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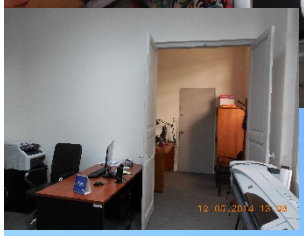
2011-2014

Final Evaluation Project URU/10/G31 "Electricity Production from Biomass in Uruguay" (PROBIO)



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Triple Desarrollo Consultores SpA

Montevideo, April 2015

Project Name	*URU/10/G31 "Electricity Production from Biomass in Uruguay", (PROBIO)*
GEF ID	74451
UNDP PIMS	3618
UNDP Atlas "Award Number	00059520
UNDP Atlas "Project Number"	61545
Country/Region included in Project	Uruguay
Final Evaluation Periodol	December 2014
Final Evaaluation Report Date	April 2015
GEF Focal Area	Cambio Climático
GEF Operational Programme	OP-4
GEF Strategic Priority	CC-SP4 : Promoting grid electricity from renewable sources; Promoting Sustainable Energy Production from Biomass
In Cash Contribution (US$)	1,155,000 (GEF financing: 950,000)
In Cash Co-financing (US$)	UNDP (25,000); Government (180,000)
In-Kind and Investment Co-financing (US$)	Others (595,000); Private Investment (6,750,000)
Executing Agency	MVOTMA-DINAMA
Other Executing Partners	Ministry of Industry, Energy and Mining (MIEM); Ministry of Agriculture, Livestock and Fishery (MGAP)
Estimated date for project start, according Prodoc	Octuber-26-2010
Actual start date for Project Implementation	August 2011
Estimated project closing date according Prodoc	Dec-31-2013
Actual project closing date	31-Dec-2014
Project team of final Project evaluation	Jorge Leiva Valenzuela, Msc in Chemical Engineering, PhD(c).
Acknowledgements	I would like to thank to the project team, DINAMA and UNDP officials for its collaboration and good response for organizing field visits, meetings and interviews. I would also thank to project's partner institutions (DGF, DNE) and private sector for its clear statements and analysis. Doubtlessly, without the provided support, this evaluation work would be impossible to carry out.

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Abbreviations and Acronyms

DGF	General Forestry Directorate
DINAMA	National Environment Directorate
DNE	National Directorate of Energy (name since January 2011)
DNETN	National Directorate of Energy and Nuclear Technology (name until Dec 2010)
GEF	Global Environment Facility
GHG	Greenhouse Gases
GoU	Government of Uruguay
CDM	Clean Development Mechanism
MGAP	Ministry of Agriculture, Livestock and Fishery
MIEM	Ministry of Industry, Energy and Mining (MIEM)
MRV	Monitoring, Reporting and Verification
MSP	Medium Sized Project
MVOTMA	Ministry of Housing, Use of Land and Environment
NAMAs	Nationally Appropriate Mitigation Actions
NEX	National Execution
PIR	Project Implementation Report
UNDP	United Nations Development Programme
PRODOC	Project Document
Units	
kWh	Kilowatt hour
kW	kilowatt
MW	Megawatt
Mt	million tonnes
t	metric tonne

Executive Summary

The Government of Uruguay implemented –between 2011 and 2014- the GEF project URU/10/G31 "Electricity Production from Biomass in Uruguay", (PROBIO), whose **development objective** was to promote the integration of biomass-based power generators into the national electricity grid, through the implementation of scenarios for sustainable and large-scale use of domestic forestry biomass resources. At the same time, the ***project environmental objective*** was to avoid CO2 emissions from power plants based on fossil fuels.

PROBIO was aimed to achieve 5 specific results, namely: i) a comprehensive assessment of domestic forestry resources as an input for policy development, ii) strengthening of the current policy framework for power generation based on forestry and agricultural biomass residues, iii) promoting biomass power generation business opportunities, among industry, investors and public, iv) installing a biomass power plant to supply energy to the national grid; and define a generalized replication mechanism and; v) implement a monitoring and evaluation plan and disseminate the lessons learnt.

