GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

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November 19, 2013

Dear Council Member:

UNIDO as the Implementing Agency for the project entitled: ***Uruguay: Towards a Green Economy in Uruguay: Stimulating Sustainable Production Practices and Low-emission Technologies in Prioritized Sectors***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNIDO procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by Council in June 2012 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by UNIDO satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.TheGEF.org. If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

Naoko Ishii
CEO and Chairperson

Attachment: GEFSEC Project Review Document
Copy to: Country Operational Focal Point, GEF Agencies, STAP, Trustee

REQUEST FOR CEO ENDORSEMENT

PROJECT TYPE: FULL-SIZED PROJECT
TYPE OF TRUST FUND: GEF TRUST FUND

For more information about GEF, visit TheGEF.org

PART I: PROJECT INFORMATION

Project Title: Towards a green economy in Uruguay: stimulating sustainable production practices and low-emission technologies in prioritized sectors.			
Country(ies):	Uruguay	GEF Project ID:[1]	4890
GEF Agency(ies):	UNIDO	GEF Agency Project ID:	120323
Other Executing Partner(s):	Ministry of Industry, Energy and Mining (MIEM), Ministry of Housing, Territorial Planning and Environment (MVOTMA) and Ministry of Agriculture, Livestock and Fishery (MGAP)	Submission Date:	10/16/2013
GEF Focal Area (s):	Climate Change	Project Duration(Months)	48
Name of Parent Program (if applicable): ➢ For SFM/REDD+ ☐ ➢ For SGP ☐ ➢ For PPP ☐	N/A	Project Agency Fee ($):	339,273

A. FOCAL AREA STRATEGY FRAMEWORK[2]

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount ($)	Cofinancing ($)
CCM-1	Technologies successfully demonstrated, deployed, and transferred	1.1: Innovative low-carbon technologies demonstrated and deployed on the ground	GEF TF	509,477	608,115
CCM-1	Enabling policy environment and mechanisms created for technology transfer	1.2: National strategies for the deployment and commercialization of innovative low-carbon technologies adopted		498,973	478,692
CCM-3	Favourable policy and regulatory environment created for renewable energy investments	3.1: Renewable energy policy and regulation in place	GEF TF	519,695	618,193
CCM-3	Investment in renewable energy technologies increased	3.2: Renewable energy capacity installed 3.3: Electricity and heat produced from renewable sources		1,864,582	30,705,000
		Total project costs		3,392,727	32,410,000

[1] Project ID number will be assigned by GEFSEC.
[2] Refer to the Focal Area Results Framework and LDCF/SCCF Framework when completing Table A.

B. PROJECT FRAMEWORK

Project Objective: Transform the different kinds of waste generated in the agriculture and the agro-industry production chains in Uruguay into various types of energy and/or other byproducts with the aim of reducing GHG emissions, while contributing to the development of a low carbon sustainable production model supported by an adequate technology development and transfer.

Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Grant Amount ($)	Confirmed Cofinancing ($)
1. Policy and regulatory framework strengthening	TA	1. The policy framework to promote sustainable production schemes and implement low-emission technologies in prioritised sectors (agricultural and farming sector, processing industries, small communities) has been strengthened.	1.1 Establishment of a taskforce coordinated by DNE/DINAMA/MGAP[3] responsible for preparing strategies in the targeted sectors. 1.2 Studies carried out as inputs for enhancing policy instruments covering at least 10 fields; amongst others, these include: i) biogas production and uses of biogas; ii) production of synthetic diesel from organic matter; iii) use of dry manure for combustion; iv) production and application of biofertilizers to the soil. 1.3 Development and implementation of an action plan to remove financial barriers and provide applicable mechanisms and instruments to favour the inclusion and adoption of new low-carbon waste valorisation technologies in the targeted sectors. 1.4 Identification and design of financial instrument(s) targeting low carbon technologies for waste valorisation and identification of local financial institutions (e.g. banks) that will	GEF TF	494,727	495,000

[3] DNE: Dirección Nacional de Energía (National Energy Directorate), DINAMA: Dirección Nacional de Medio Ambiente (National Directorate for the Environment), MGAP: Ministerio de Ganadería, Agricultura y Pesca (Ministry of Agriculture, Livestock and Fishery).

			implement the scale up of the technologies after this project is completed. 1.5 Development of new policy / regulation draft or revision of existing policy / regulation based on the pre-identified areas.			
2. Knowledge base (technological capacities) in the fields of waste-to-energy, waste valorisation and low emission waste treatment technologies strengthened	TA	2. The design and implementation of waste-to-energy valorisation alternatives and low-emission waste treatment technologies have been enhanced due to an improved knowledge base.	2.1 Disaggregated (department level) physical and chemical characterisation of at least the 16 identified waste streams with valorisation potential. 2.2 Research and prefeasibility studies (including social, environmental and economic dimensions) conducted in the targeted sectors to determine the most viable waste valorisation processes and business models.	GEF TF	395,000	415,000
3. Demonstration of waste valorisation and renewable energy technologies' applications	INV	3. Waste-to-energy and other feasible waste valorisation applications have been adopted in the targeted sectors.	3.1 Four fully functional large-scale waste treatment undertakings commissioned (digestion of vinasse from bioethanol production, digestion of cow manure from dairy sector, co-digestion of combined waste feedstock in agro-industry and waste treatment and management project in small size cattle breeding farms). 3.2 Call for Proposals for and implementation of at least five small to medium scale projects, including (i) design of the call; (ii) feasibility and technical design studies for demonstrations in medium and small sized farms / industries in the	GEF TF	1,665,000	30,525,000

			targeted sectors; and (iii) implementation of at least five full-scale projects in medium and small sized agro-industries.			
	TA		3.3 Identification of a portfolio of potential waste valorisation projects. 3.4 Training of personnel on the operation of at least the four large-scale waste treatment undertakings.	GEF TF	110,000	180,000
4. Capacity building, training and dissemination campaign for the adoption of low carbon waste valorisation initiatives	TA	4. The capacities of sector agents to deliver state-of-the-art sustainable production schemes through sustainable waste management and low-emission treatment technologies in prioritized sectors have been strengthened.	4.1 A running web-based knowledge mangement platform has been set up. 4.2 Creation of at least (i) 2 toolkits and (ii) 2 training courses (including train-the-trainer): (i) Toolkit on identification of waste valorisation project opportunities and technological options, and toolkit on financing waste valorisation opportunities and applying successful business models; and (ii) Training course on identification of waste valorisation project opportunities and technological options, and training course on financing waste valorisation opportunities. 4.3 Establishment of a network between different productive sectors to ensure the sustainability of the knowledge management platform after the project is completed. 4.4 Dissemination campaign and a dissemination workshop to promote waste-to-	GEF TF	475,000	475,000

			energy, waste valorisation and low-emission waste treatment activities and to increase their adoption by farmers, industries and communities. 4.5 Generation of knowledge about the waste valorisation field through the collaboration with universities.			
5. Monitoring and evaluation	TA	5. A monitoring plan has been prepared and implemented.	5.1 A monitoring plan has been designed and agreed upon during the Project's inception phase. 5.2 Project progress on defined indicators and compliance with UNIDO and GEF guidelines (including gender) is being monitored. 5.3 A mid-term evaluation and terminal evaluation have been conducted.	GEF TF	90,000	70,000
			Subtotal		3,229,727	32,160,000
			Project management Cost (PMC)[4]	GEF TF	163,000	250,000
			Total project costs		3,392,727	32,410,000

C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)

Please include letters confirming cofinancing for the project with this form

Sources of Co-financing	Name of Co-financier (source)	Type of Cofinancing	Cofinancing Amount ($)
National Government	MIEM	In-kind	1,299,811
National Government	MVOTMA	In-kind	272,500
National Government	MGAP	In-kind	272,500
National Government	Instituto Nacional de Colonizacion	Cash	13,055,189
Private Sector	Alcoholes del Uruguay S.A. (ALUR S.A.)	Cash	7,400,000
Private Sector	Estancias del Lago	Investment	10,000,000
GEF Agency	UNIDO	Cash	60,000
GEF Agency	UNIDO	In-kind	50,000
Total Co-financing			32,410,000

[4] PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

GEF Agency	Type of Trust Fund	Focal Area	Country Name/ Global	(in $)		
				Grant Amount (a)	Agency Fee (b)[2]	Total c=a+b
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total Grant Resources				0	0	0

[1] In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

[2] Indicate fees related to this project.

F. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Grant Amount ($)	Cofinancing ($)	Project Total ($)
International Consultants	474,230	138,500	612,730
National/Local Consultants	678,500	851,500	1,530,000

G. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? Not with the GEF Trust Fund.

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund).

The Government of Uruguay (GoU) has solid previous experience in implementing financial instruments in relation to GEF projects, which are the *Energy Efficiency Trust* (FEE) and the *Uruguayan Savings and Energy Efficiency Trust* (FUDAEE) (further information can be found in Section A. 5. of this document). It is therefore the desire of the national counterparts to not apply a non-grant instrument during this project, but to design and structure a financial instrument (most likely a revolving fund) that will start operating after project closure. The procedure for capital rising will be decided during project execution, based on the country's previous experience in projects of this sort. Moreover, based on the GoU's experience with the establishment of financial instruments plus the lessons learnt from the mentioned GEF projects, it is envisaged that the GoU will successfully make available the necessary financial resources that will support the development and up-scaling of new waste valorization projects that will result from Project Component #3.

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF[5]

A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.

The proposed Project supports the following legislation and high-level policy of the Government of Uruguay:

(a) the General Law for the Protection of the Environment ("LGPA") No. 17.283 (2000) by contributing to environmental protection through the improvement of air, water and soil quality, which is achieved due to the implementation of new technologies for waste treatment, management and valorisation. In particular, air quality is improved as GHG emissions and other air pollutants are reduced or avoided. The Act specifically addresses climate change in its Article #19, by entitling the Ministry of Environment to establish mitigation and adaptation actions. Renewable energy generation and waste valorisation technologies can be considered mitigation actions. The Act also addresses waste issues in its Article #21, entitling the Ministry of Environment to dictate the provisions and measures to regulate waste management activities. The Project will actively promote waste valorisation thus reducing the amount of waste disposed in landfills and the demand for raw

[5] For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter "NA" after the respective question

materials, in turn, reducing the pressure on lands and ecosystems. Furthermore, wastewater treatment technologies shall apply collection, storage and treatment systems (pits, reactors, tanks, etc.) specially designed to avoid leaks that may pollute the soil or nearby water bodies and underground watercourses;

(b) the National Plan for Responding to Climate Change (2010) (http://www.cambioclimatico.gub.uy/): amongst the objectives that this Plan has, more than half of them are clearly supported by the proposed project:

- to coordinate actions at national level to respond to climate change
- introduce mitigation and adaptation strategies within productive sectors
- promote mitigation activities by means of technology transfer, promoting investment and access to carbon markets
- foster stakeholders' involvement through education, capacity building and awareness raising actions

Moreover, the Plan establishes lines of action that are supported by this project, including the use of at least 30% of the agro-industrial wastes to generate energy.

With regards to mitigation actions, agriculture is regarded amongst the main sectors of interest that hold great GHG mitigation potential.

(c) the National Greenhouse Gas Inventory (2004) and the Third National Communication to the COP of the UNFCCC (2010): both describe the emissions scenario of the country per sector and per greenhouse gas. Methane emissions are in first place, which mostly come from agricultural activities. Nitrous oxide emissions are generated in this sector too, mainly from animal manure and from soils. Municipal solid waste is another source of nitrous oxide emissions as well as methane emissions. According to the 2004 inventory, methane emissions have been increasing since 1990. As stated in the 2004 inventory, CH_4 emissions from agriculture (enteric fermentation, manure management, rice crops, agricultural soils, burning of savannahs and crops waste burning on the fields) were 821 ktonCH$_4$, and those from solid waste and wastewater treatment were 64 ktonCH$_4$. These add up 885 ktonCH$_4$ which is equivalent to 18,585 ktonCO$_2$e for the year 2004. With regards to CO_2, Uruguay has offset its CO_2 emissions generated in the energy and industrial sectors during the year 2004 via reforestation activities that led to the removal of thousands of tons of that greenhouse gas.

(d) the Fourth National Communication to the COP, that Uruguay is currently developing and which will include the GHG inventories for the years 2006, 2008, 2010, 2012 as well as a national GHG inventories system and national measures for climate change mitigation.

(e) the National Energy Plan 2008-2030: As part of its new approach towards a green economy, Uruguay has defined in 2008 a National Energy Policy ("Uruguay 2030"). In 2010, this long term energy policy was approved by a Special Committee including all political parties represented in the Uruguayan Parliament. It is based on 4 strategic pillars, short, medium and long-term goals and many lines of action. One of the strategic pillars aims at the diversification of the energy mix, increasing the share of renewable energies. One of the most relevant short-term goals of the policy is to reach 50% of renewables in the global primary energy mix of the country by 2015. Many lines of action were launched in order to reach these and other goals. The introduction of wind and forest biomass energy has received assistance from the GEF through the United Nations Development Programme (UNDP). Wind projects comprise 52 MW (generating plants). Wind projects for 780 MW have already signed a PPA contract with the national public service utility UTE, there is an open bid for 71 MW and there are also other projects for 230 MW, some of which were done by UTE in conjunction with Eletrobras. Eight biomass power or cogeneration projects with a total capacity of 170 MW are already running and another 2 biomass projects have already signed a PPA contract with UTE. The fuel used in these biomass plants is mainly forestry waste, black liquor, rice husk and sugarcane bagasse. Unlike wind and biomass and despite the large amount of different kinds of waste in Uruguay's production chains, energy generation from other agriculture and agro-industrial waste is almost unexploited. The goal of the National Energy Policy states that, in the short-term, at least 30% of the total waste in the country shall be transformed into different types of end-use energy (electricity, heat, biofuels). Considering only biogas production, a preliminary power generation estimate is of the order of 18 MW[6]. This represents 5% of the mean total power demand in Uruguay (the total

[6] Based on the estimation carried out during the PPG phase. Please see Annex J for further details.

electricity demand in 2010 was 9,550 GWh). This amount is significant from an energy policy perspective and demands further exploration.

(f) the National Action Plan for Environmentally Sustainable Production and Consumption 2010-2015 (2010): the present project specifically involves sectors that relate to the strategies T-2 "Promote efficient use of energy and diversification of the energy matrix" and T-5 "Environmentally appropriate management of residues and waste flows" of the Plan.

(g) the National Industrial Waste Management Bill that Uruguay is currently developing and the Atmospheric Emissions Reduction Bill.

(h) the six NAMAs, which Uruguay, through its focal point (Ministry of Housing and Environment), has submitted to the UNFCCC (http://unfccc.int/cooperation_support/nama/items/6945.php):

- Two are requesting recognition: i) Promotion of renewable energy participation in the Uruguayan primary energy mix; ii) LNG Terminal with regasification capacity of 10,000,000 m^3/d of natural gas with possible expansion to 15,000,000m^3/d.
- Three are seeking support for their preparation: i) Sustainable production with low-emission technologies in agriculture and agro-industry production chains; ii) Sustainable Housing Programme; iii) High Integration Program of Wind Energy.
- One is seeking support for implementation: First introduction of Photovoltaic Solar Energy in the national electrical grid

There is one NAMA submitted to the UNFCCC which is requesting registration to receive financial support (grant) which will be used for the acquisition of machinery and the development of laboratory research. The NAMA is focused on the sustainable production with low-emission technologies in the agriculture and agro-industry production chains. The NAMA complement the present project as it has a similar objective.

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities

The Project to be developed in Uruguay is consistent with CCM-1 Objectives (Promote the demonstration, deployment, and transfer of innovative low-carbon technologies) and CCM-3 Objectives (Promote investment in renewable energy technologies) of the GEF-5 Results Framework. The following paragraphs provide information on how the CCM objectives are pursued by the project:

Objective CCM-1 is pursued by (i) transferring advanced technological solutions to improve environmentally sound technologies in the targeted sectors and the adaptation thereof to local conditions; (ii) demonstrating the technical feasibility of transforming waste to energy and other forms of waste valorisation in the Uruguayan prioritized sectors (agricultural and farming sector, processing industries and small communities), reducing the amount of waste disposal on the land and landfilled; (iii) demonstrating selected, low-emission waste treatment technologies - including the capture and use of biogas for energy purposes - in a number of full-scale enterprises in collaboration with private partners; and (iv) strengthening the policy and regulatory framework to promote the implementation of environmentally sound technologies, use of renewable energy technology, valorisation of waste and low-emission waste treatment for increasing market penetration of low-emission technologies.

Objective CCM-3 is pursued through (i) strengthening the policy framework and establishing appropriate incentives for energy generation from agricultural and agro-industry wastes; and (ii) mobilizing direct and indirect investment to actively promote investment in relevant waste-to-energy technologies. Important GHG mitigation effects are expected compared to the baseline situation.

The Project will directly contribute to the core outputs of the GEF-5 Results Framework "Technologies successfully demonstrated, deployed, and transferred", and "Enabling policy environment and mechanisms created for technology transfer" as well as "Investment in renewable energy technologies increased", and "GHG emissions avoided". The Project will also review the existing regulatory framework for energy generation from agricultural and agro-industry waste and as such, deploy activities aligned with the output "Favourable policy and regulatory environment created for renewable energy investments".

A.3. The GEF Agency's comparative advantage

Since its establishment, UNIDO has built up a long track record assisting countries to implement industrial support programmes. UNIDO's Energy and Climate Change Division pursues the integration of reduced carbon objectives into industrial development policies and activities. The GEF Council document specifically highlights UNIDO's comparative advantage in capacity building and technical assistance, which are key components of the proposed project.

More specifically, UNIDO has been implementing since 2008 the regional programme 'Observatory for Renewable Energy in Latin America and the Caribbean', which aims at establishing bridges inside and outside the LAC region to share good practices and increase the presence of renewable energy technologies. The GEF project described here will benefit from the sharing of experiences and networking opportunities with other UNIDO projects focusing on biogas applications and waste valorization in agro-industries such as in Chile and Pakistan. Moreover, the proposed Project will also benefit from synergies with Brazil's first biogas laboratory, which was launched at Itaipu-Brazil in mid-2012. UNIDO has widespread experience to interact with stakeholders from the private sector and public sector as well as NGOs. The proposed GEF initiative draws on UNIDO's experience by strengthening the competitiveness of local industries and by introducing renewable energy technologies. The proposed activities range from demonstration and institution building to policy support, involving a broad range of stakeholders. UNIDO is well-placed to implement this Project because of its experience and expertise in renewable energy projects in a variety of technologies (including small-scale hydro, solar, wind, biomass and biogas), its long history of cooperation with key stakeholders, and its high standards of fiduciary responsibility.

A.4. The baseline project and the problem that it seeks to address

The following text describes the country background, the baseline project, the barriers and the problem addressed.

Background:

Uruguay is one of the smallest countries in South America in terms of land surface, with a solid economic, political, social and cultural background. The Uruguayan economy is growing very fast: 6.5% GDP mean annual growth in the last 7 consecutive years. Agriculture has been and is a major contributor to the economy[7]. The warm, humid climate and the abundance of grasslands and arable soils create adequate conditions for agriculture and silviculture, as they provide natural pastures for cattle and sheep breeding. With a population of approximately 3.3 million people and an area of 176,215 km^2 Uruguay produces large surpluses of meat, dairy products, agricultural products, wood, leather and wool. There are more than 32,000 cattle farms in the country with a total stock of over 11 million bovines and 7.4 million sheep. The large majority (near 80%) are family-run cattle farms. Large establishments (over 1,250 ha) comprise 8.6% but represent more than 50% in terms of land area and animals (2000). The number of dairy farms is much smaller (in the order of 4,500), with an average of 59 dairy cows occupying 189 ha (2007)[8].

In a sparsely populated country like Uruguay, waste and residues from traditional activities in the primary sector were not of major concern in the past decades. The often severe environmental impacts of processing industries were not recognized until late. Residues from agriculture and agribusiness facilities, such as sawdust, rice husk, and cow manure were commonly piled up or disposed of on the land. Bagasse is burned as a common practice. Non-appropriately treated liquid manure (wastewater) is in some cases discharged into streams and rivers The government has established a National Action Plan for Environmentally Sustainable Production and Consumption (2010-2015), which also tackles the environmentally appropriate management of residues and waste flows including the dairy and meat sectors.

