for the avoidance of CH₄ emissions and also for displacing emissions of CO₂ from fossil fuels used in the heaters.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

CO₂ coming from fossil gas burned to heat the heaters of the poultry nursery, Methane gas coming from the anaerobic decomposition of animal waste and manure. These emissions are produced by the traditional management of Peruvian chicken farms.

What would the future look like without the proposed CDM project?

For the current project already built: A financial crisis due to the current debt can make the project collapse, increasing again the emission of CO₂ and CH₄ to the atmosphere.

For the new projects: Revenues coming from the sell of Certified Emission Reductions would be crucial for trigger the investment decision.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

Reductions will be determined in the near future but it is expected a great amount mainly for the avoidance of CH₄ emissions and also for displacing emissions of CO₂ from fossil fuels used in the heaters.

Current Status

Earliest project start date

Two biodigester are already built, one in 1997 and the other 2003. The construction of two new biodigesters are under evaluation.

Estimate of time required before becoming operational

Two biodigesters are in operation. The next two biodigesters probably in one year

What is the project lifetime?

Forever

Current status or phase of the project eg: which of the following phases have been completed:

- Two biodigesters have already enter into operation; however the size of the debt is putting on risk the operation of these biodigesters. The new biodigesters are planned to be build once company financial situation will be controlled. In that scenario construction of new biodigesters would last around one year.
- The Calera Farma counts with all authorisations to develop new biodigesters.
- Feasibility studies are pending however the Calera farm has all the required know-how since has in operation to biodigesters.

Estimated Emission Reductions

Annual: to be determined

- Up to and including 2012: to be determined
- Up to a period of 10 years: to be determined
- Up to a period of 7 years: to be determined
- Up to a period of 14 years: to be determined

Project Benefits

- In the social fields, the project gives work to 5 new workers, buses for personnel transport and new lunch places for the total workers of the farm.
- The main economic effect is the reduction in the costs of the production of eggs by reducing the amount of gas to buy, obtaining a lower retail price which benefits million of people in the country.
- Because the cost of implementation of biodigesters is too high, La Calera is the only Peruvian farm using this method of producing gas to burn the heaters This project as well has been seen as a precedent in the country in environmental issues and it is commented and applause by local institutions being used as an example of what can be done in similar industries.
- As an extra output, the solid residual that comes out of the digester at the end of the process is used as top of the line fertilizer. It is being used inside the farm.

Project Participant and Financing

Total project cost estimate:

- Machinery and equipment: ---
- Working Capital: ---
- Total project costs: US\$ 400,000

Sources of finance to be sought or already identified:

- Equity: ---
- Debt : ---
- Carbon finance contribution sought: As much as we can have in advance.

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"Tarucani" Hydropower Project

The Project "Tarucani" consists of a run-of-river power plant, it is installed capacity and estimated yearly average generation is 49 MW and 282,5 GWh, respectively. It will be located in Peru, in the south-western department of Arequipa, in the district of Huambo in the province of Caylloma. The region is scarce of vegetation including small agriculture. The project will be connected to the SEIN through a 91,5 km. transmission line to the Cerro Verde Substation. The project is expected to displace 153.957 tons of carbon dioxide equivalent ("tCO₂e") per year, which accounts for 1.077.699 tCO₂e for the first crediting period (7 years).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

"Tarucani" project will displace GHG emitted by thermal power plants using diesel, residual (bunker), carbon and natural gas as fuel from the national grid.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermolectric plants with natural gas in combined cycle plants replacing most of the other plants with oil, of all types fuels. Tarucani project will displace part of this energy.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

"According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance business in a study done in December 2004 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that "Tarucani" project will displace around 153.957 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The construction of the project is planned to begin on april 2006. The operation is assumed to start in april 2008.

Estimate of time required before becoming operational

2 years

What is the project lifetime?

40 years

Current status or phase of the project eg: which of the following phases have been completed:

- The feasibility study is finished and is available
- The bidding has been already made for the different works
- The concession contract with the government is signed - R. S. N° 125-2001-EM
- The environmental impact studies are approved - R. S. N° 125-2001-EM
- The concession for the water use is available
- Energy concession is available
- Financing negotiations are not closed
- The project has the letter of approval from the DNA

Estimated Emission Reductions

Annual: Since 2008 an average of 153.957 tCO₂e

- Up to and including 2012: 769.785 tCO₂e
- Up to a period of 10 years: 1.539.570 tCO₂e
- Up to a period of 7 years: 1.077.699 tCO₂e
- Up to a period of 14 years: 2.155.398 tCO₂e

Project Benefits

- The hydroelectric would provide energy to the Querque Farmer Community composed by 200 poor families. In addition, the project would provide the following services to this community: Domestic water supply and sewage, construction of an elementary school, a medical center and a landfill.
- This electricity would allow this rural community to improve and diversify their economic activities. Also the construction of an access road to the hydroelectric plant would connect the community to the main road. The construction of the road is planned to respect the borders of the land property.
- Improving the access for water to the livestock.