The project expected to reach its objectives trough the following actions:

i. A detailed inventory of forestry resources and residues for targeted regions with presence of forestry resources, which would be integrated to a SIG system and its related spatial information;
ii. A survey among key stakeholders, in order to determine potential uses and value of forest products and residues from forestry industry;
iii. Developing of environmental studies, including a strategic environmental assessment;
iv. An in deep review of technical, economic, logistics and relevant managerial aspects for energy production from forestry biomass;
v. Development of a strategy in order to implement energy production based on biomass and its inclusion into the National Energy Plan;
vi. Elaboration of a biomass development plan for 2 regions of the country, in collaboration with municipalities involved;
vii. Preparation of technical guidelines – in consultation with stakeholders- for stablishing emissions, safety, operational and efficiency standards for small biomass power plants;
viii. Review of the political and managerial framework for afforestation; associated with energy production from biomass;
ix. Technical support activities in collaboration with public and private actors and universities, in order to explore the technical capacity and limitations for national production of equipment;
x. Spreading through public awareness campaigns and seminars from experts ;
xi. Set up and technical analysis of a demonstrative power plant generator;
xii. Elaboration of a mechanism for a wide promotion of biomass power generators,-in collaboration with government stakeholders-, which integrates into energy price, parameters considering environmental factors and socio economic externalities at locations where biomass power plants are installed;
xiii. A monitoring and evaluation plan for the program and identification of lessons learnt;

This program responded to the need of having more information on availability, amount and other economic and technical parameters that would be able to encourage the use of the forestry industry remains in the production of electrical energy. The availability and amounts of these remains were perceived as almost unlimited and with zero cost, being these demystified by the project itself.

The design of the project presents some limitations associated with some of its indicators that were related to products rather than results.

It should be noted that almost 6 years elapsed between the elaboration of the project (2006-2007) and its beginning of implementation, time frame where the country undergo a notorious change in the diversification of both, its matrix and institutional energy framework. In the same time, the country experienced an unprecedented economic growth, situation that attracted large-scale transnational companies from forestry sector that concentrated the property of wood plantations in Uruguay, changing in this way the commercial activity pattern of wood and forest products (cellulose, timber boards, etc.).

From 2005, Uruguay elaborated its 2005-2030 energy policy, which was adopted later by all political forces of Uruguay, having as a result a diversification of the energy matrix by incorporating non- conventional renewable energies (mainly eolic, solar and biomass). This integration of renewable energies was possible, since government first strengthened its energy institutional framework and generated public policies to attract energy sector investors, providing important economic incentives to those who wanted to produce energy based on renewable sources.

Therefore, it was noted that while in 2006 biomass power plants were almost inexistent, by 2011 (when Probio effectively started), there were already seven power plants installed, with a base capacity of 60 MW.

This quick development forced changes to the project, which were made through a project's substantive review approved by UNDP and GEF. Main changes were focused on eliminating the pilot plant envisaged in the original version of the project, and changed it for a collation of lessons learnt from three biomass power plants. At the same time, some concepts were revised, such as "forestry residue", its availability and logistical costs involved in its use as energy source.

Because of this adaptation, the project focused more on the development of mechanisms for promoting biomass as energy source, the design of incentives for the entry of new actors, identification of competitive market niches for wood biomass and demonstration of positive externalities for local economies produced by the installation of biomass based power plants. For this last aspect, new concepts for the calculation scenarios made by UTE were incorporated (i.e. "dispatchable","manageable biomass" and "reservoir of biomass" for its management as fuel).

Besides, Probio achieved a prevailing role in the coordination of the different stakeholders involved, public and private, in order to introduce the biomass subject in the agenda of these organizations.

It should be emphasized that Probio's management was a model of a very horizontal participation among the involved organizations, where the project steering committee exerted its strategic role

in program guidelines. At the same time the project incorporated its professional specialists into each involved public institutions, thus tackling different biomass issues from inside of the institutions themselves, giving to project a good tuning between its own priorities with those from these bodies.

As implementation is concerned, the project achieved its development objective, since it created a context of more certainty and accuracy for the technical, economic and environmental information needed for the development of public policy instruments and decision making for private business related to biomass.

Regarding specific outcomes, for ***Result N°1:*** "a comprehensive assessment for local forestry resources has been completed as input for policy development, including a survey for domestic market issues". The project team made an important study focused on identifying actors, collation of regulations and available information on biomass residues' stocks; and a preliminary assessment of legal, technical or availability barriers for biomass use as fuel. Specialized consulting firms were hired to make the census for the wood industry (sawmills, plantations, manufacturing plants), whose objective was the elaboration of a database for biomass availability, with its GIS module for obtaining the spatial distribution of biomass resources.