As a result of the insertion of Uruguay into the global markets and the inflow of foreign capital, the primary sector is undergoing a process of intensification, up-scaling and concentration of activities. Integrated cattle farms (the so-called "feedlots"), and dairy factories and milking yards (the so-called "tambos") may count thousands of animals bound to a small area. Manure is removed in liquid form and must be treated, which is usually done in open lagoons, causing methane emissions from natural anaerobic digestion. Regulation requires wastewater to be treated before discharge. Some agribusiness (the largest ones) follow a proactive approach, anticipating more stringent legislation in the future

[7] Agriculture accounted for 10.1% of GDP in 2011. Source: "Uruguay at a Glance", World Bank / Development Economics LDB Database, 17 March 2013. Available at: http://devdata.worldbank.org/AAG/ury_aag.pdf

[8] Source: Cadenas de Valor (I), Gabinete Productivo Etapa 2, Fase I, Presidencia de Uruguay. August 2008.

but also pursuing cleaner production practices as a business strategy. Other companies adhere to the mandatory requirements, since investments in environmental measures are considered financially unrewarding.

The large majority of small farm holders in Uruguay are not generally aware enough of the most important environmental issues related to their business. Given their limited investment capacity and the lack of readily available solutions for waste valorisation, the government expects coercive regulation to have a limited effect.

With regards to urban solid waste management in Uruguay, the first experience of biogas production from urban solid waste was gained through the 1 MW demonstration project at Las Rosas, in Maldonado, where landfill gas is captured and used to generate electricity. However, the small size of the majority of the cities all over the country (excluding the Montevideo area) calls for the consideration of other solutions based on the synergy that could be created with other projects. In terms of climate change issues, the expected benefits of reducing urban solid waste are the reduction of greenhouse gas emissions, mostly methane, together with the improvement of water and soil quality due to the adoption of more efficient waste valorisation methods.

Baseline project:

The baseline project would consist of the continuation of the current activities that the country is undertaking in the field of GHG mitigation with specific emphasis on the primary production sectors (poultry, swine, feedlots, slaughterhouses, etc.).

The recently approved IADB/MIF (Inter-American Development Bank/Multilateral Investment Fund) project is intended to increase the efficiency of energy used by 500 dairy farmers of a cooperative. By reducing overall energy consumption, and promoting the integration of renewable sources, there will be contributions to the profitability and sustainability of primary production of milk as well as to the environment by means of generating reductions in CO_2 emissions. To achieve this, access to technical expertise and support to develop innovative ways to access the financing of investments needed for this group of rural MSMEs will be provided. The project will generate technical capabilities within the country. The emphasis on learning and information gathering will help to expand the benefits in the entire dairy industry and agriculture in Uruguay and the region[9].

On a regulatory and policy level, several relevant national plans have been conceived such as the National Plan for Responding to Climate Change 2010, the National Action Plan for Environmentally Sustainable Production and Consumption 2010 – 2015 and the National Energy Plan 2008-2030. However, currently further substantive inputs are required to assure that the regulations effectively promote the deployment of low-emission technologies and sustainable practices (i.e. waste-to-energy, waste treatment technologies). Furthermore, the government is strengthening the policy for promoting environmentally and economically sustainable rural development through the provision of technical and financial assistance to improve productivity and sustainable utilization of natural resources. In November 2011, the World Bank approved the project "Uruguay Sustainable Management of Natural Resources and Climate Change", where the Ministry of Livestock, Agriculture and Fisheries (MGAP) acts as the responsible agency. The development objective of the project is to support Uruguayan efforts to promote the adoption of improved environmentally sustainable and climate-smart agricultural and livestock practices amongst farmers. This is to be achieved through the development and implementation of instruments that would provide farmers with critical and timely information for the adoption of improved on-farm natural resources management as well as technical and financial assistance to promote investments in their production systems aimed at reducing risks and making them more resilient to extreme climatic events.

In addition to addressing primary sectors' waste issues, a proper management of urban solid waste is also a fundamental part of a country's sustainable development. In this sense, the Ministry of Housing, Territorial Planning and Environment (MVOTMA) is planning and improving the waste management system, promoting recycling, energy production and other forms of waste valorisation. In Uruguay, municipal solid waste generation is estimated at 2,200 tons per day, with 58% of organic matter. Outside the Metropolitan Area of Montevideo (AMM) only 3 of the 24 surveyed landfills are in acceptable condition, however, generating significant negative environmental impacts. Moreover, the "Solución Nacional de Transferencia de Residuos a Energía" (National waste-to-energy solution) is a national initiative that addresses the urban waste issues involving the Montevideo Metropolitan Area and the capital cities of each Department. Urban domestic waste is currently being disposed of in landfills but it is not widely used as

[9] Source: http://www.iadb.org/en/projects/project-description-title,1303.html?id=UR-M1041

an energy resource. As stated, this "Solución" addresses big cities only, leaving out those cities with a reduced population.

Primary production sectors in Uruguay (poultry, dairy, swine, feedlots, slaughterhouses, etc.) have as common practice the use of open anaerobic lagoons to collect and treat waste / wastewater. The digested sludge is then applied to the soil when the time to empty the lagoon comes. This is the business-as-usual, with the digestion efficiency not being the best in comparison to newer second and third generation technologies, which can be designed and adapted to operate under local environmental conditions throughout the year to guarantee appropriate wastewater treatment. The main reasons why modern technologies are not widely applied in the country are the lack of cutting-edge technology at national level plus the accompanying lack of human resources with the knowledge to operate such equipment, as well as the lack of available financing instruments that would enable farmers to invest in new technology.

In addition to the on-going activities mentioned above, the Government of Uruguay also takes part in other initiatives and receives support from multilateral and bilateral agreements, such as the upcoming MGAP/World Bank programme "Sustainable Management of Natural Resources and Climate Change". The agricultural and farming sectors in Uruguay are subject to substantial changes, i.e. leading to a more intensive land-use. This trend exacerbates the adverse local environmental impacts of residues. The sector is also vulnerable to climate change. The upcoming MGAP/World Bank project pursues the establishment of an encompassing information system to predict and prevent climate effects. This project has a clear focus on adaptation to climate change rather than on mitigation actions.

The country also has experience in implementing inter-ministerial initiatives. Two examples are "Gabinete Productivo", where MGAP and MIEM jointly collaborate in the analysis of the energy sector's performance and in the identification of measures for improvement and "PROBIO" (Electricity Production from Biomass in Uruguay), a GEF project where MVOTMA (specifically, DINAMA), MGAP and MIEM (specifically, DNE) collaborate in its implementation.

The mentioned initiatives would lead to an improvement of many of the issues that the country faces mostly in terms of managing energy demand and addressing climate change through renewable energy promotion, but not specifically in terms of waste valorisation, waste management and by-products generation. Moreover, the development of the national waste management initiative is mostly focused on larger waste generators i.e. larger cities, leaving small cities in need of a solution.

With regards to wastewater discharge, the country would probably develop new or modify existing regulations to establish discharge limits thus forcing companies to implement treatment applications in their operations. Again this is likely to target larger generators (here, larger companies) rather than smaller ones, and would also affect companies depending on the effluent that is being regulated.

Statement of the problem:

The problem addressed by the project can be described from both the environmental, social, regulatory and technological points of view:

I. The (solid and liquid) waste flows from the primary and secondary production sectors and the municipal solid waste in Uruguay entail a threat for the protection of the environment and the communities' wellbeing.

   With regards to the waste generated in the agricultural and agro-industrial sectors, the waste mapping conducted during the PPG phase (see Annex K) concluded that the main waste generator is the feedlot sector (29% of the generated waste), followed by bovine and ovine slaughterhouses (23%) and in third place all the municipalities with a population between 1,000 and 5,000 inhabitants (12%). These volumes were estimated on a dry basis without taking into consideration physical-chemical characteristics or energy generation potential. Most of the information collected and used for the estimates comes from DINAMA. The next figure shows the origin and the percentage of the waste generated.

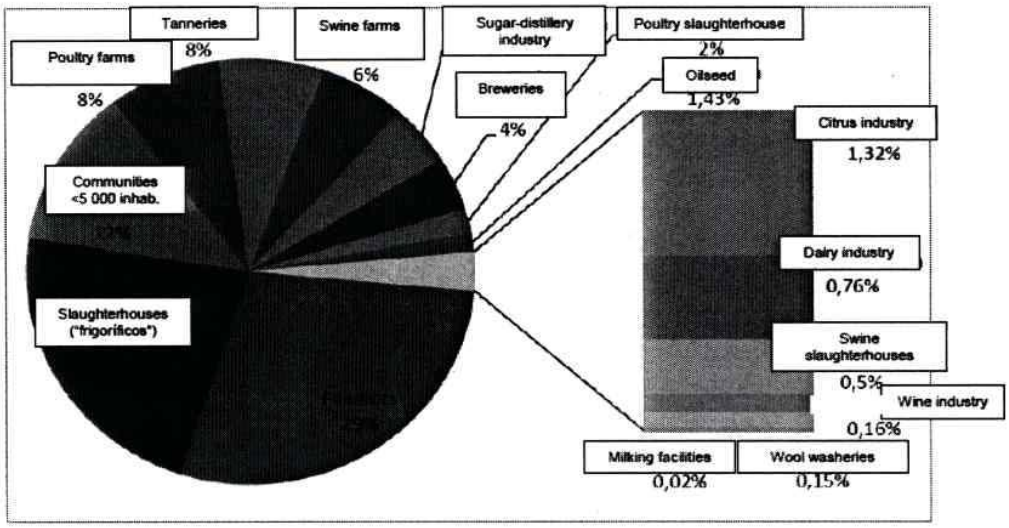

FIGURE 1: PERCENTAGE AND ORIGIN OF THE WASTE AT NATIONAL LEVEL PER SECTOR

The inadequate handling of waste constitutes a significant potential for greenhouse gas emissions that contribute to global climate change as well as to the dispersion of diseases. In accordance with the 2004 GHG Inventory, emissions from agriculture were 821 ktonCH$_4$ and from solid waste and wastewater treatment 64 ktonCH$_4$, adding up to 885 ktonCH$_4$ (or 18,585 ktonCO$_2$e).

II. The traditional production methods applied by small and medium farm holders do not generally include an appropriate waste management or valorisation solution. The adoption of cleaner production methods that can increase productivity and reduce GHG emissions faces several barriers, such as limited access to financing options and promotion mechanisms, low awareness of environmental issues, lack of knowledge about more environmentally friendly production processes, and access to better technological solutions for waste valorisation. There are a number of underlying structural factors affecting this target group that need to be solved[10].

III. Larger companies often face barriers if they want to include an appropriate waste management system as part of their production process. Most of the existing undertakings apply first generation waste treatment technologies so barriers are mostly related to having access to novel waste valorisation technologies such as second and third generation technologies, which are not easily available in the country along with the necessary training to operate and monitor them.

IV. Policy and regulatory frameworks are also a vital part of the system because without the appropriate mechanisms and incentives, it is not possible to have access to the best technological solutions or to financing options that would ease the implementation of waste valorisation options.

V. Lack of local capabilities to undertake waste valorisation projects. If people were trained and aware of the benefits that waste valorisation projects bring, local human resources could bring solutions to local stakeholders and could teach and promote the benefits of having waste valorisation, management and waste treatment technologies as part of a countrywide low-carbon sustainable development model.

Barriers that the project intends to address:

1. Technological barrier:

The current technological options available for waste valorisation technologies in Uruguay are limited due to the fact that, traditionally, an end-of-pipe approach was considered in this market. A historical lack of urgency exists and an

[10] Including: a large heterogeneity of farm holders, lack of property rights, underinvestment, generational continuity, exposure to climate risks, price volatility and currency exchange risk. Half of the area used for dairy farming is not owned by the farmer. Source: Cadenas de Valor (I), Gabinete Productivo, August 2008.

insufficient technological basis is faced. As a consequence, the currently available in-country knowledge and capacities for the massive implementation of novel sustainable low-emission waste valorisation technological alternatives to reduce GHG emissions in the primary sectors are not sufficient to achieve a country-wide implementation of such alternatives. Moreover, a regional and integrated approach for waste valorisation (including life cycle concept, development and adaptation of technologies) is still lacking.

For a country that relies on agricultural and meat products' exports, the technological gap constitutes a major flaw in the production chain compared to competitive economies. For example, even though in the area of anaerobic treatment reactors can be imported or built locally, the major challenge lies in the design and optimization of the biological processes under local ambient conditions and feedstock composition. In fact, one of the most relevant technological barriers for the application of wastewater treatment reactors in the agricultural business is to maintain a constant working temperature of the system. This requires the transfer of knowledge from leading countries in this field to research institutes, sector agencies and professionals as well as, potentially, the transfer of the technology itself. Laboratory tests and industry-scale reactors can provide valuable information on process stability and optimization and reduce the risk of failure of full-scale investments.

Therefore, further efforts are needed in order to effectively promote the implementation of environmentally sound technologies, use of renewable energy technology, valorisation of waste and low-emission waste treatment. Technological solutions should be put in place in order to improve energy production and other forms of waste valorisation, as well as promoting markets for selling secondary raw materials. Furthermore, in addition to looking at renewable energy as an outcome, residues can be also managed in a variety of ways, including the development of marketable residual products used for soil fertilization or conditioning and to produce cattle food. Moreover, producing ethanol from straw (rice straw, wheat straw, oat straw) can be considered as a way of making a good use of available biomass.

Different types of agents have been identified to deliver technological solutions. The largest source of technological knowledge in the country is the national university (UdelaR), which has laboratories and staff working on wastewater treatment. Other agents include sector organizations and cooperatives (including INIA[11] and CONAPROLE[12]), but there are also consultancies and individual professionals that offer services for the primary sector. In the field of energy efficiency, energy service companies (ESCOs) have been formed with support from the World Bank Energy Efficiency programme. However, the present overall infrastructure in terms of technological know-how, staff, laboratory facilities and commercial service companies is insufficient to address the market.

2. *Policy and regulatory barrier:*

In addition to the unavailability of cutting-edge technology in the country, there is a lack of specific regulation that favours the application of effective waste recycling and low-emission treatment technology. The National Environmental Directorate (DINAMA) is developing improved regulation, but inputs on technological aspects are needed. It is also recognized that implementing more stringent regulation will not be effective if appropriate technologies are not available.

Currently, there is a legal and regulatory framework for the energy, agribusiness and environmental sectors. This framework comprises acts, decrees, regulations and resolutions, covering the period 1977-2012. With regards to clean energy, the existing framework involves:

- The promotion of energy generation from agro-industrial and agricultural wastes: the current framework allows generation from biomass. However, there is no specific standard focusing on biogas production, management or consumption.
- The promotion of liquid biofuels: it focuses on bioethanol and biodiesel (but not from organic matter disposed as waste).
- There is no specific regulation focusing on the use of dry, pelletized or compacted cow manure as energy source.
- There is no specific regulation related to the application of treated manure for soil "fertigation".

[11] Instituto Nacional de Investigación Agropecuaria
[12] Cooperativa Nacional de Productores de Leche

All the applicable instruments have been focused on wind power, biomass, biofuels and solar thermal energy. Further details on the policy and regulatory barriers are included in Annex H.

3. *Financial barrier:*

As a general first impression, those activities intended for waste valorisation do not contribute to the improvement of the economic status of an organisation because they do not entail economic gains in the short term. This is one of the reasons why it is difficult to obtain a bank credit (or a similar financial instrument) to pay for new technology.

Access to finance is a serious barrier for small and medium-sized agricultural producers, dairy farmers, feedlots and swine farmers. The recently approved IADB/MIF energy efficiency project will address dairy farmers through the cooperative CONAPROLE. Fiscal benefits are already foreseen to stimulate investment in cleaner production technologies, including renewable energy options. Nevertheless, the profitability of biogas use in replacement of fossil fuels may remain marginal, which suggests the need for establishing some additional (investment) incentive. With regards to the financial barriers identified during the PPG phase (see Annex I), they are related to:

- As the small producers' borrowing capacity is low, the amount of credit that a financial organisation (e.g. bank) can provide to these producers is not enough to cover the technology costs.

- The existing mechanisms to facilitate the presentation of a guarantee by a producer (in order to access funds) have not proven as successful as anticipated due to the implementation procedures (please see Annex I for further details). For instance, it is difficult to access a guarantee without a mortgage on the company or without entailing high costs. The risk analysis undertaken by the banks is sometimes the factor that determines if the bank credit will be granted or not. New and unknown technologies may induce financial organisations to put certain restrictions that prevent small producers from obtaining a bank credit.

Additional information on the financial aspects is analysed in Annex I.

4. *Information and awareness barrier:*

Mainly amongst small and medium farm holders, there is poor awareness of better applicable waste management and waste valorisation technologies to have a more environmentally friendly business. This is due to three main factors: i) lack of awareness about the negative environmental impacts that their common practices can have, ii) amount of waste generated is small and thus it is too expensive to carry out individual initiatives, and iii) absence of appropriate mechanisms to promote the investment in such technologies makes it difficult to change their practices.

In addition, there is no clarity at country level with regards to the potential in terms of energy generation and emissions reductions that these kinds of projects could bring. As fossil fuel prices continue their increasing trend, alternative energy generation options (e.g. biogas from anaerobic treatment) will become more attractive. Moreover, biofertilizers generated through waste valorisation activities (e.g. irrigation with treated liquid manure) may reduce the need for acquiring other fertilizers in the market thus having a positive impact on the farm's economy.

Technologies design, application and performance are very site-specific and system-specific and thus their efficiency needs to be proved on site to become reliable before becoming fully available in the market. Demonstration projects can be used to learn and provide capacity building for human resources, and adjust the technological aspects to the local conditions. It is crucial that the people that will operate these plants are properly trained to solve problems immediately to avoid serious operative problems such as when the waste treatment systems have to stop working.

A. 5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

Under the baseline project, the barriers and the problem would not be adequately addressed, which provides a rationale for GEF involvement. GEF financing will provide the necessary catalytic support to create and sustain a market environment conducive to investments and adoption of appropriate waste valorisation, waste-to-energy and waste management technologies that contribute to climate change mitigation and bring other associated environmental benefits. The proposed project and methodological approach will lay the grounds for a learning, know-how transfer and

in-situ technological capabilities development, which ultimately will drive the replication of this kind of activities in the future towards one common objective: achieving a green low-carbon sustainable development model in Uruguay.

Therefore, in order to address the described barriers and to complement the mentioned on-going initiatives, a project for economically, environmentally and socially sustainable agribusiness development is herewith proposed by means of including and adopting a range of sustainable waste valorisation and low-emission waste treatment technologies in the primary production sectors of Uruguay that would lead to a reduction in carbon emissions and to the transformation of different kinds of waste into energy and other by-products, all leading to the generation of a sustainable low-carbon production model.

In response to the findings of the PPG, the strategic results framework for the Project has been revised and the following changes have been included, in comparison to the original information contained within the PIF:

- Inclusion of Project Component #5. This has been added to accommodate for monitoring and evaluation, involving UNIDO co-financing.
- Financial instrument: the structure of the fund (i.e. the financial instrument) will be designed during project execution as will the procedure for capital rising, based on the country's previous experience in projects of this sort. Uruguay has successfully applied this fund structuring model in WB-GEF 'Energy Efficiency Project'. See Project Component #1 below for further details on the referred project.
- A Call for Proposals will be undertaken as part of Project Component #3, "Portfolio of demonstrative small waste valorisation projects", covering several waste-related opportunities. The objective of including this is to receive innovative proposals from the private sector by means of using the information that the project will generate (studies and mapping).
- The budget allocation and amounts have been modified; especially the co-financing to be received from the private sector has significantly increased (please see budget details and allocation to each of the activities in Annexes G and F). Most of the additional budget has been allocated to activities under PC#3. Increasing the available budget for this activity will provide the opportunity to conduct a more profound analysis and demonstration of the applicability of waste valorisation technologies in different sectors and under different scenarios, thus allowing for a wider scale-up and replication of the projects.

The **development objective** of the project is:

Transform the different kinds of waste generated in the agriculture and the agro-industry production chains in Uruguay into various types of energy and/or other by-products with the aim of reducing GHG emissions, while contributing to the development of a low carbon sustainable production model supported by an adequate technology development and transfer.