Project Participant and Financing

Total project cost estimate:

- Civil Works: US\$ 25,3 MM
- Machinery and equipment: US\$ 17,3 MM
- Transmission lines: US\$ 5,8 MM
- Other costs: US\$ 3,5 MM
- Total project costs: US\$ 52,0 MM

Sources of finance to be sought or already identified:

- Equity: 30 to 40%
- Debt : 70 to 60%
- Carbon finance contribution sought: As much as we can have in advance.

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Carhuaquero 4 Hydroelectric Power Plant

The Project is a small run-of-river hydroelectric power plant, located adjacent current Carhuaquero hydro power plant in Cajamarca- Perú and using water of the Chancay River. The Purpose of The Project is renewable electricity generation for the National Electric Grid (SEIN). The Project installed capacity and projected yearly average generation is 9,8 MW and 42 GWh per year, respectively. The Project is expected to displace approximately 169.638 tCO₂e for the first crediting period (7 years), generating the equivalent amount of Certified Emission Reductions (CERs).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

"Carhuaquero 4 Hydro Plant" project is a small CDM project that will displace from the national grid, some thermal power plants that use diesel, residual (bunker), coal or natural gas as fuel, reducing in these way CO₂ emissions.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric plants (Gas Turbines) with natural gas in Single and Combined Cycle plants replacing most of the other plants with other plants with oils, of all types. The project will assist the National Grid to keep thermal plants shut and use them only as stand-by power generation, therefore, displacing expensive heavy fuel oil, diesel, coal and gas fired generation and at the same time; reducing CO₂ emissions to the atmosphere by generating energy without GHG emissions.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the most recent version of Appendix B to the simplified M&P for small-scale CDM project activities ("Appendix B"), the type and category of the project activity for The Project is: Type I: Renewable Energy Project . Category D: Renewable electricity generation for a grid. The World Bank Carbon Finance Business applied this methodology to Peru and got a baseline emission factor of 577 tCO₂/GWh. Therefore, the project of Carhuaquero 4 will displace approximately 24.234 ton CO₂ each/year, which otherwise will be emitted by thermal power plants of the national grid.

Current Status

Earliest project start date

The Basic engineering and bid documents preparation are in process. The bidding for generation equipment supply and civil construction has been during November 2005. The generation equipment supply was awarded in March to European company and the civil construction is expected to be awarded by June 2006. The construction is scheduled for 17 months; therefore The Project starting date is expected to be on September 2007.

Estimate of time required before becoming operational

Since may, seventeen (17) months. The Project starting date is expected to be on september 2007.

What is the project lifetime?

More than 40 years

Current status or phase of the project

- Water permit formalization in process
- Authorization by Energy and Mines Ministry is in process
- Financing (own resources) is approved by our corporation
- Bidding documents for construction in progress

Estimated Emission Reductions

Annual: Since 2007 an average of 24.234 tCO₂e

- Up to and including 2012: 121.170 tCO₂e
- Up to a period of 10 years: 242.340 tCO₂e
- Up to a period of 7 years: 169.638 tCO₂e
- Up to a period of 14 years: 339.276 tCO₂e

Project Benefits

- Project would support and improve the regional electric supply because the new energy generation would give more reliability and quality to the electric system in 22,9 kV and 138 Kv.
- The project would contribute to sustainable development in rural areas.
- The project fulfills the environmental standards in Peru, local people would support it development.
- Increase possibilities for rural electrification around The Project Site.
- During construction the project will generate local jobs and more economic activity in surrounding towns such as La Ramada, Chongoyape and others.
- Serve as a small demonstrative project for clean renewable energy generation in the country.

Project Participant and Financing

Total project cost estimate:

- Development cost: US\$ 300.000
- EPC Cost: US\$ 5.000.000
- Engineering and Management: US\$ 400.000
- Other costs: US\$ 300.000
- Total Investment: US\$ 6.000.000

Sources of finance to be sought or already identified:

- Financial mainly will be provided by the internal resources of Duke Co.
- Carbon finance contribution sought: We are looking for the best deal.