At the same time, an agreement with INIA Tacuarembó was signed, for elaborating a study of characterization of forestry products.

At the time of project's final evaluation, the database is finished and the GIS module is at its final testing stage, then it will published afterwards in the DGF webpage, and by 2015 the database could be shared with other state organizations (DINAMA, INIA and DNE).

The INIA study is in the middle of its implementation, pending the sampling for half of the sites and lab studies for characterization for remains of forestry activity and related industry (sawmills and transformation plants). Results from this study would be available by first half of 2015.

Regarding the Strategic Environmental Assessment (SEA), the project substantive revision decided to change this assessment by the elaboration of basic studies that would be used as inputs for the elaboration of a future SEA when project ends. The reasons mentioned for this change are that DINAMA is just starting activities of making SEAs for different economic sectors, and the project SEA was unique and very specific subsector. Therefore, its priority was low in comparison with other sectors and besides, DINAMA considered that it had no sufficient information to start a SEA for tis subsector.

Consequently, it was decided to carry out the following base studies as inputs for a future SEA: i) emissions from biomass plants (October 2012-April 2014); ii) monitoring and air quality assessments (March-Sept-2014); iii) baseline; iv) collection and MRV methodology analysis for elaboration of NAMAs and estimates for potential GHG reductions from biomass energy generation subsector in Uruguay (Oct 2013-April 2014); v) exchange of activities with other areas from DINAMA for discussing ash composition and disposal from biomass power plants (Waste, Impact Assessment and Environmental Control units, and biomass private plants), and vi) training for DINAMA officials and employees from private sector about emissions' measurement protocols for biomass boilers, and planning for monitoring air quality as well.

For Result N°2: "The current policy framework for electricity generation from waste biomass of agriculture and forestry industries has been strengthened". One of the main project activities was the elaboration of a study for analysis of results from calls for biddings made under the Decree 367/010. This study consisted in interviews to companies that participated in the bidding process, in order to identify the factors that would be generating low private sector participation and define conditions for improving this participation. UTE was also advised about guidelines and orientations for "data room" (3) and presentations for attendants to these events were made, before bids occurred.

Another relevant contribution made by the project was the study that showed the positive externalities for local communities from wood biomass power plants (increase of biomass related activities, workforce employment, capital increases, strengthening of productive chains, energy sovereignty, etc.); and incorporated innovative concepts such as "biomass reservoir" (equivalent to water reservoir for hydroelectricity) and "dispatchable biomass".

A cost simulation for power generation from biomass was also made with the SimSee software, where different scenarios for biomass introduction were simulated.

The collaboration brought to UTE and DNE resulted in the elaboration of a new decree, calling for bidding 60 MW of power generation from biomass, incorporating the concepts developed by the project. Release of this decree is expected by end of 2014 or first half of 2015.

Assessments for environmental impacts from biomass technologies were also made (particulate matter and gas emissions, and ash production), and proposals for emissions and air quality monitoring for biomass plants were elaborated.

Regarding the elaboration of a strategy for biomass use in energy generation, a series of meetings with key stakeholders from Tacuarembó and Rivera departments were made, it brought support for foundation of the "Cluster of Wood from Tacuarembó and Rivera", and regular participation in meetings of the "Forestry Wood Sectoral Council (CSFM)". Besides, it assisted in the creation of the "Forest Biomass to Energy" subgroup inside of the "Commercial and Industry Association of Rivera", and supported the organization of the workshop for the elaboration of the Strategic Plan and definition of the first action lines for the "Cluster of Wood from Tacuarembó and Rivera".

Although it is true that there is no an official document for the strategy at the time for the final evaluation, stakeholders have been organized around the use of biomass as energy and is expected that the involved departments would elaborate a formal document of strategy by 2015.