The objective of the project is pursued through the following five components:

PC I. Policy and regulatory framework strengthening

PC II. Knowledge base (technological capacities) in the field of waste-to-energy, waste valorisation and low-emission waste treatment technologies strengthened

PC III. Demonstration of waste valorisation and renewable energy technologies' applications

PC IV. Capacity building, training and dissemination campaign for the adoption of low carbon waste valorisation initiatives

PC V. Monitoring and Evaluation

PROJECT COMPONENTS AND ACTIVITIES:

Project Component #1: Policy and regulatory framework strengthening

Expected Outcome from PC1:

The policy framework to promote sustainable production schemes and implement low-emission technologies in prioritised sectors (agricultural and farming sector, processing industries, small communities) has been strengthened.

The activities to be undertaken under PC1 are intended to adjust the regulatory and policy frameworks in order to promote investments and allow the development of waste valorisation projects to generate energy, by-products and reduce GHG emissions. These activities also involve the removal of financial barriers and the development and implementation of policies, provisions and guidelines for financial instrument(s) that will lead to the deployment of waste valorisation projects in Uruguay.

1.1 Establishment of a task force coordinated by DNE/DINAMA/MGAP[13] responsible for preparing strategies in the targeted sectors.

Based on the analysis of the existing gaps and barriers in the policy and regulatory framework done during the PPG phase (see Annex H) and to aid the establishment of a task force, a workshop targeting policy-makers and regulators will be carried out. The workshop has specific objectives, described below:

- to discuss the identified gaps and barriers such as implementation procedures, challenges in applying existing instruments, etc.;
- to identify other countries in the region that might be used as examples to take ideas from or that have faced and solved similar financing/policy/regulatory issues;
- to provide the regulatory and policy-making bodies of Uruguay with relevant information and tools to increase their capacity in creating policy and regulatory frameworks capable of promoting sustainable production schemes that include the waste valorisation dimension, supporting the deployment of low-emission technologies, promote environmental responsibility amongst actors and open new market opportunities by means of, for example, offering financial incentives;
- to establish a taskforce that will be responsible for preparing strategies for the targeted sectors and for following-up the implementation/modification of the agreed instruments;
- to address the findings of the report on regulatory and policy frameworks done during the PPG phase.

The main outcome of the workshop is a solid proposal for the improvement of policy and regulatory frameworks. This will be done by conducting specific studies in the fields that were discussed during the workshop. The studies to be conducted will form output 1.2. The workshop will also explore synergies with other on-going mitigation actions such as NAMAs.

The taskforce to be established will be composed of representatives from the National Energy Directorate (Dirección Nacional de Energía, DNE), the National Directorate for the Environment (Dirección Nacional de Medio Ambiente, DINAMA), the Ministry of Agriculture, Livestock and Fishery (Ministerio de Ganadería, Agricultura y Pesca, MGAP) and UNIDO and coordinated by DNE/DINAMA/MGAP. The Task force will:

- Conduct detailed studies along with consultants and monitor the evolution of those to identify measures and incentives that help overcome the barriers;
- Monitor any other activity related to policy and regulatory frameworks improvement; and
- Prepare strategies for each sector involved in this project, based on the results of the above.

It will be its responsibility to monitor the evolution of the detailed studies and any other activity related to policy and regulatory frameworks improvement.

It is envisaged that the following organisations and stakeholders are likely to participate in the workshop:

- DNE
- DINAMA
- MGAP
- UNIDO

[13] DNE: Dirección Nacional de Energía (National Energy Directorate), DINAMA: Dirección Nacional de Medio Ambiente (National Directorate for the Environment), MGAP: Ministerio de Ganadería, Agricultura y Pesca (Ministry of Agriculture, Livestock and Fishery).

- Local financial institutions (public and/or private)
- Local decision-makers in the field of regulations and policies
- Representatives of the municipalities and cities
- Other strategic partners and stakeholders, including from the private sector

Gender balance will be encouraged for participation in the workshop and during the discussions in order to generate broad-based ideas to improve the policy and regulatory framework.

Women from DNE/DINAMA/MGAP will be encouraged to be part of the Taskforce.

1.2 Studies have been carried out as inputs for enhancing policy instruments covering at least 10 fields; amongst others, these include: i) biogas production and uses of biogas; ii) production of synthetic diesel from organic matter; iii) use of dry manure for combustion, iv) production and application of biofertilizers to the soil.

Based on the workshop results, the taskforce in collaboration with national / international consultants will be in charge of conducting detailed studies to complement the analyses made so far. These studies will investigate the applicability and feasibility of the discussed measures and incentives as well as identify if there are other necessary changes to be made in the Uruguayan context to apply them. Afterwards, those that would be applicable in the short, medium and long term to each of the targeted sectors (agricultural and farming sector, processing industries, and communities) will be selected, prioritized and described.

The report done during the PPG Phase (see Annex H) shows that there is a need to address the policy and regulatory gaps in at least the following fields:

1. Biogas production and uses of biogas (thermal, electric). The current policy and regulatory framework allows energy generation from biomass sources but there are no specific rules addressing biogas producers (such as an official registry), or biogas standards addressing safety issues during biogas production, storage, transportation, management, etc.
2. Biofuels: the current framework addresses bioethanol and biodiesel production but it does not consider the production of synthetic diesel from organic matter.
3. Use of dry manure, either compacted or pelletized, for combustion or for other applications. There are no regulations addressing this specific field.
4. Production and application of Biofertilizers to the soil (e.g. "fertigation" with treated manure). There are no regulations addressing this either.
5. Standards addressing the treatment and valorisation of waste from agriculture and agro-industries.
6. Infrastructure. The design of the infrastructure has to take into account the waste valorisation. For example, feedlots could be designed to facilitate the manure collection.
7. Storage capacity of manure and digestate (to be compatible with atmospheric emission law).
8. Transport of biogas, wastes, digestate, biofertilizers and other by-products.
9. Study of current anaerobic lagoon covering systems to provide elements for the new regulations. This study can include an analysis of the impacts in terms of GHG emissions reduction potential and biogas recovery.
10. Study of energy production from waste valorisation other than biogas.

The taskforce will be in charge of coordinating the development of the detailed studies, and in charge of following up on how to results from the studies can be best used for improving the policy and regulatory framework.

The studies will be used as inputs for improving policy instruments in the fields of: (i) regulations that promote sustainable production schemes, access to novel waste valorisation technologies, (ii) promotion of environmental responsibility, (iii) development of market opportunities; and (iv) existing financial incentives.

The policies and regulations to be developed, which are aimed at implementing new instruments, should have the necessary political support from the government bodies in order to be successful, and also be based on:

- specific technical studies (such as the ones mentioned before),
- collaboration networks involving different stakeholders,
- consideration of the geographical dimension and spatial planning in the decision making,
- strengthening the technical capabilities of the sectors' organisations, and
- a clear dissemination strategy

1.3 Development and implementation of an action plan to remove financial barriers and provide applicable mechanisms and instruments to favour the inclusion and adoption of new low-carbon waste valorisation technologies in the targeted sectors.

1.4 Identification and design of financial instrument(s) targeting low carbon technologies for waste valorisation and identification of local financial institutions (e.g. banks) that will implement the scale up of the technologies after this project is completed

Several financial barriers impede the widespread uptake of low-emission technologies in prioritised sectors and need to be addressed. This activity will be carried out in conjunction with the previous activity. The financial barriers that could be addressed along with the improvements of the policy and regulatory framework will be identified and appropriate measures determined accordingly.

The taskforce will develop an Action Plan to be applied at national level, which will be mainly focused on the targeted sectors. The taskforce will discuss alternatives to remove the financial barriers, what the impact (benefits) of removing them will be and if possible quantify those impacts. The taskforce will then prioritize the measures to be applied in order to remove the barriers and will implement these. As indicated in the report on financial barriers (see Annex I) developed during the PPG phase, the objectives to develop new financial mechanisms are:

a) Promotion of credit and financing policies

b) Establishment of networking and cooperation platforms amongst companies to foster their associative and individual capacities

c) Development or strengthening of local institutions

The financial barriers encountered can be addressed by means of implementing different financial instruments and/or incentives; several of which were identified during the PPG phase (see Annex I). These will be further analysed in light of the findings derived from the detailed studies and the workshop. The potential measures identified are:

1. Support for the grouping of SMEs, promoting the creation of local production centres
2. Provision of financial advice and financial capacity building for SMEs with respect to submission / applications (to comply with the FIs requirements)
3. Microcredits
4. Micro-leasing
5. Green credits
6. Technical and economic assessment of SMEs' environmental projects
7. Funds for technical assistance in cleaner production
8. Funds for re-conversion and identification of new businesses
9. Other options, including amongst others: provision of funding from business groups to their member companies, development of national plans, local implementation of tax credits.

Out of these, it is expected that priority will be given to measures 1., 2. and 6. as well as 3., 4. and 5. (which are considered within the same line of action) during the course of the project.

The country envisages designing a financial instrument (most likely a revolving fund), that will aid in the provision of technical assistance to companies considering waste valorization as well as facilitate incentivisation of such projects.

The country has experience in implementing financial instruments from other GEF projects: the Energy Efficiency Trust (FEE[14]) and the Uruguayan Saving and Energy Efficiency Trust (FUDAEE[15]). In August 2004, the Uruguayan government and the Global Environment Facility (GEF) signed a grant agreement with the purpose of implementing the 'Energy Efficiency Project' (GEF Project ID# 1179) executed by the World Bank, which aims to increase the demand for and competitive supply of energy-efficient goods and services, contributing to: (a) improved efficiency in energy use; (b) reduced reliance of the Uruguayan economy on imported electricity and fuels; and (c) reduced emissions from the energy sector. In order to remove the barriers related to access to financing energy efficiency activities the law that has been established entrusts the Ministry of Economy and Finance (MEF) and MIEM with the creation of FUDAEE. The aim of the trust being to provide funding for technical assistance in energy efficiency, promote energy efficiency nationwide, finance energy efficiency project implementation, promote research and development in energy efficiency and act as a contingency fund in crisis junctures of the energy sector. The annual capitalization of FUDAEE nowadays reaches approximately 3 million USD. The Energy Efficiency Trust (FEE) is a guarantee fund created to encourage companies and other energy users to develop energy efficiency projects. The FEE capital amounts to a total of U.S. $ 2,475,000, which enables so-called Intermediate Financial Institutions to provide loans for energy efficiency projects. All measures mentioned above (1.-9.) will be analysed with respect to their social and environmental impacts using a cost-benefit approach. The analysis will be helpful for the decision-making process on which instruments should be prioritized and developed as part of a new policy or the modification of the existing ones.

1.5 Development of new policy / regulation draft or revision of existing policy / regulation based on the pre-identified areas.

After the previous activities have been concluded, the taskforce will have a better understanding of the financial mechanisms and/or incentives that could be applied, particularly after the specific studies have been conducted and after the action plan to remove financial barriers has been decided, revised and approved by the involved ministries and government bodies.

If a need for the development of new policies, regulations or decrees and / or the revision of existing ones has been identified, then the goal of this task is to develop a draft proposal for:

- Modifying the existing policies, and/or
- Creating new ones

The draft proposal will be submitted to the corresponding authority for final approval and revision and the taskforce will monitor its progress.

The studies to be carried out and proposals for policies and regulations will include an analysis of the gender dimension by means of studying the possibility of applying specific measures and market opportunities that could especially benefit women, which are in vulnerable conditions, such as poor and/or rural women.

Project Component #2: Knowledge base (technological capacities) in the field of waste-to-energy, waste valorisation and low-emission waste treatment technologies strengthened

Expected Outcome from PC2:

The design and implementation of waste-to-energy valorisation alternatives and low-emission waste treatment technologies have been enhanced due to an improved knowledge base.

During the PPG phase several activities were conducted with the aim of:

- Identifying and locating waste sources (mapping and characterisation)
- Characterising technologies available globally (state-of-the-art)
- Identifying market and technology barriers, as well as opportunities for waste-to-energy, low-emission waste treatment and waste valorisation technologies

[14] Fideicomiso Eficiencia Energética
[15] Fideicomiso Uruguayo de Ahorro y Eficiencia Energética

- Assessment of technological needs and available technological knowledge base in Uruguay (e.g. laboratories, research facilities, human resources, etc.)

Based on the results obtained during the PPG phase (see Annexes J, K and L), the following activities are proposed at this stage to achieve the desired output:

2.1 Disaggregated (department level) physical and chemical characterisation of at least the 16 identified waste streams with valorisation potential.

The preliminary mapping conducted during the PPG phase (see Annex K) shows that there are several identified waste sources to be addressed and, if they are appropriately managed, they would contribute to climate change mitigation. The results obtained at PPG stage were used to carry out a preliminary estimate of the waste types and volumes in each agro-industrial sector (in ton/year). The main objective of the preliminary mapping of waste sources was to characterise the waste and wastewater flows and fill in the collected data in the form of a matrix, in terms of, for example, BOD, volatile solids, calorific value, etc. The following thirteen activity sectors were prioritised according to the quantities generated in light of the potential of the associated waste streams for energy from waste or other types of valorisation: 1 - Poultry, ("Avícola"); 2- Swine ("Porcinos"); 3- Malting and Breweries ("Cervecerias y malterias"); 4- Citrus industry ("Citrícola"); 5- Tanneries ("Curtiembres"); 6- Feedlot ("Feedlot"); 7- Dairy and Milk ("Cadena Láctea"); 8- Wool washeries ("Lavado de lana"); 9- Food oil industry ("Oleaginosa"); 10- Sugar and Alcohol ("Azúcar y Alcohol"); 11- Wineries ("Vitivinícolas"); 12- Slaughterhouses ("Frigoríficos"); 13- Small communities ("Pequeñas comunidades".

Based on the available data it was possible to identify the three main waste stream producers as the "feedlot" sector, "slaughterhouses (cattle and sheep)" and "small communities" (urban solid waste). Due to the nature of the data, however, only limited results with regards to the physical-chemical characteristics of the waste streams could be reported.

It was observed that from the 44 waste streams identified within the activity sectors studied, 21 have an "evident potential interest for valorization". However of these 21, only a group of 16 waste streams could be selected with potential interest for "energy" and/or "nutrients". As the information regarding the specific physical-chemical characterization of these streams is limited in Uruguay, it would be necessary to do a complete disaggregation of information in each department concerning, amongst others: number of pigs, litres of milk produced, number of dairy cows in production, beef cows in feedlots, etc. Moreover, it is suggested as part of this activity to do the required laboratory research and characterization in order to generate national data addressing those streams with a valorisation potential. In spite of the fact that, based on an extensive literature review, several technical pre-assumptions were made to facilitate the estimations of the energy potentials included in the mapping, it would be useful to generate data based on the actual, locally present waste streams. This kind of research would also improve the local knowledge base on the type of laboratory techniques that need to be applied and would generate information for the Uruguayan public, businesses, universities, NGOs, government bodies and any other stakeholders interested in developing waste valorisation technologies at national level.

Furthermore, the generation of information at departmental level would allow for a first expression of the distribution of the national potential. Therefore, it is suggested to do a complete disaggregation of information in each department of the country supported by nationally conducted laboratory analysis of waste samples. This would provide a comprehensive overview of most "promising" locations for waste valorisation activities.

Having undertaken the study of the nutrients' demand in the country as part of the waste mapping, laboratory analysis of local waste samples would also bring information about the potential application of digested liquid or solid waste/wastewater to the soil as biofertilizer due to their nitrogen and phosphorus content.

The detailed mapping will be conducted on at least the 16 most promising waste streams that were identified during the PPG phase. However, the remaining 28 waste streams will be revisited to obtain an enhanced short list of waste streams with valorisation potential.

For additional information, please refer to Annexes J and K.

2.2 Research and prefeasibility studies (including social, environmental and economic dimensions) conducted in the targeted sectors to determine the most viable waste valorisation processes and business models.

Studies, aimed at generating, collecting and providing information, advice and references on the latest cutting-edge waste valorisation technologies nationally and internationally available for the specified sectors, are to be carried out. An analysis will be conducted for each sector in order to identify their specific needs in terms of capacity building of human resources, availability of research facilities (e.g. universities) and gap in terms of technology development. Wherever possible, pre-feasibility studies will be conducted to assess the viability of some of the identified waste treatment and waste valorisation technologies in each production chain. These studies will include the socioeconomic dimension and will disaggregate the information by gender.

During the PPG phase, issues that interfere with the availability of a strong technological knowledge base in Uruguay were identified (see Annexes L and J). One of these is related to the types of business models that are usually applied. Currently, the primary business model that is being applied in the country can be referred to as the 'individual producer model'. Under this type of model, the waste to be utilised is generated at the source and treatment and use of the biogas and/or other by-products occur at the same establishment. However, the assessments carried out showed that there is a potential for applying other models such as 'producer with external waste supply input model', 'waste manager/investor model' and 'association of producers model'. These models are further elaborated in Annex L[16] and Annex J.

In analysing and designing the most suitable business-models for waste valorisation, the farmers' needs for energy and/or other by-products, the availability of the particular waste including its location, the waste's valorisation potential and the socioeconomic aspects need to be taken into consideration. Moreover, special attention will be paid to the role of gender in the application of business models in order to assure that both women's and men's needs are considered and both may profit equally.

Project Component #3: Demonstration of waste valorisation and renewable energy technologies' applications

Expected Outcome from PC3:

Waste-to-energy and other feasible waste valorisation applications have been adopted in the targeted sectors.

With the goal of proving the applicability of low-emission waste treatment, waste-to-energy, by-products generation and waste valorisation technologies in the Uruguayan context, this component aims to design, install, monitor and assess small- as well as large-scale demonstration projects in the targeted sectors. This component complements the previous component and it is intended for demonstrating the applicability of more technologically advanced waste treatment techniques, in comparison to the current "first generation" technologies that are employed in the country at the moment.

A brief description of the analysis carried out for each project during the PPG phase is described under each of the following activities. For further details on the projects, please refer to Annex M.

All the demonstration projects have a training component that includes the provision of training for personnel involved in the operation of the plants. Participation in the trainings will be monitored, segregated on a gender basis.

3.1 Four fully functional large-scale waste treatment undertakings have been commissioned (digestion of vinasse from bioethanol production, digestion of cow manure from dairy sector, co-digestion of combined waste feedstock in agro-industry and waste treatment and management project in small size cattle breeding farms).

3.4 Training of personnel on the operation of at least the four large-scale waste treatment undertakings.

a. Implementation of a project in the agro-industrial, bioethanol production sector: ALUR S.A.

The project consists of the implementation of an anaerobic digestion compact technology. This technology is a hybrid down flow fixed film reactor, very much suitable for industrial wastewater treatment with high concentrations of dissolved COD (Chemical Oxygen Demand). The results can be transferred to different industries with similar wastewater characteristics.

[16] Please see particularly chapter 3 of part b) of Annex L.

ALUR S.A. has a bioethanol plant located at Bella Unión, Uruguay. Vinasse is generated during bioethanol production from sugarcane and is currently considered as waste (wastewater). This kind of agro-industrial waste can be treated inside an anaerobic reactor in order to produce biogas. Vinasse's COD ranges from 35,000 to 50,000 mg/L), its pH is low (4.2-4.8) and the salt content is mainly from potassium. The digestate (digested sludge) can be used for other applications too such as biofertilizer for the soil. Today approximately 1,500 – 1,600 m^3/day of vinasse are produced, which are not being utilised as an energy source in the plant. Instead, the vinasse is stored in five (5) open lagoons and used for watering the surrounding area between October and February.

During the PPG phase (see also Annex M), different technology options were analysed and it was concluded that anaerobic digestion is the best option because it would provide better results in terms of:

- Reduction of odours and biochemical oxygen demand (BOD)
- Potential energy generation and savings from biogas utilization in replacement of wood chips
- Methane emissions during application of the digested wastewater (they are minimized)

Amongst the many technology providers and reactor configurations, the selected wastewater treatment for vinasse is a down flow fixed film reactor (the film where the microorganisms are attached to is fixed and is located inside the anaerobic reactor). This is considered a second generation technology and thus this project's objective would be to test the technology *in situ*. Conditioning of the biomass is important before feeding it into the reactor as bacteria depend on it for growing and digesting the organic matter. In this case, pre-treatment involves vinasse cooling and an equalization tank. This kind of reactor allows for treating high organic loads (i.e. high BOD) and load shocks.

The application of a down flow fixed film reactor is not known in Uruguay. Moreover, in this case, the use of bolted tanks was recommended, which is currently not a common construction practice in Uruguay and the region. These two facts can provide innovative solutions to the market and demonstrate the applicability of a novel technology within the Uruguayan context. The design and deployment of a demonstration project will bring relevant knowledge on the treatment efficiency, more specifically with regards to: BOD removal, adaptation of the microorganisms (inoculum) to the characteristics of ALUR's vinasse and the presence of other chemical components.