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"138 Kv Transmission Line Majes - Camana" Project

The area of the 138 Kv TL Majes - Camana Project of Sociedad Electrica del Sur Oeste S. A. is located at the south part of Peru, comprehends the Camana province, coast region of the department of Arequipa (1.430-70 meters above sea level). The project extends 65,58 km of the 138 Kv transmission line, from Majes to Camana, constructs 1 substation, and supplies electrical energy to the Camana province. The thermal power plants of Camana consume approx. 72.000 gallons of diesel oil per month (generate 10,76 Gwh per year). The interconnection to SEIN (Sistema Interconectado Nacional) allows removing approx. 2.754,56 CO2 tons per year, generating the equivalent amount of Certified Emissions Reductions (discounting the emission factor of SEIN).

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

The Majes - Camana Transmission Line will displace GHG emitted by the thermal power plants in Camana, which use approx. 72.000 gallons of diesel oil per month, replacing this generation with energy from the SEIN system.

What would the future look like without the proposed CDM project?

In the absence of the project, the energy supply in Camana province will continue to be provided by thermal power generators, which implies high levels of GHG emissions, and continue increasing costs of electricity generation for enterprises and final users, and the use of private thermal power generators will increase.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, in a preliminary study of the World Bank Carbon Finance Business, at the beginning of 2005, an Emission factor of 0,8 tCOe/gwh was obtained for the diesel generators, and 0,544 for energy of the SEIN. Using these factors, it is expected that the Majes - Camana Transmission Line will displace near 2.754,56 tCOe/year (which otherwise will be emitted with thermal power using diesel oil).

Current Status

Earliest project start date

Currently the construction of the project is in its initial phase. It has already started in march 2006 and will be finished in november 2006.

Estimate of time required before becoming operational

9 months

What is the project lifetime?

30 years

Current status or phase of the project

- Definitive Concession - Transmission of Electrical Energy - In process of approval by the Ministry of Energy and Mines.
- Environmental Impact Study approved by The Ministry of Energy and Mines and the National Institute for Natural Resources (INRENA).
- Rights of Way, obtained and approved.
- Feasibility and Detailed Engineering Studies Completed.
- Financing of the Project - Approved and proceeding.
- Project now in the construction Stage.

Estimated Emission Reductions

Annual: an average of 2.754,56 tCO2e

- Up to and including 2012: 16.527,36 CO2e
- Up to a period of 10 years: 27.545,60 tCO2e
- Up to a period of 7 years: 19.281,92 tCO2e
- Up to a period of 14 years: 38.563,84 tCO2e

Project Benefits

- Improvement of the company's image, working with rice mills that now generate electricity with diesel oil.
- Use of high quality and cheap energy, promoting an efficient natural resources development of the Camana province, improving the quality of life and productive economy.
- Electrification of the province will create new sources of employment.
- Reduction of 40% in the rates for the users, which will allow a better development of agricultural industry.
- The electrical frontier will be amplified.
- The Majes - Camana TL is being constructed under international environmental standards and has received the approval of the Ministry of Energy and Mines (MEM) and the Natural Resources Institute (INRENA).
- The construction of the project will allow the interconnection of new localities and enterprises that still use thermal power generation, with estimated emission reductions of 2.754,56 gallons of diesel oil per year.
- In the near future, the construction of another Transmission Line will attend new localities, such as Ocoña, Atico, Caraveli, as well as auto power generating enterprises.

Project Participant and Financing

Total project cost estimate:

- Installed cost: US\$ 3.006.559,10
- Direction: US\$ 167.687,44
- Equipment: US\$ 301.372,46
- Total project cost: US\$ 3.475.619,00

Sources of finance to be sought or already identified:

- Financing of the project is by own resources of Sociedad Electrica del Sur Oeste S. A.

Contact Information:

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CDM in Peru

Good business with Sustainable Development



"Sopladera" Wind Energy Project

EGESUR is an electric generation company that operates hydroelectric power plants in the south andean region of Peru. The project is a small scale Wind Energy Project. Wind measurements in Sopladera, southern coast of Peru, indicate a stable wind regime. The project installed capacity would be 10 MW, and it would be connected to the National Electric Grid (SEIN). The project is expected to displace 16.450,56 tCO₂e per year.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

"Sopladera" project is a small scale project that will displace, from the national grid, some thermal power plants that use diesel, residual (bunker), coal and natural gas as fuel, reducing CO₂ emissions.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermoelectric plants (Gas Turbines) with natural gas in single and combined cycle plants replacing other plants with fossil fuels. The project will assist the National Grid to keep thermal plants shut and use them only as stand by power generation, therefore, displacing expensive fuel diesel, coal and gas fired generation and at the same time, reducing CO₂ emissions.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

"Sopladera" will displace more than 16.450,56 tCO₂e/year which otherwise will be emitted by thermal power plants with diesel, residual (bunker), carbon and natural gas. The conditions of the site and the wind regime offer the possibility to increase the project capacity up to 20 MW.