For Result N°3: "Business opportunities related to biomass power generation have been promoted among companies, investors and general public". This work was 100% made by the project team, since it was decided not to work with the CIU (Industry Chamber of Uruguay), because there were two technology providers among its associates, situation that created conflict of interests. The following activities were carried out: i) assessment on the current local capacity for developing equipment and services for biomass plants; ii) one workshop on "Sustainable Use of Biomass for Energy Uses; iii) "Conference on Progress of Management and Production of Biomass for Energy

Uses" (Paysandú). Activities for promotion were made on a continuous basis between 2012 and 2014.

The project webpage was also created, and a series of press releases were issued, along with the organization of an initial workshop composed by thematic and energy crops workgroups.

For Result N°4: "A biomass power generator plant (5MW) has been installed, supplying energy to the national electricity grid, and a mechanism for its wide replication had been prepared", the project Substantive Revision eliminated the demonstrative pilot plant component, and a report on lessons learnt was prepared instead, based on experiences from three biomass power plants.

For Result N°5: "A monitoring and evaluation plan has been implemented, and lessons learnt have been disseminated". Since medium term evaluations are not required for GEF MSP, it was decided to make a substantive revision, in order to update the project to the current reality of use of biomass as energy.

For dissemination of lessons learnt, a nine minutes video was prepared and 500 informative brochures were printed.

The main conclusions from this evaluation are as follows:

The weaker part of the program was its design, since some of its essential assumptions (based on available information at the time of elaboration of the project) did not fit the real situation of biomass resources (free availability, zero cost residues, etc). However, thanks to the good adaptative management made by the project team, the program was updated and aligned it with the current situation of the country.

The indicators and results stipulated in the design of the project resembled products rather than indicators for results.

The long timeframe elapsed between elaboration and beginning of the project (almost 6 years), played against it, since the reality of the country drove forwards with much strength in those 6 years, leaving obsolete some program's results, even though its objectives and main results were still valid.

Changes made to some project indicators and objectives of program's specific components, also had issues. In the first place, it is not recommendable to change indicators and objectives, but it is better to explain the reasons by which indicators are not suitable and why some specific results could not be obtained.

Probio attained its development objective, which was to create the proper scenarios for biomass energy generators would connect to the national electricity grid.

The environmental achievement of avoiding CO2 emissions as a direct consequence of project activities could not be reached in the project's implementation period, but it is highly probable that it will be attained once the UTE's bidding process for purchasing 60 MW of biomass energy is ended.

The results 1,2,3 and 5 have been satisfactorily reached. The result N°4 is questionable from the point of view of declaring as attained before project starts. However, there is a strong probability

that Probio could have directly generated 60 MW of installed power capacity, once UTE's bidding has finished.

Probio is and it has been relevant for the country, since it is in the energy policy framework of Uruguay and is perfectly integrated into the local development economic areas and institutional strengthening of government bodies such as DINAMA, DGF y DNE.

The management system of the program, which consisted in a participative and horizontal approach with the associated institutions and the hiring of own professionals located inside of these institutions, achieved a high impact in identifying institutional priorities and align them with Probio's objectives.

The program succeed to incorporate biomass issues into the daily work of local organizations and contributed to the inclusion of biomass into local development strategies of these organizations.

The project steering committee met on a regular basis with the highest authorities of each involved institution, and its discussions incorporated the country strategic aspects into Probio. ***The adaptative management*** and project follow up were suitable and in line with GEF guidelines.

Sustainability of results and Probio good practices are ensured with the implementation of the new GEF project called "BioValor" and continuation of the main part of program's trained employees working at each involved institution. However, sustainability threats are related with aspects that are out of government control (low oil prices) and the massive incorporation of natural gas as energy source. These threats are more concentrated in new actors entering the market, but not for current actors integrated to the chain value of forestry biomass.

Main recommendations are the following:

For project design, is recommend that indicators should be for results. A document, or policy, etc are not results, but stakeholders using these products, for instance, it is a result.

It is suggested to optimize the number of indicators, focusing on key aspects of a program.

For coming experiences of substantive revisions, it would be the best to leave indicators and results as they were stablished in the original version of the prodoc, since this will allow the evaluator to have a clearer view of what was expected to achieve and the issues related to each program component. It is best to explain if an indicator is whether or not appropriate and issue contextual information that allow evaluator to balance all involved factors.

It is suggested not to declare in the program logic framework that objectives have been reached before implementation begins, since these are not results from the program itself.