Additional options that can complement this plant will be analysed in the feasibility study. These are:

- Biogas purification and energy generation
- Increase of the irrigation area to 4000 ha (current area is 600 ha)
- Use of the digestate to replace the addition of potassium to the soil ("fertigation" – simultaneous fertilization and irrigation)
- Ozonisation of the liquid final effluent

The following figure schematizes the treatment process that will be undertaken:

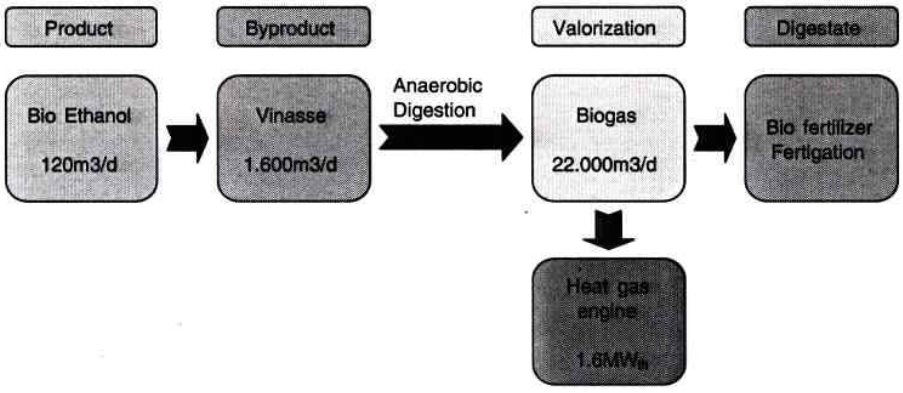

FIGURE 2: SCHEME OF THE WASTEWATER (VINASSE) TREATMENT SYSTEM AT ALUR.

Details on the investment considering wood chips replacement for biogas and partial use of potassium as soil fertiliser during irrigation are:

- Investment: approx. USD 7,300,000.
- Net income: approx. USD 619,000
- Project lifetime: 15 years
- IRR: 3%

Additional activities can be included and would involve the following investment:

- Biogas purification and energy generation: approximately USD 1,000,000. Estimated income per year would be USD 450,000.
- Increasing the irrigation surface to 4,000 ha would require USD 2,000,000, with a net income of USD 200,000 per year.

Additional information can be found in Annex M.

b. Implementation of a project in the dairy sector: biogas generation from cow manure anaerobic treatment at FAROLUR S.A.

The project consists of the implementation of an anaerobic digestion system for cow manure. It is envisaged that the biogas unit will be set up with a configuration suitable to handle a typical waste stream with high content of solids. The results can be transferred to similar options of manure management with biogas production in feedlots.

FAROLUR S.A. is a dairy products producer that has its own cattle breeding facilities where the milk is produced (feedlots). Currently cow manure generated in the stables is removed by water flushing, which, despite the fact that it adds great quantities of water and dilutes the waste to be treated, is the common practice in the region. If treatment lagoons were to be installed under these conditions, volumes would be difficult to manage and treat. The proposed demonstration project will assess all stages of the treatment process in order to design a successful biogas generation facility that uses state-of-the art technologies. Those stages are:

- Conditioning, collection and management of cow manure
- The anaerobic digestion unit
- The liquid effluent management and separation
- Heat and power generation
- The business model to operate the project and guarantee its sustainability

In this project, only cow manure will be treated. The focus will be put on the optimization of the collection, transportation and conditioning process of the cow manure from the stables to the treatment plant. One of the main goals of providing a good conditioning system is to reduce the water content of the waste. This can be achieved by means of pressing the collected manure (e.g. with a solids extruder or a press) and the advantage is that it reduces the size of the anaerobic treatment coming afterwards.

The following figure schematizes the process:

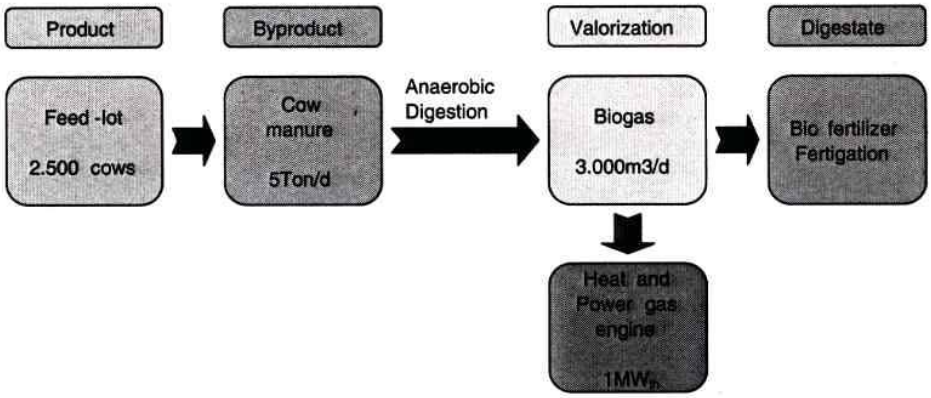

FIGURE 3: SCHEME OF THE WASTEWATER (COW MANURE) TREATMENT SYSTEM AT FAROLUR

The estimated amount to be invested in this project is USD 3,000,000.

Additional information can be found in Annex M.

c. Implementation of a project in the agro-industrial sector: energy generation with biogas from production processes' wastes at Estancias del Lago.

The project consists of an anaerobic digestion system to co-digest cow manure with other types of organic waste streams. It is envisaged that the biogas unit will be set up with a configuration suitable to handle a high content of solids within a highly efficient process=controlled system. The anaerobic co-digestion results can be transferred to similar options of manure management with biogas production within the sectors of feedlots, milking yards or swine farms.

Estancias del Lago produces powdered milk and has its own milking cows and milking yards. The company also produces vegetable oil and expeller for animal food from soybean crushing. Therefore the wastewater to be treated in the anaerobic system is composed of:

- cow manure
- animal food residues (soybean, corn)
- glycerol from the biodiesel plant
- wastewater from the powdered milk production plant
- waste from surrounding industries (still to be analysed if feasible)
- organic domestic waste from Durazno City (still to be analysed if feasible)

The unique combination of different wastewater and waste sources to be treated in a single treatment system implies specific design challenges in terms of collection, equalization, neutralization and pre-treatment (conditioning) before entering the anaerobic reactor. The anaerobic treatment will include several mesophilic complete mix reactors (diameter: 30 m, height: 10 m, temperature: 35°C) to be constructed in stages, as the population of cows is expected to increase from 3,000 to 9,000 in 2015 and other wastes are also to be included.

With regards to the treatment of the digested sludge there is interest in analysing options with great potential of replication in other farms:

- drying and pelletizing the digestate for combustion e.g. in a boiler
- pressing and drying the digestate to produce biofertilizer for soil application
- pressing and drying the digestate to produce animal food nutrients

Another important part of the process is the sanitation of the water extracted during the pressing and drying procedure in any of the cases above mentioned. This can be done by ozonisation or similar techniques that generate an applicable liquid product for soil irrigation ("fertigation").

Therefore, bearing in mind the combination of different feedstocks, the biodigestor configuration and the post-treatment and different uses that the digestate can have, this project is considered a key demonstration project.

A process flow diagram of the treatment is shown below.

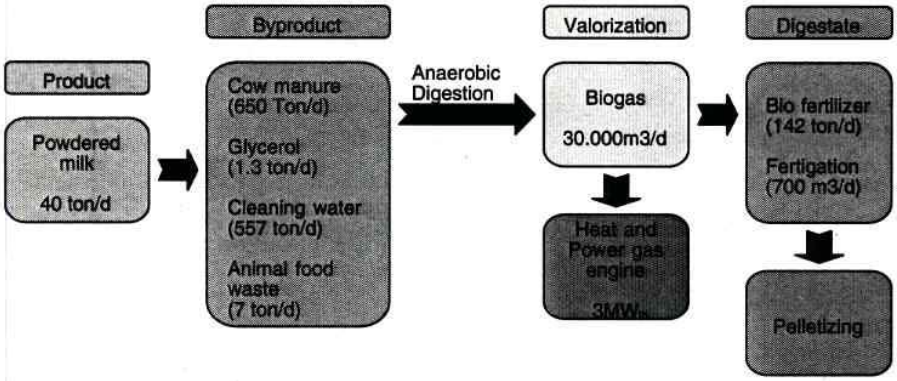

FIGURE 4: SCHEME OF THE WASTEWATER (MIX OF DIFFERENT SOURCES) TREATMENT SYSTEM AT ESTANCIAS DEL LAGO

The estimated investment for this project is at least USD 10,000,000.

Additional information can be found in Annex M.

d. Implementation of a centralized waste valorisation facility as a project in the agricultural sector: Instituto Nacional de Colonización (INC)

This demonstration project, which will be under the ownership and management of INC, involves several farmers located in the El Porvenir colony (Soriano Department). La Colonia El Porvenir is a collective of 5 groups, accessing 100 ha each with a cattle breeding potential of around 100 dairy cows per group. All milk produced by the farmers is sent to CONAPROLE (Cooperativa Nacional de Productores de Leche).

The project proposes to utilise a centralised approach for waste valorisation rather than one based at each group's facilities. That is, treatment will occur in a centralised location and thus the main challenges will lie in designing an appropriate system for waste collection, storage and transportation to the treatment point.

As a start, at least the 5 groups are to be included in this waste valorisation initiative. If, during the execution of the project, additional farmers want to be included, proper consideration will be given to analyse whether an inclusion is technically feasible. The initiative is expected to generate a portfolio of potential new farms that could be included in the future. In close collaboration with both INC and CONAPROLE, this project could be expanded continuously in the future; it represents a good opportunity to demonstrate the viability of up-scaling the waste valorisation model adopted.

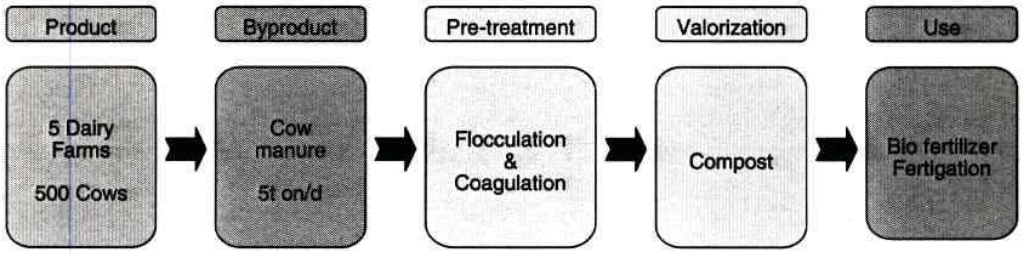

FIGURE 5: SCHEME OF WASTE VALORISATION PROCESS AT INC

The estimated investment for this project is approximately USD 13,055,000.

Synergies are also planned to be explored with a new project funded by the Multilateral Investment Fund (MIF) in partnership with CONAPROLE, which aims to help expand access to clean and efficient energy for small and medium-sized dairy farmers in Uruguay. The MIF project will support measures to improve energy efficiency in farms by combining technical assistance with financing to access energy saving technologies. Specifically, it will develop at least four types of energy efficiency solutions to be offered to farmers as well as financing alternatives for participants to implement such solutions. Additional information can be found in Annex M.

3.2 Call for Proposals for and implementation of at least five small to medium scale projects, including (i) design of the call; (ii) feasibility and technical design studies for demonstrations in medium and small sized farms / industries in the targeted sectors; and (iii) implementation of at least five full-scale projects in medium and small sized agro-industries.

3.3 Identification of a portfolio of potential waste valorisation projects.

The objective of the activity undertaken to achieve the above outputs is to facilitate the implementation of small waste valorisation pilot projects that have strategic value for the Government of Uruguay. The mechanism for this action will be to conduct a Call for Proposals in order to ask stakeholders to submit project ideas alongside very specific waste valorisation categories listed below.

The Call is to be hosted by the three ministries – Ministry of Industry, Energy and Mining (MIEM), Ministry of Housing, Territorial Planning and Environment (MVOTMA) and Ministry of Agriculture, Livestock and Fishery (MGAP) – under the here proposed project. A minimum of two calls are planned to take place during the duration of the project, with the first one targeting all prioritised technologies, while the second one will focus on those technologies that did not generate sufficient interest the first time.

The technical and economical viability of the proposals will be reviewed by an Advisory Committee, constituted of members of representatives from the ministries, local and international experts. The Advisory Committee will prepare a recommendation for the Project Steering Committee (PSC) regarding which proposals shall be pursued. Final decision lies with the PSC.

The criteria for the selection of at least five projects for implementation through this Call for Proposals shall encompass a range of criteria. The proposed projects need to

- be technologically solid and financially sound
- have a high waste valorisation index regarding electricity generation or production of fertilisers
- be presented by small or medium enterprises linked to farming stakeholders
- generate valuable lessons learnt for further dissemination after project implementation
- demonstrate strong technological innovation
- have a low environmental impact
- reflect gender mainstreaming

The selected pilot projects will not be fully funded through the Project but will require a self-commitment of up to 20%. A sub-contract will be arranged between UNIDO and each of the entities (companies) of the winning proposals for the implementation of the project.

The studies and analysis of feasible business models to be undertaken as part of Project Component #2 will be essential for carrying out the here described activity as they are expected to provide the necessary inputs for the selection of the most appropriate pilot projects under each of the categories described below. It would be especially relevant to have an appropriate physical-chemical characterisation of waste streams because the selection of the most appropriate technology depends on solids content, COD and BOD as well as biodegradability. The four large-scale projects described previously will provide valuable experience and lessons learnt with respect to the installation, operation and monitoring of waste valorisation technologies.

Following a list of waste valorisation opportunities that would demand further exploration through the projects identified with the Call for Proposals. See also Annexes J and L for further details.

a. Valorisation of cow manure generated in small milking yards for energy generation

The objective of this valorisation opportunity would be to recover the biogas produced in the treatment of cow manure. The manure generated in the milking yards, can be collected and transported to a biodigestion unit where biogas is produced through anaerobic digestion. The approach suggested here is to create several such decentralized waste valorisation systems (one in each milking yard or "tambo") located in close vicinity.

Waste valorisation from cow manure includes a series of other activities that go beyond anaerobic biodigestion. The manure has to be appropriately collected, stored and transported to the digestion system and this can prove to be difficult in feedlot facilities. Therefore, as part of the feasibility study of this initiative, focus will be also placed on the following:

1- Technology for facilitating the collection of manure and dust control, and

2- Technology for mechanical scraping

The final selection of the anaerobic digestion technology depends on the wastewater volume to be treated in each individual facility. This kind of project experience is highly replicable in other sectors and actively contributes to avoiding the GHG emissions (primarily CH_4) that would normally have been produced from the natural decay of manure. By combusting the methane, these emissions are transformed to CO_2 which has a much lower GHG warming potential.

b. Agro-industrial and municipal solid waste valorisation in centralized systems

The purpose of this waste valorisation opportunity would be to verify which are the best technological applications to obtain soil biofertilizers from different types of agro-industrial and municipal solid waste. Biofertilizers can replace artificial fertilizers and may reduce the farmers' costs as well as reduce the impact on the environment in terms of GHG emissions, water and soil pollution. In addition to biofertilizers production, biogas can also be collected as a by-product of the applied waste valorisation method used to produce the biofertilizer. The biogas can then be used in energy applications. The types of waste that may be used to produce biofertilizers are:

- Rumen content and cow manure
- Fats from tanneries
- Sludge from wastewater treatment plants
- Fats from the production of dairy products
- Remains from grapes utilized in the wine industry
- Expired food products
- Swine slurry
- "Red water" solids (slaughterhouse wastewater)
- Chicken beds
- Urban (organic) solid waste

The approach proposed hereis the application of a centralized waste valorisation plant that would receive different kinds of wastes coming from several agro-industrial facilities located in the same region. Particularly relevant is a focus on "co-digestion" technologies as they integrate different waste streams of a region under the same treatment system.

GHG emissions i.e. methane emissions would be reduced thanks to a reduction in the amount of waste sent to landfills or left to naturally decay in the environment (under anaerobic conditions).

There are also additional environmental benefits from this kind of approach:

- Waste impact on the environment (on soil, water and air) is minimised because uncontrolled dumping and effluents discharges are reduced or eliminated.

- Solid biofertilizer application and "fertigation" (irrigation with liquid biofertilizer) reduces the need for artificial fertilizers.

c. Agro-industrial waste gasification and combustion in torsional chamber

The gasification process is applicable to several types of agro-industrial waste. The gasification and combustion process is an option that can be used to replace energy consumption from other sources, e.g. fossil fuels. The gasification process transforms biomass into a combustible gas that can be burned in a cyclonic combustion chamber or "torsional chamber". Tests can be conducted with different types of waste to evaluate their efficiency and choose the best suited.

The common practice in Uruguay is to burn waste in improved and basic boiling racks, where no energy is recovered and CO_2 emissions are generated.

Emissions reductions of this process would come from replacing the use of fossil fuels with biomass for energy generation.

d. Nutrients and soil fertilizers generation from valorised waste

The preliminary waste mapping, conducted revealed that there are vast possibilities for using the nutrient content of the various types of waste available. The information collected at departmental level regarding the demands of N (nitrogen) and P (phosphorus) for the beef and dairy sector and for the dry land farming agriculture, showed a total national demand of approximately 139,000 tons of N and 180,000 tons of P. Considering the nutrient demand at departmental level, it can be realized that in many cases the demand for N and P exceeds the potential, total nationally available supply. This constitutes a favourable scenario for the implementation of waste valorisation initiatives for nutrients production and/or application on grassland and cropland, in particular from the dairy and swine farms.

Amongst the different options considered for waste valorisation, the most promising one in the case of the solid phase is composting (aerobic treatment). There is great potential to analyse waste management options (collection and pre-treatment before digestion) to separate the liquid and solid phases before composting the biomass. The liquid phase can be further treated to remove the remaining organic load and then be used for fertigation. The compost will be used as biofertilizer.

e. Generation of electricity through valorisation of waste different from manure

This waste valorisation opportunity aims to test energy generation applications using valorised waste different from cow manure. For example, some types of organic matter can be transformed into synthetic diesel, biodiesel or other combustible biomasses that can be used for electricity generation.

Waste sources different from cow manure can be associated with industrial and agro-industrial processes such as the wine industry, the citric industry, olives production, etc.

Urban solid waste can also be considered an energy source for electricity generation.

Emissions reductions in this kind of initiative would come from displacing fossil fuel based electricity generation by using renewable energy sources (biomass).

It is envisaged that, based on the knowledge and experiences gained from these pilots as well as from the previous outputs (especially Outputs 2.1, 2.2 and 3.1), a low carbon sustainable production model can be developed. This model shall be tested and further refined, during the future implementation of the portfolio of potential waste valorisation projects identified (under Output 3.3).

Project Component #4: Capacity building, training and dissemination campaign for the adoption of low carbon waste valorisation initiatives

Expected Outcome from PC4:

The capacities of sector agents to deliver state-of-the-art sustainable production schemes through sustainable waste management and low-emission treatment technologies in prioritized sectors have been strengthened.

The following activities will be undertaken to complement the work done in the previous phase and to fulfil the individual outputs and the overall outcome of this PC.

4.1 A running web-based knowledge mangement platform has been set up.

A web-based knowledge management platform will be developed with the objective of sharing know-how and experiences on sustainable production schemes amongst national and international experts, consultants, cooperatives, organisations, researchers, students and any member of the community that is interested in this kind of knowledge area.

The information that will be available on the knowledge management platform will cover waste valorisation, waste-to-energy, low-emission waste treatment, wastewater treatment, sustainable waste management techniques, waste recycling, reuse and reduction state-of-the-art technologies that can be applied to different sectors and production chains, and any other information considered relevant under this project.

The knowledge management platform will be updated and controlled by the project management unit (PMU) that will be in charge of the execution of the project. During the execution of this activity, the unit will decide upon the most apt organisation to take the lead for the future management of the platform once the project has been concluded. The aim of the organisation to be selected will be to guarantee the sustainability of the knowledge management platform after project closure.

A direct link to this platform will be added at least on the current websites of DNE, DINAMA, MGAP and the local website of UNIDO in Uruguay.

The information contained on the knowledge management platform shall be continuously updated and special attention will be paid to those contents that might have been addressed by other initiatives carried out in the country, with the goal of avoiding an over-lap of information.