Current Status

Earliest project start date

The construction of the project is planned to begin on the second semester of 2007. The operation is assumed to start in mid 2008.

Estimate of time required before becoming operational

2 years

What is the project lifetime?

20 years

Current status or phase of the project eg: which of the following phases have been completed:

- Pre-Feasibility Study finished
- Wind measurements at project's site

Estimated Emission Reductions

Annual: an average of 16.450,56 tCO₂e

- Up to and including 2012: 82.252,80 tCO₂e
- A period of 10 years: 164.505,60 tCO₂e
- Up to a period of 7 years: 115.153,90 tCO₂e
- Up to a period of 14 years: 230.307,80 tCO₂e

Project Benefits

Peru's energy generation depends highly on hydro power and thermo electrical power. Due to climate changes the first is assumed to decrease within the next years. The project will be the one of the firsts wind energy project in Peru, diversifying the energy generation of the country. Almost 90% of the Peruvian coast is a deserted land, with an excellent wind regime. The project is assumed to have a key function for the future development of renewable energy projects in Peru.

Project Participant and Financing

Total project cost estimate:

- Development and Engineering Costs: US\$ 600.000
- Direct costs of generation equipment: US\$ 10.400.000
- Direct costs of transmission equipment: US\$ 1.200.000
- Miscellaneous costs: US\$ 200.000
- Total costs: US\$ 12.400.400

Sources of finance to be sought or already identified:

- Equity: 4,8%
- Debt: 95,2%
- Carbon finance contribution sought: As much as we can have in advance.

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CDM in Peru

Good business with Sustainable Development



"Aricota 3" Hydropower Project

EGESUR is an electric generation company that operates two hydroelectric generating facilities in the south Andean region of Peru. This run of the river project will be built upstream of the existing Aricota 2 hydro power plant and using its water discharged that corresponds to the Curibaya river basin. The purpose of the project is the generation of renewable energy for the National Electric Grid (SEIN). The project plans to have an installed capacity of 19 MW and an estimated annual energy production of 52,5 GWh.

Baseline Scenario

Which emissions are the proposed Clean Development Mechanism CDM project displacing?

The project will displace GHG emitted by thermal power plants using diesel, residual (bunker), carbon and natural gas as fuel from the national grid.

What would the future look like without the proposed CDM project?

The new additions in the future to the grid basically will be thermolectric production with natural gas in single and combined cycle plants replacing most of the other plants with other plants with oils, of all types. National Policies, sectoral policies, and the new natural gas exploitation "Camisea" particular circumstances foster thermal technology against hydro-developments.

What would the estimated total greenhouse gas (GHG) reduction be with the project?

According to the Consolidated Methodology ACM0002, the World Bank Carbon Finance Business in a study done in December 2005 got a Baseline Emission Factor of 544 tCO₂e/gwh. Using that emission factor it is expected that "Aricota 3" project will displace around 28.560 tCO₂e/year which otherwise will be emitted by thermal power with diesel, residual (bunker), coal and natural gas.

Current Status

Earliest project start date

The preliminary design was complete (available). The final design & feasibility will be finished in december 2006.

Estimate of time required before becoming operational

We plan to complete the project in mid 2010.

What is the project lifetime?

50 years

Current status or phase of the project eg: which of the following phases have been completed:

- Feasibility study finished (available).
- The environmental and archaeological impact studies have been done.
- The concession for the water use was given by the Ministry of Agriculture.
- A permanent and definite Energy Concession was approved under Supreme Resolution.

Estimated Emission Reductions

Annual: an average of 28.560 tCO₂e

- Up to and including 2012: 57.120 tCO₂e
- Up to a period of 10 years: 285.560 tCO₂e
- Up to a period of 7 years: 199.920 tCO₂e
- Up to a period of 14 years: 399.840 tCO₂e

Project Benefits

- The hydroelectric plant will use the water resources available from the Laguna Aricota, producing cheap energy with low environmental impact comparing with the electricity generated from thermal plants.
- Generation of Hydro-electricity would allow displacing or shutting down a carbon power thermal plant and would also allow rural communities the improvement their economic and production activities.
- The project would create new jobs, develop the surroundings and in general would contribute to the economic growth to a big portion of the country by supplying more energy through the interconnection of the project to the national grid.

Project Participant and Financing

Total project cost estimate:

- Development cost: US\$ 600.000
- Installed cost: US\$ 19.300.000
- Other Cost: US\$ 500.000
- Total project costs: US\$ 20.400.000

Sources of finance to be sought or already identified:

- Equity: 5,4%
- Debt: 94,6%
- Carbon finance contribution sought: As much as we can have in advance.

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