The participative management and respectful to the existent institutions is seen as positive for Probio results. It is suggested to continue along this line for activities that follow to this program.

Approaching to local authorities and organizations would have a good impact in the ownership of biomass issues by neighboring communities.

It would be convenient that DINAMA would exert an active role in enforcement, elaboration of specific regulations and solutions for some environmental issues coming from biomass

technologies, such as conditions for fuel storage, particulate matter and gaseous emissions control and ash disposal.

The rating for Probio is the following:

Rating Project Performance			
1. monitoring and Evaluation:	***Rating***	**2. IA & EA Execution**	***Rating***
Monitoring and Evaluation (initial design)	S	Implementing Agency Execution	S
Monitoring and Evaluation (implementation)	S	Executing Agency Execution	S
Overall quality of M&E	S	Overall Quality of Project Implementation/Execution	S
3. Outcomes	**Rating**	**4. Sustainability**	**Rating**
Relevance	R	Financial resources	L
Effectiveness	HS	Socio-economic	L
Efficiency	S	Institutional framework and governance	L
Overall Quality of Project Outcomes	S	Environmental	L
		Overall likelihood of risks to Sustainability:	ML

1. Introduction

1.1. Purpose of the Evaluation

The UNDP country office of Uruguay made a public call for bidding, in order to carry out the final evaluation of the project URU/10/G31 "Electricity Production from Biomass in Uruguay (PROBIO)", which is a medium size project financed by Global Environment Facility (GEF).

The main project objective was to promote the integration of biomass-based power generators into the national electricity grid, through the implementation of scenarios for sustainable and large-scale exploitation of local remains from forestry industry and agroindustry.

The UNDP country office of Uruguay had the role of implementing agency, whereas DINAMA was the project national executing institution. The General Forestry Directorate (DGF) and the National Energy Directorate (DNE) were the co-executing agencies.

In line with policy and procedures for M&E from UNDP and GEF, all medium size projects supported by UNDP and funded by GEF, should have a final evaluation once its activities are finished.

1.2. Scope and Methodology

According to the ToR for the final evaluation, it is desired to know if project reached the required results, in line with the expectations established in the project logical framework.

The GEF final evaluations involve a full review for the project in its different stages, starting with the ***design analysis*** (logic frame, key actors participation, implementation agreements, institutional capacity of the executing agency, the proper approach for the subject, risk analysis and expected results); following with its ***implementation*** (use of the logic frame as a tool for M&E, planning, implementation agreements, adaptative management, roles of the executing agencies, partners, UNDP and interactions with key stakeholders.

Financing (level of budget execution, annual planning, compliance with matching funds, and effectiveness and efficiency of the expenditures made for attaining the expected results), ***prospects and sustainability*** for the results (risks and challenges) and eventually impacts achieved, according GEF methodology, are also reviewed. Subjects like replication opportunities and lessons learnt are addressed as well.

The methodology used is the one published by UNDP "Guidelines for Conducting Terminal Evaluations of UNDP supported, GEF Financed Projects", which establishes the steps and procedures for evaluating GEF funded projects implemented by UNDP.

The terminal evaluation consisted in a documentary review, including project document, contract, annual progress reports, Steering Committee acts, annual work plans, UNDP country program documents, etc. The details of all documents reviewed can be found in ***Annex 5***.

An evaluation matrix was also elaborated and contained the questions that need be answered in the course of this work, which it is shown in Annex 6.

The field mission to Uruguay took place afterwards on December 3-9, 2014 (see agenda in ***Annex 2***), where all project's key stakeholders were interviewed (program and financing officials from UNDP, the project team, professionals and executives officials from DINAMA (Divisions of Environmental Control, climate change, Environmental Impact Assessment), DGF, DNE, UTE, INIA, privates and organizations from forestry sector (Wood Association and Wood Forum). The UNDP Regional Technical Advisor (RTA) and the Director of DINAMA were interviewed via Skype (see details for interviews in Annex 3)

During the field mission, DGF offices were visited in order to revise some works made by the project.

Lastly, before leaving the country, the evaluator presented the preliminary results from the evaluation to the project team and UNDP official.

Regarding the financial analysis for the project, documentation brought by the project team and UNDP, such as bidding documents, contracts, financial statements and the independent audit report made by Deloitte were revised.