Specific collaboration with the knowledge management platform will be requested from all the stakeholders involved in this project. Sharing results and experiences about the pilot projects carried out under this GEF-funded project is important to generate updated guidelines, toolkits and other bibliographic resources for the platform. Special attention will be paid to assuring that experiences and feedbacks advocate gender mainstreaming.

4.2 Creation of at least (i) 2 toolkits and (ii) 2 training courses: (i) Toolkit on identification of waste valorisation project opportunities and technological options, and toolkit on financing waste valorisation opportunities and applying successful business models; and (ii) Training course on identification of waste valorisation project opportunities and technological options, and training course on financing waste valorisation opportunities.

Specific toolkits will be developed in order to highlight lessons learnt, provide guidelines for the adoption and application of waste valorisation and waste treatment technologies and schemes, and promote their use amongst agricultural companies, small farm holders, sector organisations, etc. In principle, 2 toolkits will be developed and be available online for reference (on the knowledge management platform):

1. Toolkit for the identification of waste valorisation opportunities and technological options
2. Toolkit for financing waste valorisation opportunities and applying successful business models

If the need for additional toolkits or guidelines is identified, these will be developed.

In addition, specific training courses will be delivered in order to improve the skills of Uruguayan service providers in the fields of waste management and waste valorisation, low-emission waste treatment technologies, sustainable production schemes, corporate social responsibility, etc. These courses will be publicized on the knowledge management platform, DNE, DINAMA and MGAP websites in order to encourage people to attend. Women will be particularly encouraged to attend the courses and play an active role in the implementation and development of low-emission waste valorisation initiatives. The strategy to actively engage them will be discussed during project execution.

As part of this project the following courses will be designed and delivered for free to the attendees:

1. Course on identification of waste valorisation opportunities and technological options
2. Course on financing waste valorisation opportunities

Both the toolkit and training courses shall be designed to target individuals and companies as well as be used for train-the-trainer. It is expected that all materials will be made available on the knowledge management platform.

The inclusion of waste valorisation initiatives as part of the CSR strategy of a company will be facilitated through trainings based on the materials developed by UNIDO for this purpose[17]. CSR relates to the positive impacts that an action taken by a company may have on the community, its employees, the environment, and all other stakeholders. CSR is an important concept to consider, and the private sector should be encouraged to take action on this matter.

The objective of delivering these training courses for free is to start creating local capacity on waste-related fields associated with this GEF project and to test their effectiveness and impact on the attendees and to identify room for improvement. A survey will be conducted after each course to gather data for this analysis. The number of women and men attending the courses will be monitored in order to allow for arriving at conclusions that may be disaggregated by gender.

If the need to develop additional training courses on other specific issues is identified during the execution of the project, they will be included and developed as part of this activity.

4.3 Establishment of a network between different productive sectors to ensure the sustainability of the knowledge management platform after the project is completed.

To support the activities undertaken for outputs 4.1 and 4.2, a collaboration network will be established amongst the participants with the aim of sharing experiences and knowledge. The network will be directly linked to the knowledge platform. The network will be managed by the Project Management Unit (PMU) during project execution and, after project closure the designated organisation by the PMU that will be left in charge of the knowledge platform will also take care of the network management.

The objective of the network is to provide stakeholders with a structure to continue their collaboration after this project is finished with the goal of maintaining a sustained action towards the creation of a national sustainable low-carbon production model. This network will be useful to keep users up-to-date with regards to new technology developments (within the country and globally), national initiatives in the relevant subject areas, courses and capacity building activities and the like.

4.4 Dissemination campaign and a dissemination workshop to promote waste-to-energy, waste valorisation and low-emission waste treatment activities and to increase their adoption by farmers, industries and communities.

A dissemination campaign will be developed, which shall include a dissemination workshop as well as other tools such as making information available online (e.g. brochures about the project, technologies applied and videos about the projects will be uploaded to the knowledge management platform). The campaign and particularly the workshop aim to not only disseminate the results of the Project but also envisage to raise awareness among the community regarding the existence and uses of novel technologies to treat waste generated in various agricultural sectors as well as the relevance of such low-emission technologies within the Corporate Social Responsibility of a company.

National institutions and private stakeholders are in a position to effectively support the market for waste-to-energy and low-emission waste management and valorisation techniques implementation. In order to achieve this they need to be aware of the potential benefits such activities bring, the existing technologies to apply, the necessary operation and maintenance the technologies need, as well as the associated costs and risks.

The dissemination workshop will be carried out to transmit the results obtained through the demonstration projects (as well as the Project as a whole). The target audience will include sector agents, private companies in the agricultural and farming sectors, government officials and agencies, as well as other relevant stakeholders. Strategic partners will be invited to share their experience.

The objective of the workshop is to show:

- Benefits obtained from the application of waste treatment, waste-to-energy and waste valorisation techniques and activities in each of the prioritized sectors
- Specific technical results in terms of GHG emissions avoidance and reduction, fossil fuels consumption, improvement in production processes (e.g. reduction in raw material demand, reduction in generated waste, etc.)

[17] See www.unido.org/reap for further information.

- Benefits in terms of costs
- Challenges faced during the implementation of the demonstration projects

Feedback from the attendees will be collected via a survey after the workshop for statistical purposes and analysis of the workshop's impact. Results of the survey will be disaggregated by gender in order to identify if there are any kind of issues that affect one gender more than the other.

Local newspapers and local agriculture magazines/journals will be invited to the dissemination workshop and encouraged to write about the outcomes of the Project. Local multipliers will be contacted in order to collaborate with the planned dissemination campaign and stakeholder engagement (e.g. NGOs, government agencies, etc.).

Finally, a limited quantity of people will have the opportunity, as part of the workshop sessions, to visit one of the 4 demonstration projects. The quantity of people (women and men) attending will be defined during this activity.

4.5 Generation of knowledge about the waste valorisation field through the collaboration with universities.

Local universities will be contacted in order to involve them in the generation of knowledge as well as in the research and development activities that will be carried out to start developing stronger technological resources for the country.

Particularly, the "BIOPROA" working group of UdelaR (Universidad de la República Uruguay) can contribute with R&D activities intended to improve the knowledge base in the waste valorisation field, namely:

- Develop an easy-operation biodigester prototype for small milking yards at an appropriate cost, having agreed the management conditions with the users.
- Assessments of agro-industrial waste co-digestion, as well as studying the applicability of biofertilizers to the soil
- Study nutrients removal by means of applying struvite (phosphorus-based mineral), adjustment of the process, application assessment of the generated solid,
- Study the design of high load reactors for easily biodegradable effluents
- Study the design of concentrated effluents treatment (vinasse and whey)
- Study the design of plug flow reactors for manure treatment

Project Component #5: Monitoring and evaluation

Expected Outcome from PC5:

A monitoring plan has been prepared and implemented.

5.1 A monitoring plan has been designed and agreed upon during the Project's inception phase.

5.2 Project progress on defined indicators and compliance with UNIDO and GEF guidelines (including gender) is being monitored

5.3 A mid-term evaluation and terminal evaluation have been conducted

Monitoring of project progress is essential for the adequate and timely delivery of results. This project component covers project monitoring and oversight by UNIDO in close coordination with MIEM (DNE), MVOTMA (DINAMA) and MGAP, as well as a mid-term and terminal evaluation of the project. Independent consultants will be contracted to perform the mid-term and final evaluation of the project in compliance with UNIDO and GEF requirements.

Please refer to section C. for further details.

Global Environmental Benefits:

Calculation of environmental benefits in terms of GHG emissions:

With the implementation of this project, an increased emphasis on waste valorisation initiatives is expected to reduce GHGs emitted in the primary sector (agriculture) and will thus generate global environmental benefits in the form of direct and indirect GHG emissions reductions and avoidance.

The estimate of emissions reductions was done following the *Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects (April, 2008)* as well as the *CO_2 Spreadsheet* provided by GEF. Moreover, the *2006 IPCC Guidelines for Greenhouse Gas Inventories* were used as reference.

Direct Emissions Reduction:

Part of the outputs of the project will be the implementation of waste valorisation projects, which will result in direct greenhouse gas emissions reductions during the project's implementation phase. The direct greenhouse gas emission reductions are on a case by case scenario, the following:

Project Case	Direct GHG emissions avoided (tCO_2e/year)	Project lifetime (years)	Total avoidance over lifetime (tCO_2)
ALUR	26,544	15	398,160
FAROLUR	16,096	10 (assumed)	160,965
Estancias del Lago	80,482	10 (assumed)	804,825
INC	3,219	10 (assumed)	32,193
TOTAL	**126,341**	--	**1,396,143**

It is worth mentioning that additional GHG emissions reductions will be achieved after the Call for Proposals is done and proposed project ideas are carried out. The expected reductions from these are difficult to calculate on an *ex-ante* basis since data and information on potential projects to be undertaken is not sufficient at this stage.

The baseline and alternative scenarios for each case are:

Case	Baseline	Alternative Scenario	Reduction/Avoidance
ALUR	Wood chips are combusted to generate thermal energy (steam in boiler) and biogas resulting from the anaerobic digestion would be released into the atmosphere.	Biogas is used as energy source to replace wood chips for the same application.	Methane emissions are avoided as CH_4 is combusted in the boiler instead of releasing it to the atmosphere.
FAROLUR	Wood is used to heat process water and the biogas resulting from the anaerobic digestion would be released into the atmosphere.	Biogas is used for thermal energy generation to heat process water.	Methane emissions are avoided as it is used as energy source.
Estancias del Lago	Wood is used as energy source and the biogas resulting from the anaerobic digestion would be released into the atmosphere.	Biogas is used for energy generation.	Methane emissions are avoided as it is used as energy source.
INC	Anaerobic lagoons would be used to treat waste, thus emitting CH_4.	Composting – emits CO_2 instead of CH_4	Methane emissions are avoided because waste is composted instead of anaerobically digested.

Assumptions made and data obtained to estimate emissions reductions on a case by case basis are:

ALUR:

- Data used to estimate avoided methane emissions:
  a) Volume of biogas generated: 21,703 m^3/day
  b) Percentage of CH_4 content in the biogas: 52%
  c) Operational days per year: 160 days
  d) Average CH_4 density: 0.7 kg/m^3
  e) Global warming potential of CH_4 is 21 tCO_2e/tCH_4

- Assumptions made:
  a) Only methane avoidance is accounted for since previous form of steam generation was already CO_2 neutral.
  b) Biogas replaces wood chips to generate steam in a boiler and the methane contained in the biogas is combusted (project) instead of being released to the atmosphere (baseline).

FAROLUR:

- Data used to estimate avoided methane emissions:
  a) Volume of biogas generated: 6,000 m^3/day (2,500 cows, 10 tons of manure per day)
  b) Percentage of CH_4 content in the biogas: 50%
  c) Operational days per year: 365 days
  d) Average CH_4 density: 0.7 kg/m^3
  e) Global warming potential of CH_4 is 21 tCO_2e/tCH_4

- Assumptions made:
  a) Only methane avoidance is accounted for since previous form of steam generation was already CO_2 neutral.
  b) The plant operates every day.
  c) Biogas replaces wood chips for energy generation and the methane contained in the biogas is combusted (project) instead of being released to the atmosphere (baseline).
  d) 10 years lifetime was assumed.

ESTANCIAS DEL LAGO:

- Data used to estimate avoided methane emissions:
  a) Volume of biogas generated: 30,000 m^3/day (approx. 19,300 cows)
  b) Percentage of CH_4 content in the biogas: 50%
  c) Operational days per year: 365 days
  d) Average CH_4 density: 0.7 kg/m^3
  e) Global warming potential of CH_4 is 21 tCO_2e/tCH_4

- Assumptions made:
  a) Only methane avoidance is accounted for since previous form of steam generation was already CO_2 neutral.
  b) The plant operates every day.
  c) Biogas replaces wood chips for energy generation and the methane contained in the biogas is combusted (project) instead of being released to the atmosphere (baseline).
  d) 10 years lifetime was assumed.

INSTITUTO NACIONAL DE COLONIZACIÓN (INC):

- Data used to estimate avoided methane emissions:
  a) Volume of biogas generated: 1,200 m^3/day (500 cows, 2 tons of manure per day)
  b) Percentage of CH_4 content in the biogas: 50%
  c) Operational days per year: 365 days
  d) Average CH_4 density: 0.7 kg/m^3
  e) Global warming potential of CH_4 is 21 tCO_2e/tCH_4

- Assumptions made:
  a) All the manure that used to be treated under anaerobic conditions is treated under aerobic conditions in the project scenario (composting).
  b) Methane was previously released into the atmosphere (baseline) in the biogas generated in the anaerobic treatment.
  c) 10 years lifetime was assumed.

Indirect Emissions Reductions:

Project Case	Indirect bottom-up GHG emissions avoided (tCO_2e/year)*
ALUR	796,320
FAROLUR	482,895
Estancias del Lago	2,414,475
INC	96,579
Total	**3,790,269**

**during the first 10 years while the plants operate simultaneously.*

The assumptions made for each of the cases are explained below.

Bottom-up approach:

- ALUR: the replication factor applied is 2. In this specific case, the replication factor was selected based on the fact that there are limited probabilities of installing additional bioethanol plants in Uruguay (though not in the region) and therefore of using vinasse as energy source.
- FAROLUR, Estancias del Lago and INC: the selected replication factor is 3 for all the cases. There is potential for market transformation as the same type of projects can be highly replicated in other parts of the country. This is applicable to small, medium and large dairy facilities. It is expected that with the conduction of this project, several barriers will be removed thus having a positive effect on the market.

Additional environmental benefits triggered by the Project

There are other indirect environmental benefits that would be generated by the implementation of this project, namely:

1. Soil and water pollution will be reduced due to the application of better treatment technologies,
2. The generation of solid waste to be disposed of in landfills will be less thus increasing landfills lifetime and reducing the emission of other gases apart from GHG, and
3. Demand for raw materials will be reduced as recycling, reuse and valorisation of waste increases.

A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:

Risks	Impact on the Project	Likelihood	Risk Description and Mitigation Actions
1. National political support for environmental control measures, waste valorisation initiatives, and renewable energies decreases.	High	Low	If national support for the types of measures directly related to the project decreases, this can have a negative impact on improvements of the policy and regulatory framework, which would also make small farm holders reluctant to adopt the new technologies promoted by the project. *Probability*: this scenario is not likely to happen as the Government of Uruguay is committed to become a competitive player in the agriculture and farming sectors, for which cleaner production methods and environmental control are key. Moreover, the use of domestic, renewable energy sources is a key pillar in Uruguay's energy policy. Given the political stability in the country, it is unlikely that this context would change and affect the implementation of the Project.

2. The political context changes in the country and the revolving fund is not implemented	High	Low	The establishment of the fund, which will start operating after project closure, will be conducted by the Government of Uruguay and thus changes in the political, economic and social framework conditions of the country may affect the implementation of the fund. *Probability*: The Government of Uruguay has shown consistency in implementing environmental commitments throughout different administrations and previous revolving funds have been established successfully, therefore the likelihood is low. Moreover, the National Energy Policy ("Uruguay 2030"), which sets goals up until 2030 has been agreed by all parties.
3. Private companies would prove not willing to implement advanced, low carbon emission waste valorisation technologies.	Moderate	Moderate	If the envisaged private companies are not willing to implement the planned demonstration projects then the solution would be to look for alternative private companies in Uruguay that would be willing to do it, which would delay project execution. *Probability*: Some large companies have taken a proactive approach and recognize the added value of having more sustainable, cleaner production chains. In the short term, i.e. the timeframe of the Project, only proactive enterprises are expected to apply certain technologies, and the successful demonstration of a number of pilot facilities is expected to greatly reduce the perceived risks and create confidence amongst the rest of the companies. In the medium- and long-term, policy measures, enforcement of regulations, technical assistance and financial incentives will be crucial for further market development. Moreover, a Project Advisory Committee compromised of representatives from the private sector, the financial sector, associations, academia and any other relevant stakeholder group will be set up to provide technical inputs and guidance to the Project Steering Committee on a regular basis.
4. The utilisation of agricultural and agro-industry waste for energy, fertilization and by-product generation would prove technically unsuccessful in the Uruguayan context.	Moderate	Moderate	If the selected technologies prove to be not efficient in the targeted production chains under the Uruguayan context, the mitigation action to be applied to future projects or to the present project would be to change to other technologies. This could be financially complex as additional financing would be required. The impact would be moderate as it would only affect the demonstration of the technology's viability in the selected facility. *Probability*: This scenario is not likely to happen, provided the fact that an appropriate capacity building on how to operate the waste treatment system is in place and also because the selected technologies have been successfully applied in other countries.
5. The use of waste for energy purposes would prove economically unsuccessful in the Uruguayan context	Moderate	Moderate	Investments in new technologies made by the end-user can be financially unrewarding in certain contexts. If a technology proves to be not financially attractive under the current circumstances, other technologies could be analysed in the future. Moreover, different projections can be made using different scenarios, such as varying energy and oil price fluctuations.

			Probability: The likelihood of this risk has been assessed as moderate due to the uncertainties associated to financial mechanisms or incentives that could be available for farmers.
6. Waste streams vary as a consequence of climate change impact on the region	High	Low	Waste streams can suffer modifications in terms of volume and composition due to climate change effects in Uruguay, such as higher frequency of storms or draughts. Probability: the likelihood of this risk has been assessed as extremely low in terms of the Project's lifetime (4 years). Climate change would take more time to cause a significant impact on the environment and thus on the waste streams.

A.7. Coordination with other relevant GEF financed initiatives

1. The World Bank/GEF "Energy Efficiency Project" (GEF ID# 1179): as explained in section A.5., this project's intends to increase the demand for and competitive supply of energy-efficient goods and services, contributing to: (a) improved efficiency in energy use; (b) reduced reliance of the Uruguayan economy on imported electricity and fuels; and (c) reduced emissions from the energy sector. The Uruguayan Saving and Energy Efficiency Trust (FUDAEE) was created with the aim of providing funding for technical assistance in energy efficiency, promoting energy efficiency nationwide, financing energy efficiency projects' implementation, promoting research and development in energy efficiency and acting as a contingency fund in crisis junctures of the energy sector. The fund that is planned to be set up under the proposed Project will be modelled on FUDAEE and benefit from the lessons learnt hereunder.
2. The UNDP/GEF "Uruguay Wind Energy Programme (UWEP)" (GEF ID# 2826): the project, which is currently being finalized, has generated important regulatory instruments to stimulate the integration of renewable energy sources that may prove beneficial for waste-to-energy production as well. The proposed Project will limit its scope to those issues that require further enhancement.
3. The UNDP/GEF "PROBIO - Electricity Production from Biomass in Uruguay" (GEF ID# 3144): the project focuses on decentralized electricity generation using biomass as an energy source but limited to the treatment of biomass resources from the forestry sector. The project has recently started and will address policy and knowledge barriers, and will develop business models for private operators. Biomass (forestry) resources will be mapped using GIS technology. Synergies with the proposed Project will be explored, especially with respect to overcoming knowledge barriers and the development of business models.
4. The GEF Small Grants Program: the experiences gained and information generated (e.g. in the form of reports) under this programme, particularly in relation to the implementation of effluent treatment systems in small dairy farms as well as several other relevant areas, will be utilised by the proposed Project and opportunities for collaboration explored.

Overall, these experiences gained under the above projects will be used to provide inputs with respect to lessons learnt and best practices for the execution of the proposed Project.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B.1 Describe how the stakeholders will be engaged in project implementation:

The GEF Implementing Agency for the Project will be UNIDO. The executing counterpart will be the Ministry of Industry, Energy and Mining (MIEM) via the DNE (National Energy Directorate), along with the Ministry of Housing, Territorial Planning and Environment (MVOTMA) via the DINAMA (National Environment Directorate) and the Ministry of Agriculture, Livestock and Fishery (MGAP).

In order to ensure the efficient and effective management of the whole project the following activities are envisaged:

Main Activities to be conducted	Responsibility of / stakeholders involved
1) Convene the Steering Committee (SC) responsible for project coordination and execution	DNE (MIEM), DINAMA, MGAP, UNIDO
2) Selection of a Project Coordinator	Steering Committee
3) Establishment of a Project Management Unit (PMU) and selection of members	Steering Committee
4) Day to day coordination, management and monitoring of all project activities	PMU - Project Coordinator
5) Engagement of Strategic Partners when necessary	PMU – Project Coordinator

The project will be managed at two different levels:

- Institutional level
- Project level

Each level implies the involvement of different stakeholders who are engaged in the execution of the project and have different responsibilities and/or share several activities. The following figure shows schematically how the stakeholders relate with each other on the two levels:

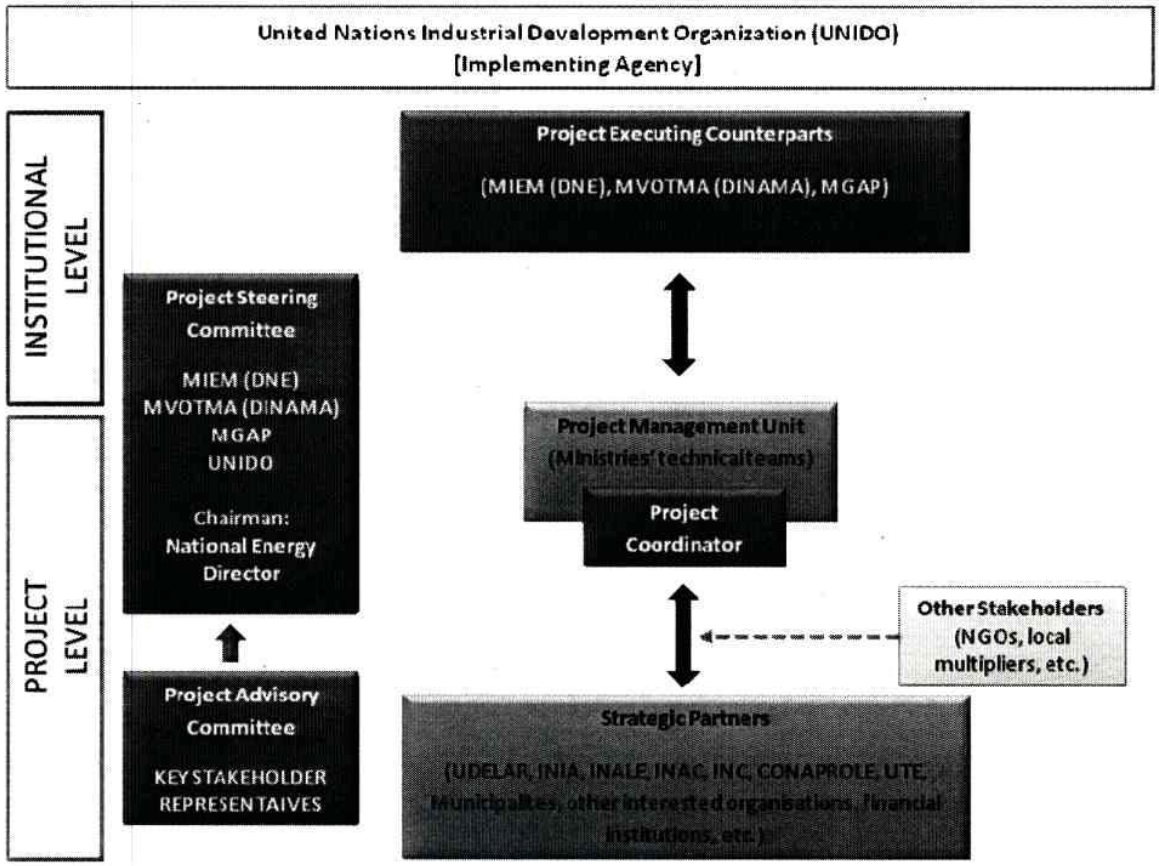

FIGURE 6: INSTITUTIONAL ARRANGEMENT FOR THIS PROJECT

The specific responsibilities of each involved party are described as follows:

Project Steering Committee:

The **Steering Committee** is composed of the three ministries / ministerial directorates (DNE, DINAMA, and MGAP) and UNIDO's Regional Office in Uruguay. The Secretariat of the Steering Committee will be located at Montevideo, Uruguay. The DNE will act as focal point and will be responsible for the overall daily project management, monitoring of activities and planning, making sure that everything flows as scheduled.

The Steering Committee will be chaired by the National Energy Director and will meet on a biannual basis. The responsibilities of the Steering Committee include:

1. Revision and approval for annual work plans;
2. Revision and approval of annual GEF reporting (PIRs);
3. Revision and approval of annual budgets;
4. Monitoring of Project progress;
5. Providing guidance on strategic issues and activities;
6. Appointing the Project Coordinator;
7. Select the members of the Project Management Unit (PMU);
8. Supervise the PMU.

Specific roles to be undertaken by each of the stakeholders that are part of the SC:

- **DNE:** apart from being part of the Steering Committee, it will execute some of the activities. It will be responsible for keeping the project up to schedule and to develop specific initiatives in accordance to the project objectives. The Chairman of the SC will be provided by DNE. Moreover, the in-kind support from the Ministry of Industry, Energy and Mining (MIEM), which is channelled through DNE, consist of hosting the project management unit (PMU), coordination with government partners, the provision of office space and technical inputs by DNE staff.
- **DINAMA:** it will coordinate project activities along with the DNE and the MGAP. It will be represented by a person in the Steering Committee. The Ministry of Housing, Territorial Planning and Environment (MVOTMA) will provide in-kind support through DINAMA in the form of office facilities, technical input, human resources and information databases related to undertakings within the scope of this project.
- **MGAP:** it will coordinate project activities along with the DNE and the DINAMA. It will be represented by a person in the Steering Committee. The Ministry of Agriculture, Livestock and Fishery (MGAP) will provide in-kind support in the form of human resources, office facilities, information and databases related to undertakings within the scope of this project.
- **UNIDO:** it will oversee the implementation of the project. It will be represented by a designated UNIDO staff member in the Steering Committee.

Further to the above, the three ministries / ministerial directorates will focus on the following roles:

MINISTERIAL DIRECTORATE	ROLE
DNE – responsible for developing, putting forward and coordinating policies to meet the national energy needs.	DNE will actively contribute to all outcomes. With respect to outcome 1., it will collaborate with the other actors in the development of the policy framework as part of the working group; DNE holds a key role in the area of energy (biogas production and use of biogas, synthetic diesel production, use of manure for combustion, etc.). DNE's participation will be critical for the development of an action plan for the removal of financial barriers and establishment of financial instruments for low-emission waste valorisation technologies as well as the identification of financial institutions for the up-scaling of technologies once the project has been completed. Furthermore, DNE will engage in the process of developing new policies / regulations draft and/or revising existing ones. With respect to outcome 2., DNE will provide information on demand and supply of energy in the country, which will be fundamental for the prefeasibility studies to be carried out in the prioritized sectors. The data will help to assess e.g. what is the best business model and possible target for the

	generated energy for those cases, where energetic valorization of the waste is considered its best use. With respect to outcome 3., specifically with regards to the Call for Proposals, DNE can build on the knowledge gained from previous calls for other projects as well as contribute knowledge on topics such as energy costs and installations for electricity generation, amongst others. With respect to outcome 4., DNE will actively participate in the dissemination campaign and the strengthening of capacities.
DINAMA – responsible for the adequate protection of the environment	DINAMA will actively contribute to all outcomes. With respect to outcome 1., it will collaborate with the other actors in the development of the policy framework as part of the working group; DINAMA holds a key role regarding the establishment of regulatory criteria for environmental impacts stemming from waste valorisation activities, e.g. from the use of manure for combustion or the application of biofertiliser to soil, etc. Furthermore, DINAMA will participate in the development of new policies / regulations draft and/or the revision of existing ones, especially from an environmental viewpoint. With respect to outcome 2., the information available at DINAMA (flow, organic load, quantity of nutrients and other parameters of industrial effluents which are reported in environmental operation reports, waste management plans, etc.) will be fundamental to achieving the proposed outputs. Within DINAMA, registries with the results from effluent analyses undertaken during inspections (which form part of DINAMA's control programme) exist. Furthermore, DINAMA also has records on feedlots, including data for the number of animals, operational capacity, occupancy rate, treatment of effluents (if any), etc. With respect to outcome 3., specifically with regards to the Call for Proposals, DINAMA will evaluate whether the submitted projects meet existing and soon to be established environmental requirements and may also evaluate the environmental impacts resulting from the proposed activities. With respect to outcome 4., DINAMA will actively participate in the dissemination campaign and the strengthening of capacities.
MGAP – responsible for the ongoing development of the agricultural and agro-industrial sectors	MGAP will actively contribute to all outcomes. With respect to outcome 1., it will collaborate with the other actors in the development of the policy framework as part of the working group; MGAP holds a key role regarding aspects related to the use of soils and agricultural activities such as e.g. the use of manure for combustion and the application of biofertiliser to soil. Furthermore, MGAP will contribute to the development of new policies / regulations draft and/or the revision of existing ones, especially with regards to aspects related to soil management, agricultural and agro-industrial sectors, etc. With respect to outcome 2., especially for the waste mapping (output 2.1.), MGAP has up-to-date information for the livestock sector in the country as it carries out periodic inspections of the relevant establishments. With respect to outcome 3., specifically with regards to the Call for Proposals, MGAP plays an important role in the review of proposals from enterprises form the livestock sector, the control of which primarily lies with MGAP. Hence MGAP has a greater quantity of data on those. Also proposals for waste treatment which involve the use of soil will be considered by MGAP. With respect to outcome 4., MGAP will actively participate in the dissemination campaign and the strengthening of capacities.

A Project Advisory Committee will be set-up comprised of representatives from the private sector, the financial sector, associations, academia and any other relevant stakeholder group to provide technical inputs and advice to the Project Steering Committee on a regular basis. Thus it is to be assured that particularly the private sector perspective is fully considered during project implementation.

Project Management Unit:

As already mentioned, the SC will establish a Project Management Unit (PMU) and will select its members. The PMU will be responsible for the project at local level and will be the main point of contact for government institutions and organisations. The PMU will also be responsible for elaborating a Work Plan (POA). All PMU members, which will encompass at least a national Project Coordinator, will be either national consultants (Uruguay) or seconded from the national counterparts (ministries / ministerial directorates), unless otherwise agreed, and will be based in Montevideo. The Project Coordinator will be responsible for the day-to-day management and supervision of the project, including overall technical aspects of the project, the coordination of contracting (consultants, sub-contracts) and monitoring activities. He will be supported by a Project Assistant as well as technical staff. All staff shall satisfy the selection criteria described in the Terms of Reference (TOR) to be developed and be hired using the Project's GEF and co-financing resources (DNE/DINAMA/MGAP).

The PMU will be responsible for coordinating the communication and dissemination of the project results, lessons learned and success stories that are important for the sustainable and future development of the involved market sectors in Uruguay.

Strategic Partners:

Several organisations will be engaged at different stages of project execution in order to provide and/or share specific experiences and knowledge and to participate in the project's activities.

The large-scale undertakings will be constructed under the responsibility of the respective companies (ALUR, FAROLUR, Estancias del Lago), who will be the owners and operators of the waste valorisation plants and will bear the investment costs. The INC will be in charge of managing the project in El Porvenir; in particular, INC will be responsible for contracting and organising the activities with the farmers. The four partners were selected by the Government of Uruguay on the basis of the benefits the proposed undertakings can contribute to the overall project, especially in terms of technologies employed and potential for capacity building. While the entities display quite different characteristics (e.g. in terms of size), they were chosen for their specific technological undertakings and capacity as well as experience of the entity to implement these. The undertakings hold either great potential for replication, are highly innovative (e.g. in terms of the business model applied) and/or provide a platform for future capacity building (e.g. in the form of a Learning and Training Centre). Further details on each of the four waste treatment undertakings can be found in Annex M.

The smaller-scale projects will be implemented via a Call for Proposals, hence the respective companies are not known at this stage. However, private companies in the agricultural and farming sector and the secondary industries will be direct beneficiaries of the Project as they will provide their facilities to carry out these demonstration projects.

An important role will be played by the national university UdelaR (Universidad de la República Uruguay), mainly through the generation of knowledge as well as by sector organisations such as INALE (dairy farmers – *Instituto Nacional de la Leche*) and INAC (meat packers – *Instituto Nacional de Carnes*), who will be involved throughout the Project to coordinate and implement promotional and technical support activities targeting their stakeholders.

The national cooperative CONAPROLE (dairy sector) will be involved in the implementation of specific project activities, including the provision of support for biogas installations at small farms (demonstration project in conjunction with INC).

Other stakeholders:

With regards to the stakeholders' engagement during the execution of Project Component #4, it is crucial to have the support from local multipliers in addition to the organisations already involved in the project execution to reach as many people as possible. Engagement activities include, but are not limited to:

- Providing information via e-mails, newsletters, publications on the organisations' web pages

- Providing information through radio and/or T.V.
- Providing information through local newspapers and journals

A registry of the people engaged will be kept for monitoring purposes.

An overview of the roles of each of the envisioned stakeholders, which may be directly engaged in the execution of the project, can be found in the below table:

STAKEHOLDER	ROLE
Universidad de la República (UdelaR) - University of the Republic	UdelaR will be an important partner for the project for components 1, 2, 3 and 4, with emphasis on outputs 1.2, 2.2, 3.1, 3.2, 3.4 and 4.6, contributing to the generation of knowledge as well as the research and development activities that will be carried out to start developing stronger technological resources for the country. Within the University of the Republic, Faculty of Engineering, Chemistry and Agronomy will be the most involved institutions in this project.
Instituto Nacional de la Leche (INALE) - National Milk Institute Instituto Nacional de Carnes (INAC) - National Meat Institute Instituto Nacional de Colonización (INC) - National Colonization Institute	INALE, INAC and INC will support the project particularly in component 4, through the coordination and implementation of promotional and technical support activities targeting their stakeholders. INC will also be in charge of one of the demonstration projects supporting output 3.1 and is one of the co-financing partners.
Instituto Nacional de Investigación Agropecuaria (INIA) - National Agricultural Research Institute Laboratorio Tecnológico del Uruguay (LATU) - Technological Laboratory of Uruguay Agencia Nacional de Investigación e Innovación (ANII) - National Agency for Research and Innovation	INIA, LATU and ANII will support the project with emphasis on component 4 by the generation of knowledge as well as in research works and dissemination activities, as well as in components 1, 2 and 3, mainly in 1.2, 2.2 3.1, 3.2 and 3.4.
Cooperativa Nacional de Productores de Leche (CONAPROLE) - National Cooperative of Milk Producers	CONAPROLE will be involved in the implementation of specific project activities, including the provision of support for biogas installations at small farms (demonstration project in conjunction with INC), supporting component 4 and component 3, mainly in output 3.1.
Energy Service Companies (ESCOs)	ESCOs will support especially outputs 3.1, 3.2 and 3.4, providing information from studies made, as well as component 4 through participation in activities that will be developed during the project.
Civil Society / NGOs / etc.	Civil society, NGOs, guilds, trade unions, etc. will be consulted about changes in the policy framework or actions to be taken.
Administración Nacional de Usinas y Trasmisiones Eléctricas (UTE) - National Administration of Power Plants and Electrical Transmissions / Administración Nacional de Combustibles, Alcohol y Pórtland (ANCAP) - National Administration of Fuels, Alcohol and Portland Cement Dirección Nacional de Ordenamiento Territorial (DINOT) - National Directorate of Land Use Planning Director Nacional de Agua (DINAGUA) - National Directorate of Water Dirección Nacional de Artesanías, Pequeñas y Medianas Empresas (DINAPYME) - National Directorate for Crafts, Small and Medium	These institutions will support the project particularly in components 1 and 3 by participating in the development of the policy framework and for specific aspects of the Call for Proposals.

Enterprises and other state institutions	
Financial institutions	The local financial institutions (e.g. banks) will implement the scale up of the technologies after this project is completed supporting particularly component 1.
Instituto Uruguayo de Normas Técnicas (UNIT) - Uruguayan Institute of Technical Standards	UNIT will support the project particularly in component 1 providing information about international standards that can be used to strengthen the policy framework and assist in the development of standards in the prioritized sectors. UNIT will support also component 4 providing information about technical standards.
Cámara de Industrias del Uruguay (CIU) - Uruguayan Chamber of Industry Dirección Nacional de Industrias (DNI) - National Directorate of Industry	The CIU and DNI will support the project particularly in components 2, 3 and 4 providing information about the industrial sectors.

B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

The envisaged Project fits into national strategies to promote cleaner production technologies, enhance sector productivity and competitiveness, preserve natural resources, protect the local and global environment and diversify the energy mix by increasing the share of renewable energies. The Project is expected to deliver tangible socioeconomic benefits for Uruguay in the targeted sectors as a whole and individually for men, women and their families.

The socioeconomic benefits at national level (country) are achieved as a result of the expected economic growth in the targeted sectors. With the inclusion of cleaner technologies and better waste management and treatment activities, environmental impacts derived from their activities would be reduced thus increasing their competitiveness in the international market, which may be translated into growth. Additionally the Project will contribute to reduce economic dependence on fossil fuel imports through strengthening the diversification strategy by increasing the use of renewable energy.

The Project will provide direct technical assistance to identified subsectors, including dairy farmers and factories, cattle farmers for meat production, meat packers, and specific enterprises that can contribute to the reduction of GHG emissions. These will benefit from the Project by acquiring technological know-how to increase the use of renewable energy sources, improve waste management procedures, reduce methane emissions and treat waste and effluents in a more environmentally-responsible way. This technological capital will create opportunities to (i) add value to the product chain and become more successful on the international commodity markets, (ii) reduce the present burden on the environment, water courses and aquifers in Uruguay and La Plata river basin; and (iii) assist producers in the primary sector and industries to become more competitive.

Through the transfer of state-of-the-art technological concepts and process designs, the Project further contributes to the development of a professional sector able to supply environmental services and equipment. As this entails high-quality jobs in the field of agronomy, engineering and consultancy that will lead to the improvement of the technological basis of the country, as local workers will be able to provide high quality services in this field. With regard to the group of small farmers, the Project will contribute to improving their economic position by proving the applicability of biogas technology and providing them with a reliable energy source to replace more costly LPG or electricity. Government organizations consider this impact as highly relevant for this group of farmers and their families.

During the PPG phase, gender-specific issues were looked into. It is expected that social and economic benefits from the implementation of biogas-based energy supply and low carbon technologies will be shared equally by male and female workers in the respective sectors. Direct creation of jobs is an important opportunity that could benefit both men and women. Women often have a predominant role to sustain smallholder economies and therefore the project may benefit those women in this kind of situation.

The Uruguayan government has in-house capacity for evaluating the gender dimension of this Project. Building on the gender analysis of the proposed activities undertaken by UNIDO during the PPG phase, the results of which have been reflected in the activities and outputs described previously as well as integrated into the Project Results Framework (see Annex A), the respective staff will identify and further assess gender-related aspects during project execution to help design gender segregated targets and to propose gender mainstreaming measures, as and if appropriate. They will review communication and training activities to assure that the needs of both women and men are addressed.

B.3. Explain how cost-effectiveness is reflected in the project design:

Bearing in mind that the GEF allocation of resources for this project are USD 3,392,727, the cost-effectiveness of this initiative is estimated at 2.43 US$/ton CO_2eq, considering only the direct GHG benefits over the initiative's lifetime (1,396,143 tCO_2eq).

If the indirect GHG benefits (total 3,790,269 tCO_2eq, bottom-up approach) are included, the cost-effectiveness drops to approximately 0.90 US$/t$CO_2$eq.

C. DESCRIBE THE BUDGETED M &E PLAN:

Project monitoring and evaluation (M&E) will be conducted in accordance with established UNIDO and GEF procedures. The M&E activities are defined by Project component #5 and the concrete activities for M&E are specified and budgeted in the M&E plan (please see the table below). Monitoring will be based on indicators defined in the strategic results framework (which details the means of verification), and the annual work plans. Monitoring and Evaluation will make use of the GEF Tracking Tool, which will be submitted to the GEF Secretariat three times during the duration of the project: at CEO Endorsement, at mid-term, and at project closure.

UNIDO as the Implementing Agency will involve the GEF Operational Focal Point and project stakeholders at all stages of project monitoring and evaluation activities in order to ensure the use of the evaluation results for further planning and implementation.