All collected information was crosschecked with project activities and progress towards its objectives and results, situations dealt with by the project team and solutions envisaged for overcoming the problems found.

It is important to note that, as being a mid sized project, GEF requirement for a mid-term review does not apply for this type of project. Instead of that, the project team made a substantive revision of the project, where some indicators and important activities were modified. This substantive revision was presented and approved by GEF, and its analysis is part of this terminal evaluation.

Lastly, every project stage was scored, according to the scale elaborated by the methodology of GEF, and shown in Table N°1.

It should be noted that the methodology used was of ample participation of key stakeholders involved in the project, who presented its visions on design, implementation and project results. These statements were corroborated with the documentary evidence and, when not possible, an attempt for maintaining the proper objectivity of each message and analyze the contexts that could affect the project in the different stages of its life cycle and its prospects was made.

Table N°1: Rating scale used by GEF[1].

Relevance	Results, efficiency, M&E, implementation	Sustainability	Impact
2. Relevant ***(R)***	6: Highly Satisfactory ***(HS***): Project had no shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency.	4. Likely ***(L)***: negligible risks to sustainability.	3. Significant ***(S)***
1.Not Relevant ***(NR)***	5: Satisfactory ***(S)***: There were only minor shortcomings.	3. Moderately Likely ***(ML):*** moderate risks.	2. Minimal ***(M)***
	4: Moderately Satisfactory ***(MS)***: Project had moderate shortcomings	2. Moderately Unlikely ***(MU):*** significant risks.	1. Negligible ***(N)***
	3. Moderately Unsatisfactory (***MU)***: Project had significant shortcomings.	1. Unlikely ***(U):*** severe risks.	
	2. Unsatisfactory ***(U)***: there were major shortcomings in the achievement of project objectives in terms of relevance, effectiveness, or efficiency.		
	1. Highly Unsatisfactory ***(HU***): The Project had severe shortcomings.		

1.3. Structure of the Evaluation Report

This report has ***six sections*** clearly identified. On its cover page a general project information is shown (amounts, Id codes, implementing and executing agencies, deadlines, etc.), followed by a ***glossary and an executive summary*** where the reader will find a synthesis of the project, main findings, recommendations and conclusions, along with the general rating for the project.

In the ***introduction section***, scope and objectives of the evaluation work can be found, as well as methodology used and the main milestones for this work are described in detail.

Later, ***section 2*** is focused in the country development context analysis, referred to the subject which is wanted to address and the approach used to deal with, showing details about expected deadlines for project implementation, its immediate objectives, required results and key indicators, as well as arrangements of coordination and partnerships with key actors involved.

Section 3 shows the findings of the evaluation, which covers design, implementation (financing and activities), results obtained and their sustainability.

In ***section 4***, project ratings will be found, while ***section 5*** shows all conclusions, recommendations and lessons learnt.

Lastly, ***section 6*** has the annexes, where information on mission agenda, ToR for the terminal evaluation, logic frame matrix, list of document reviewed, etc., can be seen.

[1] "Guidance for Conducting Terminal Evaluations of UNDP- Supported, GEF Financed Projects", UNDP, Evaluation Office 2012, page 29.

2. *Project Description and Development Context*

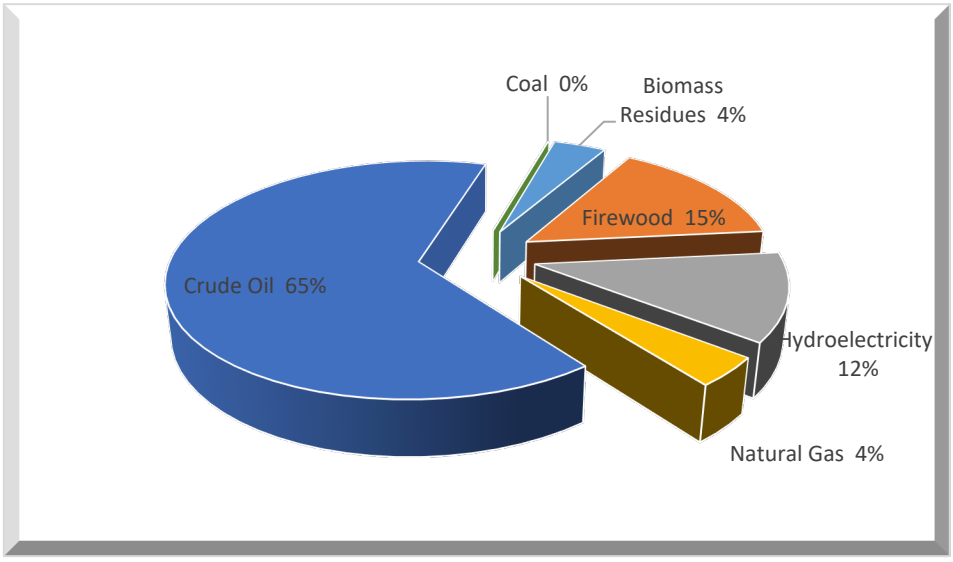
2.1. Development Context and Assessment of the Biomass use Situation in Uruguay[2].