MONITORING AND EVALUATION PLAN AND BUDGET (INDICATIVE)

Type of M&E activity	Responsible Parties	Budget USD*			Time frame
		GEF	UNIDO	Gov't (in-kind)	
Inception Workshop (IW) and inception report	UNIDO Project Manager (PM); Project Management Unit (PMU)	0	5,000	2,500	Within first two months of project start up
Backstopping by M&E specialist	UNIDO Project Manager (PM); Project Management Unit (PMU); expert consultancy	12,000	0	1,000	As needed
Periodic progress reports and monitoring of project impact indicators (as per LogFrame)	UNIDO Project Manager (PM); Project Management Unit (PMU); Project Steering Committee (PSC); expert consultancy	13,000	30,000	6,500	Semi-annually
Measurement GEF Tracking Tool specific indicators	UNIDO Project Manager (PM); Project Management Unit (PMU); Project Steering Committee (PSC); expert consultancy	5,000	0	0	Mid of project and at project completion
Mid-term evaluation	Independent evaluator for submission to UNIDO Project Manager (PM)	20,000	10,000	0	Mid of project

Type of M&E activity	Responsible Parties	Budget USD*			Time frame
		GEF	UNIDO	Gov't (in-kind)	
Independent terminal project evaluation	Independent evaluator for submission to UNIDO Project Manager (PM)	40,000	15,000	0	Project completion (at least one month prior to the end of the project and no later than six months after project completion)
TOTAL indicative cost		90,000	60,000	10,000	

According to the Monitoring and Evaluation policy of the GEF and UNIDO, follow-up studies like Country Portfolio Evaluations and Thematic Evaluations can be initiated and conducted. All project partners and contractors are obliged to (i) make available studies, reports and other documentation related to the project and (ii) facilitate interviews with staff involved in the project activities.

Legal Context:

The Government of the Eastern Republic of Uruguay agrees to apply to the present project, mutatis mutandis, the provisions of the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government, signed on 12 December 1985 and entered into force on 20 September 1988.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):): (Please attach the Operational Focal Point endorsement letter(s) with this form. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Lic Silvia Fernandez[18]	Advisor on International Relations and Cooperation	MINISTRY OF HOUSING, LAND PLANNING AND ENVIRONMENT	03/01/2012

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	Signature	Date *(Month, day, year)*	Project Contact Person	Telephone	Email Address
Philippe Scholtès Officer-in-Charge Programme Development and Technical Cooperation Division (PTC) UNIDO GEF Focal Point		10/11/2013	Nina Zetsche, Industrial Development Officer, PTC/ECC/RRE, UNIDO 	+43 (1) 26026 3569	n.zetsche@unido.org

[18] Letter of Endorsement was signed by the former Operational Focal Point Mrs. Maria Valeria Perez Guida. The new OFP fully supports the project.

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Results		Indicators	Baseline and Targets	Means of Verification	Assumptions and Risks
Objective					
Transform the different kinds of waste generated in the agriculture and the agro-industry production chains in Uruguay in various types of energy and/or other by-products with the aim of reducing GHG emissions, while contributing to the development of a low carbon sustainable production model supported by an adequate technology development and transfer.		• Quantified reduction and/or avoidance of GHG emissions (in tCO_2e)	**Baseline**: Lifetime tons of CO2eq emissions avoided (equals 0) **Target**: Lifetime tons of CO2eq emissions avoided (1,396,143 tCO2eq)	• GEF climate change mitigation tracking tool	A: Continued support and interest from public and private sector to implement advanced, low carbon emission waste valorisation technologies A: Data to calculate CO2eq emission reductions is available R: Economic, financial or political crisis threaten the sustainability of the Project and prevent the targeted sectors from adopting low-carbon technologies
PC#1: Policy and regulatory framework strengthening					
Outcome 1: The policy framework to promote sustainable production schemes and implement low-emission technologies in prioritized sectors (agricultural and farming sector, processing industries, and small communities) has been strengthened.		• Number of new or revised policies and/or regulations proposed • Number of financial incentives designed	**Baseline**: Insufficient support for waste valorization in place **Target**: Improved policies, regulations and instruments that promote waste valorization.	• Official publications • Final evaluation	A: Government of Uruguay's commitment to improving policy and legislation R: Policies and regulations are not strengthened
Outputs:					
Output 1.1	Establishment of a Taskforce coordinated by DNE/DINAMA/MGAP responsible for preparing strategies in the targeted sectors.	• Operating Taskforce • Number of men and women participating in the Taskforce	**Baseline**: no dedicated taskforce exists. **Target**: establishment of an operative taskforce	• Official documentation e.g. meeting minutes • Members of the Taskforce	A: Commitment from DNE/DINAMA/MGAP to establish the Taskforce R: Lack of personnel to be part of the Taskforce

Output 1.2	Studies have been carried out as inputs for enhancing policy instruments covering at least 10 fields; amongst others, these include: (i) biogas production and uses of biogas; ii) production of synthetic diesel from organic matter; iii) use of dry manure for combustion; iv) production and application of biofertilizers to the soil.	• Number of studies carried out	**Baseline**: insufficient information on the mentioned areas on what issues need to be tackled to enhance the existing instruments. **Target**: Carry out studies covering the 10 areas.	• Project documentation • Appraisals by counterparts	A: Government of Uruguay's commitment to allow for the conduction of the studies R: Limited information to conclude the studies
Output 1.3	Development and implementation of an action plan to remove financial barriers and provide applicable mechanisms and instruments to favor the inclusion and adoption of new low-carbon waste valorisation technologies in the targeted sectors.	• Number of mechanisms and instruments to overcome financial barriers proposed	**Baseline**: no specific plans to remove financial barriers to favor the inclusion and adoption of new low-carbon waste valorisation technologies **Target**: Develop an action plan to favor the inclusion and adoption of new low-carbon waste valorisation technologies	• Action plan • Project documentation	A: Commitment of the government to provide incentives and mechanisms that remove the financial burden R: Political and/or financial context forces the government to reduce the incentives or mechanisms
Output 1.4	Identification and design of financial instrument(s) targeting low carbon technologies for waste valorisation and identification of local financial institutions (e.g. banks) that will implement the scale up of the technologies after this project is completed.	• Number of financial instrument(s) proposed	**Baseline**: no specific financial instrument exists for waste valorization initiatives. **Target**: Design the structure of a financial instrument to be used in the promotion of waste valorization opportunities.	• Project documentation • Appraisals by counterparts	A: Local capabilities to operate the financial instrument are established
Output 1.5	Development of new policy / regulation draft or	• Number of modified,	**Baseline**: Insufficient policy	• Project documentation	A: Taskforce and GoU commitment on

	revision of existing policy / regulation based on the pre-identified areas.	updated and/or new policies and regulations	and regulatory framework to promote waste valorization initiatives in place. **Target**: Establish provisions and guidelines in order to improve the policy and regulatory framework and draft new documents as necessary	• Appraisals by counterparts	collaborating with the drafting of new/revised documents R: Political issues affect the creation and drafting of new/revised regulations and policies.
PC#2: Knowledge base (technological capacities) in the field of waste-to-energy, waste valorisation and low-emission waste treatment technologies strengthened					
Outcome 2: The design and implementation of waste-to-energy valorisation alternatives and low-emission waste treatment technologies have been enhanced due to an improved knowledge base.		• New knowledge resources made available to the public and stakeholders	**Baseline**: Insufficient technological knowledge base in the country **Target**: Improve the technological knowledge base in the country	• Official publications • Final evaluation	A: Commitment of the Government to promote the use of waste-to-energy and waste valorization technologies R: Lack of data to improve the technological knowledge base
Outputs					
Output 2.1	Disaggregated (department level) physical and chemical characterisation of at least the 16 identified waste streams with valorisation potential.	• Number of waste streams characterized • Number of characterized parameters and variables for each stream	**Baseline**: basic characterization of waste streams, which is insufficient for statistics estimation **Target**: Full characterization of at least 16 waste streams	• Project documentation • Laboratory reports	A: State-of-the-art facilities to analyze residues are available to conduct the characterization R: Data is not available, insufficient or not monitored
Output 2.2	Research and prefeasibility studies (including social, environmental and economic dimensions) conducted in the targeted sectors to determine the	• Number of prefeasibility studies conducted	**Baseline**: Lack of comprehensive information on waste valorization processes and business models **Target**: Complete	• Pre-feasibility studies	A: Continued cooperation with national universities R: Universities' support is removed

	most viable waste valorisation processes and business models.		prefeasibility studies in the targeted sectors to fill information gaps		
PC#3: Demonstration of waste valorisation and renewable energy technologies' applications					
Outcome 3: Waste-to-energy and other feasible waste valorization applications have been adopted in the targeted sectors.		• Number of implemented projects in the targeted sectors	**Baseline**: No implementation of novel waste valorization technologies in projects. **Target**: conduction of at least 4 feasibility studies involving waste valorization	• Project reports • Surveys to project owners • Visits to the plants	A: the facilities' owners are committed to promoting and carrying out the demonstration projects R: the projects cannot continue after project finalization due to lack of resources
Outputs					
Output 3.1	Four fully functional large-scale waste treatment plants have been commissioned (digestion of vinasse from bioethanol production, digestion of cow manure from dairy sector, co-digestion of combined waste feedstock in agro-industry and waste treatment and management projects in small size cattle breeding farms)	• Number of fully functional large scale commissioned projects	**Baseline**: No large-scale waste valorization plants are commissioned in the targeted industries. **Target**: 4 fully functional plants are commissioned.	• Projects' feasibility studies and technical design files • Field visits; plant commissioning reports; bill of lading; appraisals by counterparts, final evaluation.	A: Private companies willing to implement advanced, low-emission waste treatment technologies R: Lack of resources can put in danger the continuity of the full-scale projects
Output 3.2	Call for Proposals for and implementation of at least five small to medium scale projects, including (i) design of the call; (ii) feasibility and technical design studies for demonstrations in medium and small sized farms / industries in the targeted sectors; and (iii) implementation of at least five full-scale projects in	• Number of fully functional projects in small- and medium-sized agro-industries	**Baseline**: No innovative waste valorization projects have been implemented in small- and medium-sized agro-industries. **Target**: Implementation of at least 5 waste valorization projects.	• Projects' feasibility studies and technical design files • Field visits; plant commissioning reports; bill of lading; appraisals by counterparts, final evaluation.	A: Private companies willing to implement advanced, low-emission waste treatment technologies R: Delays in the commissioning R: No responses are received after the Call for Proposals.

	medium and small sized agro-industries.				
Output 3.3	Identification of a portfolio of potential waste valorisation projects.	• Number of projects included in the portfolio	**Baseline**: No waste valorization project portfolio exists **Target**: Development of one portfolio with potential projects	• Project documentation • Appraisals by counterparts	A: There will be continuous commitment to promote waste valorization R: Farmers are not interested in participating in the initiative
Output 3.4	Training of personnel on the operation of at least the four large-scale waste treatment undertakings.	• Number of personnel attending the training course, disaggregated by gender • Number of training courses undertaken	**Baseline**: Limited possibilities for training on the operation of waste valorization plants. **Target**: Successful training of at least 1 (one) person per undertaking.	• Project documentation • Appraisal by counterparts and beneficiaries	A: Private companies willing to implement advanced, low-emission waste treatment technologies R: People unable to attend the courses R: Unsuccessful transfer of know-how to the attendees.
PC#4: Capacity building, training and dissemination campaign for the adoption of low carbon waste valorisation initiatives					
Outcome 4: The capacities of sector agents to deliver state-of-the-art sustainable production schemes through sustainable waste management and low-emission treatment technologies in prioritized sectors have been strengthened.		• Number of women/men attending training courses as sector agents • Number of users of the knowledge management platform • Number of people reached by the dissemination campaign	**Baseline**: Insufficient capabilities of the sector agents exist. **Target**: Strengthening of at least 10 sector agents (between women and men) in the field of waste valorization.	• Project documentation • Publications • Training materials	A: There is a critical amount of stakeholders and public in general committed to promote low-emission residues treatment technologies R: Lack of interest and/or willingness of stakeholders in knowing about these new technologies
Outputs					
Output 4.1	A running web-based knowledge management platform has been set up.	• Number of online users that accessed the knowledge management platform	**Baseline**: No dedicated web-based tool for information sharing in place. **Target**: Have one on- line knowledge management platform running	• Project documentation • Web-based platform	A: Access to internet R: Insufficient access to internet or slow connections or webpage unavailability

Output 4.2	Creation of at least (i) 2 toolkits and (ii) 2 training courses: (i) Toolkit on identification of waste valorisation project opportunities and technological options, and toolkit on financing waste valorisation opportunities and applying successful business models; and (ii) Training course on identification of waste valorisation project opportunities and technological options, and training course on financing waste valorisation opportunities.	• Number of toolkits per knowledge area created • Number of training courses per knowledge area created • Number of users subscribing to the training courses, disaggregated by gender	**Baseline**: No publicly available information exists on the waste valorization field and no training courses held on the waste valorization field **Target**: Have at least 2 toolkits on the waste valorization field available on the platform and design and delivery of at least two training courses	• Project documentation • Web-based platform • Training course participants' list	A: People are interested in several subjects that justify the creation of a toolkit and there will be enough people interested in the courses R: There are not enough people interested in attending the course, and/or the course is not held
Output 4.3	Establishment of a network between different productive sectors to ensure the sustainability of the knowledge management platform after the project is completed.	• Number of individual members of the network, disaggregated by gender • Number of member organizations *(no gender disaggregation applies here)*	**Baseline**: No network involving productive sectors to ensure the sustainability of the knowledge management platform. **Target**: Establish one network	• Project documentation • Appraisal by counterparts	A: The knowledge management platform has been successfully established and is operational
Output 4.4	Dissemination campaign and a dissemination workshop to promote waste-to-energy, waste valorization and low-emission waste treatment activities to increase their adoption by farmers, industries and communities.	• Number of dissemination products designed Type of audience reached (e.g. farmer, industry, other), disaggregated by gender (where feasible	**Baseline**: No dissemination programme is established for the promotion of waste valorization. **Target**: One dissemination campaign and one dissemination workshop have been created.	• Project documentation • Dissemination campaign plan • Publications • Workshop proceeding	A: Government is committed to supporting the dissemination campaign and workshop R: The campaign and workshop do not reach the desired stakeholders
Output 4.5	Generation of knowledge about the waste	• Number of additional	**Baseline:** Initial interactions between	• Knowledge Platform	A: Universities are willing to collaborate

	valorisation field through the collaboration with universities.	documents and research conducted with universities' support	UDELAR and one of the private companies have taken place. **Target:** Generate a systematic collaboration between private companies and universities to improve knowledge exchange in the field	• Universities	with the project R: Information is unavailable and/or there is a lack of resources to generate new information

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

STAP comment raised during PIF review		Answer to the comment
1	***Rationale:*** *In this largely agricultural economy, organic wastes have been of limited value and disposed of by the cheapest methods (disposal to land or in waterways without treatment). Recent intensification of agro-industrial processes has encouraged some improvements to waste treatment practices but much remains to be achieved. Small municipal solid waste schemes are also supported by the project. If a value could be placed on these waste biomass materials for use as energy feedstocks, environmental benefits and economic gains at the local and national levels could be achieved. Bioenergy from forest residues and bagasse is already utilised for heat and power production. Many other opportunities exist for farmers and food processing industry to utilise the biomass wastes and hence avoid disposal costs. STAP suggests consideration of opportunity costs of biomass resources.*	The opportunity cost of biomass resources will be estimated during the execution of the Project when detailed studies will be carried out. Many factors need to be considered in the determination of the actual costs and only with actual project information is it possible to do so. The information will be generated during the execution of project component 3. (See Section A.5, Description of project components, Project Component #3 for details)
2	***Barrier removal:*** *Few bioenergy/ biogas plants exist in Uruguay so demonstration plants will be useful to increase knowledge and encourage replicability. Training is a key component for success. Integrating electricity into the grid (when not fully used on site) could become an issue and should be considered during project preparation.*	All the projects to be undertaken in this proposal include a training exercise for those who will operate the waste valorisation plants in order to guarantee their successful management, monitoring, operation and maintenance. A knowledge management platform will also be established as part of the Project to share information and experiences on waste valorisation. In those projects where some electricity injection to the grid is likely to be included, the specific requirements established by local regulations with regards to connecting new energy to the grid will be considered as part of the technical feasibility studies. Moreover, Uruguay is carrying out a distributed energy generation project that could serve as an example and source of information regarding the most important aspects of integrating renewable energy generation to the grid. The project is known as *Projeto-Piloto de geração elétrica sustentável a partir de fontes primárias de biogás e eólica no Departamento de San José – Uruguai*, developed by Itaipu Binacional and PTI (Parque Tecnolpgico Itaipu) Comment addressed under Section A.5, Description of project components, Project Component #3 and #4.
3	***Baseline:*** *Government initiatives to reduce pollution from waste disposal exist, supported by international finance. However, more effort is required and stronger regulations are needed and those have to be complemented by financial incentives. The GEF project*	The proposed Project addresses not only the technological barriers but also the policy and regulatory framework barriers, the financial barriers and the knowledge and capacity building barriers. Further descriptions of each can be found in the document

	aims to overcome technological barriers, though it is difficult to separate these from the other barriers so policy guidance should also be addressed by project proponents. Designing and manufacturing hardware locally is one of the project aims, though it may be possible that suitable equipment already exists and could be easily imported in the short term. This may be the appropriate option for specialist components such as pumps, boilers or generators. STAP recommends exploring further these opportunities.	(section A.4). The policy and regulatory aspects are specifically addressed in Project Component #1 where a discussion and improvement of the existing financial mechanisms is proposed, along with the development and/or modification of the current policies and regulations that govern the existing mechanisms. The specific financial, policy and regulatory barriers to be tackled are described in section A.5. In order to promote the use and the local manufacturing of technologies, an appropriate policy and financial framework that encourages the demand for these technologies in Uruguay needs to be present thus creating the enabling conditions for a local market. (see also Annexes L and J).
4	***Demonstration plants**: Two of the proposed plants are for treatment of manure/effluent from large dairy herds. Need for two similar demonstration projects could be considered. How will they differ and are they representative? Treatment of effluent from biofuel processing plants is widely undertaken elsewhere â€" have these overseas plants been evaluated? The 4th proposal relates to smaller dairy farms. With this mix, consideration should be given to replacing one large dairy farm demonstration with a food processing option that represents what could be achieved by this industry sector. Upgrading the biogas produced to biomethane more suitable for use in internal combustion engines has not been covered in the proposal. Has it been integrated into plant designs and included in the investment costs?* *It is not clear why pilot plants have been suggested. Normally these are useful to prove a new technology prior to scaling up to full commercial-scale. The technologies proposed here are mature, even though they have not been used in Uruguay. So from the technical perspective, given the plant suppliers will probably be from elsewhere, they should be able to advise on plant operation after construction, thereby eliminating the need for pilot plants.*	The plants differ in the following aspects: 1. *FAROLUR* project will valorise and biodigest cow manure only. 2. *Estancias del Lago* project will treat feedstock composed of cow manure, animal food residues (soybean, corn), glycerol from the biodiesel plant, wastewater from the powdered milk production plant, and possibly waste from surrounding industries and organic domestic waste from Durazno City. The technology to be applied is Mesophilic Complete Mix Reactors. The mixture of different feedstock is known as "co-digestion". Therefore it is necessary to do the two demonstration projects as they represent two different situations. Different feedstock composition means that different valorisation options can be applied; and this includes the pre-treatment, the biological treatment, and the digestate conditioning for final application/disposal. Moreover, they applied different technologies. Upgrading biogas to biomethane means treating it until it reaches characteristics similar to those of fossil-origin natural gas. This option has not been considered in the initial project conception but will be considered as part of the studies that will be carried out throughout the project. The biogas produced in the treatment system will be cleaned (removal of humidity and other undesirable components) can be used for generation of thermal energy and electricity by means of technologies different from internal combustion engines. The objective of including these plants is to learn how to design, install, operate and monitor new technologies for waste valorisation by means of having the direct experience on site and will benefit and encourage the generation of a local market. The goal of the Government of Uruguay is to generate local capacity and

		knowledge so these initiatives can be replicated in other parts of the country in the future. These demonstrative projects can pave the way for this goal to be achieved as they will try to show that the technologies that work overseas can successfully be deployed in Uruguay too and that local human resources are capable of managing them as well. Please refer to Annex L *Report– Waste-to-Energy technologies and knowledge base* and Annex J– *Waste expert.* These comments are mainly addressed in Project Component #3 and by means of the creation of the Knowledge Platform mentioned in PC#4.
5	***Climate change abatement:*** *The direct GHG savings are modest but must be linked with the other significant environmental benefits resulting as well as the improved social issues anticipated.* *Note: A recent FAO report "Energy-Smart Food for People and Climate" is relevant in the context of this project:* *http://www.fao.org/docrep/014/i2454e/i2454e00.pdf*	The other significant environmental benefits are addressed in Annex I along with the Global Environmental Benefits. The additional environmental benefits brought by the project are related to: soil, air and water pollutants reduction, reduction in raw materials demand and energy, reduction in diseases spread by means of improving waste management techniques. With specific regard to energy consumption in the food chain, this project contributes to reducing it as the energy generated in some of the waste valorization projects will be self-consumed thus reducing energy demand from conventional sources (fossil fuels and grid).

	Review comment raised during PIF review	Answer to the comment
	DER, March 22, 2012. *a) We would like to see strong investigation of the use of non-grant instruments.* *b) We would like to see component 1 strengthened to include elements that address financial incentives for wasteto-energy applications.* *DER, April 11, 2012.* *a & b) These items are proposed in the PPG and will be reviewed at CEO endorsement. Also, please provide explanation for how the revolving fund will be established and supported during and after the project.* *c) Please ensure implementation of the GEF visibility guidance.* *d) Please also ensure sufficient technical and cost analysis of the incremental benefits of the GEF activities are documented and presented at CEO endorsement.*	a & b) The Government of Uruguay (GoU) has previous experience in implementing financial instruments in relation to GEF projects, which are the Energy Efficiency Trust (FEE) and the Uruguayan Savings and Energy Efficiency Trust (FUDAEE) (further information can be found in Section A.5. of this document). The national counterparts have therefore requested that a financial instrument (most likely a revolving fund) is designed and structured during the project that will start operating after project closure. The procedure for capital rising will be decided during project execution, based on the country's previous experience in projects of this sort. Moreover, based on the GoU's experience with the establishment of financial instruments plus the lessons learnt from the mentioned GEF projects, it is envisaged that the GoU will successfully make available the necessary financial resources that will support the development and up-scaling of new waste valorization projects that will result from Project Component #3. c) Full compliance with the GEF Communication and Visibility Policy will be ensured during project implementation especially as part of the activities planned under Project Component #4. d) During the PPG, the costs analysis to calculate the incremental benefits has been based on information provided by the companies hosting the full-scale projects. Please see Annex M for further information.

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[19]

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF: **USD50,000**			
Project Preparation Activities Implemented	***GEF/LDCF/SCCF/NPIF Amount ($)***		
	Budgeted Amount	***Amount Spent Todate***	***Amount Committed***
1.Analysis of the regulatory and policy framework focusing on low-emission technologies (e.g. in the waste-to-energy sector)	3,000	2,934	0
2. Preliminary mapping of waste sources and pre-identification of technological alternatives for energy production and other forms of waste valorisation, and preliminary analysis of the state-of-the-art of these technologies.	15,000	12,128	0
3. Workshop on technological opportunities for waste to energy production and other forms of waste valorisation, low-emission waste treatment, with participation of international experts and local stakeholders.	11,000	5,186	5,500
4. Detailed assessment of needs for technological inputs (training, laboratory facilities and equipment).	8,000	4,972	0
5. Analysis of existing financial barriers for deployment of low-emission technologies and identification of potential non-grant instruments in order to enhance private sector engagement and increase market penetration of waste to energy low-emission technologies.	5,000	0	2,794
6. Preliminary technical specification of first envisaged full-size investments and industry-scale pilot plants.	8,000	7,117	0
7. Preparation and finalization of full-sized project document for submission to GEFSec.	0	0	0
Total	50,000	32,337	8,294

[19] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)

N/A

ANNEX E: BUDGET ALLOCATION

Project Components	Indicate whether Inv or TA	Expected Outcomes	Expected Outputs	UNIDO Budget Lines		GEF Financing	Co-Financing	Total ($000)
				Code	Description	$000	$000	c=a+ b
						a	b	
Policy and regulatory framework strengthening	TA	1. The policy framework to promote sustainable production schemes and implement low-emission technologies in prioritised sectors (agricultural and farming sector, processing industries, small communities) has been strengthened.	1.1 Establishment of a taskforce coordinated by DNE/DINAMA/MGAP responsible for preparing strategies in the targeted sectors.	11	Int'l consultant	10.00	0.00	70.00
				17	Nat consultant	13.00	25.00	
				21	Sub-contract	0.00	0.00	
				30	Workshop/ Study tour/ Training	6.00	10.00	
				51	Sundries	1.00	5.00	
			Sub-total			30.00	40.00	
			1.2 Studies have been carried out as inputs for enhancing policy instruments covering at least 10 fields; amongst others, these include: i) biogas production and uses of biogas; ii) production of synthetic diesel from organic matter; iii) use of dry manure for combustion; iv) production and application of biofertilizers to the soil.	11	Int'l consultant	60.00	10.00	370.00
				17	Nat consultant	80.00	110.00	
				21	Sub-contract	70.00	0.00	
				51	Sundries	10.00	30.00	
			Sub-total			220.00	150.00	
			1.3 Development and implementation of an action plan to remove financial barriers and provide applicable mechanisms and instruments to favour the inclusion and adoption of new low-carbon waste valorisation technologies in the targeted sectors.	11	Int'l consultant	20.00	20.00	160.00
				17	Nat consultant	30.00	50.00	
				21	Sub-contract	20.00	20.00	
			Sub-total			70.00	90.00	
			1.4 Identification and design of financial instrument(s) targeting low carbon technologies for waste	11	Int'l consultant	15.00	15.00	100.00

			valorisation and identification of local financial institutions (e.g. banks) that will implement the scale up of the technologies after this project is completed.	17	Nat consultant	35.00	35.00	
				21	Sub-contract	0.00	0.00	
			Sub-total			50.00	50.00	
			1.5 Development of new policy / regulation draft or revision of existing policy / regulation based on the pre-identified areas.	11	Int'l consultant	44.73	0.00	289.73
				17	Nat consultant	75.00	95.00	
				21	Sub-contract	0.00	15.00	
				51	Sundries	5.00	55.00	
			Sub-total			124.73	165.00	
			Sub-total - PC 1			**494.73**	**495.00**	**989.73**
						49.99%	50.01%	
2. Knowledge base (technological capacities) in the fields of waste-to-energy, waste valorisation and low emission waste treatment technologies strengthened	TA	2. The in-country technological knowledge base to design and implement waste-to-energy valorisation alternatives and low-emission waste treatment technologies has been enhanced.	2.1 Disaggregated (department level) physical and chemical characterisation of at least the 16 identified waste streams with valorisation potential.	11	Int'l consultant	10.00	0.00	315.00
				17	Nat consultant	60.00	90.00	
				21	Sub-contract	80.00	40.00	
				51	Sundries	5.00	30.00	
			Sub-total			155.00	160.00	
			2.2 Research and prefeasibility studies (including social, environmental and economic dimensions) conducted in the targeted sectors to determine the most viable waste valorisation processes and 'business models'.	11	Int'l consultant	40.00	15.00	495.00
				17	Nat consultant	80.00	120.00	
				21	Sub-contract	100.00	60.00	
				30	Workshop/ Study tour/ Training	20.00	60.00	
			Sub-total			240.00	255.00	
			Sub-total - PC 2			**395.00**	**415.00**	**810.00**
						48.77%	51.23%	
3. Demonstration of waste valorisation and renewable energy	Investment	3. Waste-to-energy and other feasible waste valorisation applications have been adopted in the targeted sectors.	3.1 Four fully functional large-scale waste treatment undertakings have been	11	Int'l consultant	35.00	0.00	30,555.00

technologies' applications			commissioned (digestion of vinasse from bioethanol production, digestion of cow manure from dairy sector, co-digestion of combined waste feedstock in agro-industry and waste treatment and management project in small size cattle breeding farms).	17	Nat consultant	15.00	0.00	
				21	Sub-contract	50.00	30,455.00	
			Sub-total			100.00	30,455.00	
			3.2 Call for Proposals for and implementation of at least five small to medium scale projects, including (i) design of the call; (ii) feasibility and technical design studies for demonstrations in medium and small sized farms / industries in the targeted sectors; and (iii) implementation of at least five full-scale projects in medium and small sized agro-industries.	11	Int'l consultant	60.00	0.00	1,635.00
				17	Nat consultant	140.00	60.00	
				21	Sub-contract	1,365.00	10.00	
			Sub-total			1,565.00	70.00	
	TA		3.3 Identification of a portfolio of potential waste valorisation projects.	11	Int'l consultant	2.00	6.00	40.00
				17	Nat consultant	8.00	24.00	
				21	Sub-contract	0.00	0.00	
			Sub-total			10.00	30.00	
			3.4 Training of personnel on the operation of at least the four large-scale waste treatment undertakings.	11	Int'l consultant	0.00	0.00	250.00
				17	Nat consultant	45.00	80.00	
				21	Sub-contract	55.00	70.00	
			Sub-total			100.00	150.00	
			Sub-total PC 3			**1,775.00**	**30,705.00**	**32,480.00**
						5.46%	94.54%	
4. Capacity building, training and dissemination campaign for the adoption of low carbon waste	TA	4. The capacities of sector agents to deliver state-of-the-art sustainable production schemes through sustainable waste management and low-emission treatment technologies in prioritized sectors have been strengthened.	4.1 A running web-based knowledge management platform has been set up.	11	Int'l consultant	40.00	34.00	315.00
				17	Nat consultant	30.00	26.00	
				21	Sub-contract	100.00	85.00	
			Sub-total			170.00	145.00	

valorisation initiatives			4.2 Creation of at least (i) 2 toolkits and 2 training courses: (i) Toolkit on identification of waste valorisation project opportunities and technological options, and toolkit on financing waste valorisation opportunities and applying successful business models; and (ii) Training course on identification of waste valorisation project opportunities and technological options, and training course on financing waste valorisation opportunities.	11	Int'l consultant	60.00	20.00	270.00
				17	Nat consultant	30.00	60.00	
				21	Sub-contract	35.00	0.00	
				30	Workshop/ Study tour/ Training	10.00	55.00	
			Sub-total			135.00	135.00	
			4.3 Establishment of a network between different productive sectors to ensure the sustainability of the knowledge management platform after the project is completed.	11	Int'l consultant	0.00	0.00	125.00
				17	Nat consultant	10.00	60.00	
				21	Sub-contract	35.00	20.00	
			Sub-total			45.00	80.00	
			4.4 Dissemination campaign and a dissemination workshop to promote waste-to-energy, waste valorisation and low-emission waste treatment activities and to increase their adoption by farmers, industries and communities.	11	Int'l consultant	15.00	0.00	135.00
				17	Nat consultant	0.00	0.00	
				21	Sub-contract	50.00	0.00	
				30	Workshop/ Study tour/ Training	6.00	30.00	
				35	International meeting	4.00	10.00	
				51	Sundries	5.00	15.00	
			Sub-total			80.00	55.00	
			4.5 Generation of knowledge about the waste valorisation field through the collaboration with universities.	11	Int'l consultant	0.00	0.00	105.00
				17	Nat consultant	0.00	0.00	
				21	Sub-contract	40.00	40.00	
				51	Sundries	5.00	20.00	
			Sub-total			45.00	60.00	
			Sub-total PC 4			**475.00**	**475.00**	**950.00**
						50.00%	50.00%	

5. Monitoring and evaluation	TA	A monitoring plan has been prepared and implemented.	5.1 A monitoring plan has been designed and agreed upon during the Project's inception phase.	11 / 17	Int'l / Nat consultant	5.00	2.50	12.50
				16	Staff travel	0.00	5.00	
			Sub-total			5.00	7.50	
			5.2 Project progress on defined indicators and compliance with UNIDO and GEF guidelines (including gender) is being monitored.	11 / 17	Int'l / Nat consultant	25.00	7.50	62.50
				16	Staff travel	0.00	30.00	
			Sub-total			25.00	37.50	
			5.3 A mid-term review and terminal evaluation have been conducted.	11 / 17	Int'l / Nat consultant	60.00	25.00	85.00
			Sub-total			60.00	25.00	
			Sub-total - PC5			**90.00**	**70.00**	**160.00**
			Subtotal			3,229.73	32,160.00	35,389.73
			PMC			163.00	250.00	413.00
Total Project Costs						**3,392.73**	**32,410.00**	**35,802.73**

SUMMARY KEY BUDGET LINES (COMPONENT 1-5)*		
UNIDO Allotment line	**Funding Source**	
	GEF	**COF**
international experts (11-00)	474,230	138,500
national experts (17-00)	678,500	851,500
subcontracts (21-00)	2,000,000	30,815,000

*All figures exempt of rounding errors.

ANNEX F: ANNUAL BUDGET

				GEF DISBURSEMENT			
Project Components	Expected Outputs	GEF Financing	Co-Financing	YEAR 1	YEAR 2	YEAR 3	YEAR 4
1. Policy and regulatory framework strengthening	1.1 Establishment of a taskforce coordinated by DNE/DINAMA/MGAP responsible for preparing strategies in the targeted sectors.	30,000	40,000	30,000			
	1.2 Studies have been carried out as inputs for enhancing policy instruments covering at least 10 fields; amongst others, these include: i) biogas production and uses of biogas; ii) production of synthetic diesel from organic matter; iii) use of dry manure for combustion; iv) production and application of biofertilizers to the soil.	220,000	150,000	100,000	70,000	50,000	
	1.3 Development and implementation of an action plan to remove financial barriers and provide applicable mechanisms and instruments to favour the inclusion and adoption of new low-carbon waste valorisation technologies in the targeted sectors.	70,000	90,000	35,000	35,000		
	1.4 Identification and design of financial instrument(s) targeting low carbon technologies for waste valorisation and identification of local financial institutions (e.g. banks) that will implement the scale up of the technologies after this project is completed.	50,000	50,000		50,000		
	1.5 Development of new policy / regulation draft or revision of existing policy / regulation based on the pre-identified areas.	124,727	165,000		64,727	40,000	20,000
Sub-total - PC 1		**494,727**	**495,000**	*165,000*	*219.727*	*90,000*	*20,000*

2. Knowledge base (technological capacities) in the fields of waste-to-energy, waste valorisation and low emission waste treatment technologies strengthened	2.1 Disaggregated (department level) physical and chemical characterisation of at least the 16 identified waste streams with valorisation potential.	155,000	160,000	105,000	50,000		
	2.2 Research and prefeasibility studies (including social, environmental and economic dimensions) conducted in the targeted sectors to determine the most viable waste valorisation processes and 'business models'.	240,000	255,000	120,000	100,000	20,000	
Sub-total - PC 2		390,000	415,000	*225,000*	*150,000*	*20,000*	-
3. Demonstration of waste valorisation and renewable energy technologies' applications	3.1 Four fully functional large-scale waste treatment undertakings have been commissioned (digestion of vinasse from bioethanol production, digestion of cow manure from dairy sector, co-digestion of combined waste feedstock in agro-industry and waste treatment and management project in small size cattle breeding farms).	100,000	30,455,000	30,000	30,000	40,000	
	3.2 Call for Proposals for and implementation of at least five small to medium scale projects, including (i) design of the call; (ii) feasibility and technical design studies for demonstrations in medium and small sized farms / industries in the targeted sectors; and (iii) implementation of at least five full-scale projects in medium and small sized agro-industries.	1,565,000	70,000	100,000	800,000	500,000	165,000
	3.3 Identification of a portfolio of potential waste valorisation projects.	10,000	30,000				10,000
	3.4 Training of personnel on the operation of at least the four large-scale waste treatment undertakings.	100,000	150,000	10,000	30,000	30,000	30,000
Sub-total PC 3		1,775,000	30,705,000	*140,000*	*860,000*	*570,000*	*205,000*
4. Capacity building, training and dissemination campaign for the adoption of low carbon waste valorisation initiatives	4.1 A running web-based knowledge mangement platform has been set up.	170,000	145,000		25,000	75,000	70,000
	4.2 Creation of at least (i) 2 toolkits and (ii) 2 training courses: Toolkit on identification of waste valorisation project opportunities and technological options, and toolkit on financing waste valorisation	135,000	135,000			35,000	100,000

	financing waste valorisation opportunities.						
	4.3 Establishment of a network between different productive sectors to ensure the sustainability of the knowledge management platform after the project is completed.	45,000	80,000			15,000	30,000
	4.4 Dissemination campaign and a dissemination workshop to promote waste-to-energy, waste valorisation and low-emission waste treatment activities and to increase their adoption by farmers, industries and communities.	80,000	55,000			20,000	60,000
	4.5 Generation of knowledge about the waste valorisation field through the collaboration with universities.	45,000	60,000	15,000	10,000	10,000	10,000
Sub-total PC 4		**475,000**	475,000	*15,000*	*35,000*	*155,000*	*270,000*
5. Monitoring and evaluation	5.1 A monitoring plan has been designed and agreed upon during the Project's inception phase.	5,000	7,500	5,000			
	5.2 Project progress on defined indicators and compliance with UNIDO and GEF guidelines (including gender) is being monitored.	25,000	37,500	5,000	7,500	5,000	7,500
	5.3 A mid-term review and terminal evaluation have been conducted.	60,000	25,000		20,000		40,000
Sub-total - PC5		**90,000**	70,000	*10,000*	*27,500*	*5,000*	*47,500*
PMC		**163,000**	250,000	*40,750*	*40,750*	*40,750*	*40,750*
Total Project Costs		**3,392,727**	32,410,000	**595,750**	**1,332,977**	**880,750**	**583,250**

ANNEX G: TRACKING TOOL FOR CLIMATE CHANGE MITIGATION PROJECTS

Separate file with file name "Annex G_GEF CC Mitigation Tracking Tool.xls"

ANNEX H: NORMATIVA AMBIENTAL, ENERGÉTICA Y AGRÍCOLA

English executive summary available.

Separate files with file names "Annex H_Policy overview_a.pdf", "Annex H_Policy overview_b.xls" and "Annex H_Policy overview_exesum.pdf"

ANNEX I: INFORME SOBRE RESTRICCIONES FINANCIERAS

English executive summary available.

Separate files with file names "Annex I_Financial barriers overview.pdf" and "Annex I_Financial barriers overview_exesum.pdf"

ANNEX J: "TOWARDS A GREEN ECONOMY IN URUGUAY: STIMULATING SUSTAINABLE PRODUCTION PRACTICES AND LOW-EMISSION TECHNOLOGIES IN PRIORITIZED SECTORS". REPORT: INTERNATIONAL EXPERT (WASTE & WASTEWATER MANAGEMENT / WASTE-TO-ENERGY)

Separate file with file name "Annex J_Waste-to-Energy in Uruguay.pdf"

Please note that Annex J incorporates the key findings from Annex K and Annex L.

ANNEX K: MAPEO PRELIMINAR DE LAS FUENTES DE RESIDUOS Y EFLUENTES EN SECTORES PRIORIZADOS

Separate file with file name "Annex K_Waste mapping.pdf"

ANNEX L: "TOWARDS A GREEN ECONOMY IN URUGUAY: STIMULATING SUSTAINABLE PRODUCTION PRACTICES AND LOW-EMISSION TECHNOLOGIES IN PRIORITIZED SECTORS".

A) **REVIEW OF THE EXISTING BIBLIOGRAPHY AND REFERENCES FROM URUGUAY ABOUT EXISTENT TECHNOLOGIES AND TECHNOLOGICAL DEVELOPMENT FOR ENERGY PRODUCTION AND OTHER FORMS OF WASTE VALORIZATION.**
B) **IDENTIFICATION, STATE-OF-THE-ART, AND GAP ANALYSIS OF THE TECHNOLOGIES FOR ENERGY PRODUCTION AND WASTE VALORIZATION AVAILABLE REGIONALLY**
C) **ASSESSMENT OF THE TECHNOLOGICAL KNOWLEDGE BASE IN URUGUAY**

Separate files with file names "Annex L_Assessment of needs for tech inputs_a.pdf", "Annex L_Assessment of needs for tech inputs_b.pdf" and "Annex L_Assessment of needs for tech inputs_c.pdf"

ANNEX M: "TOWARDS A GREEN ECONOMY IN URUGUAY: STIMULATING SUSTAINABLE PRODUCTION PRACTICES AND LOW-EMISSION TECHNOLOGIES IN PRIORITIZED SECTORS". PILOT PROJECTS.

English translation available.

Separate files with file names "Annex M_Analysis of pilot projects.pdf", "Annex M_Analysis of pilot projects_engl_a.pdf", "Annex M_Analysis of pilot projects_engl_b.pdf" and "Annex M_Analysis of pilot projects_engl_c.pdf"