According to a study coordinated by La República University and UNIDO, the experts' prospects about the future of the Uruguayan energy sector for the period 2002-2015, was one of a growing dependency situation from third countries and, excepting the incorporation of natural gas, no important changes in the energy matrix for 2015 were envisaged.

In accordance with this vision, a long-term proposal for the sector would be heavily based on an efficient integration with neighbor countries, the efficiency between supply and the rational energy demand; and the development of substitute energies. For this last subject, it was proposed that the country investigated the development of biomass energy, wind, firewood and biodiesel among other options[3].

By 2006, oil represented the 65% of the energy supply, followed by firewood with a 15%, according to Figure 1[4]. The use of biomass as energy reached only 4% of the energy matrix.

Fig. 1: Relative importance of several energy sources in Uruguay, for the year 2006



During project elaboration, the production of electricity of an average year in Uruguay mostly depended from hydroelectricity in an 80%. However, due to the erratic behavior of rains and growing demand for energy, the national state producer and distribution company – UTE -, had to reformulate its expansion plan for 2006-2010, in order to add 500 MW of new generation from thermal plants based on fossil fuels.

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[2] Unless specifically mentioned, the content for this section is based on the project document PIMS 3618 URU/10/G31 "Electricity Production from Biomass in Uruguay (PROBIO)"

[3] "Programa de Prospectiva Tecnológica Uruguay 2015: Resumen Ejecutivo"; Presidencia de la República Oriental del Uruguay-Organización de Naciones Unidas para el Desarrollo Industrial; Álvaro Ramos, Octubre 2002.

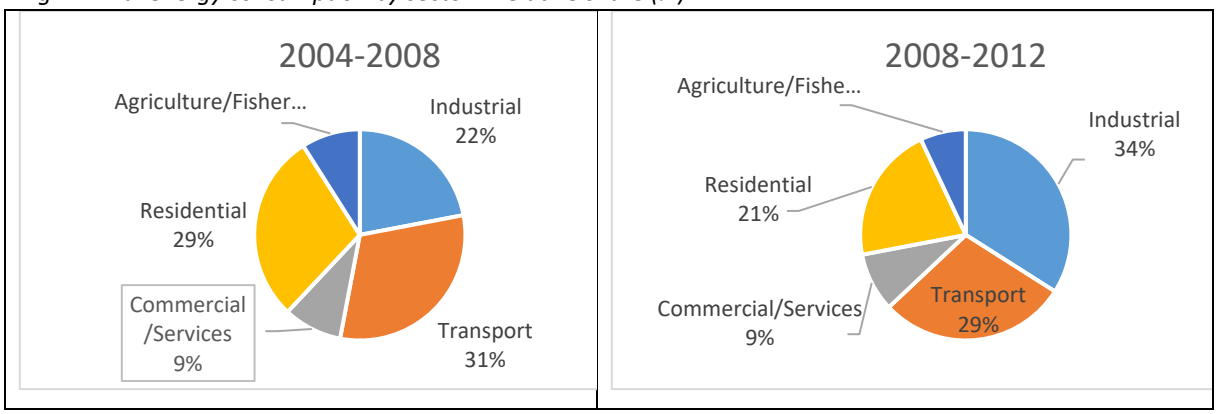
[4] "INFORME FINAL Estudio de Caso – Uruguay"; Proyecto: Planificación Energética; Claudio Espinoza M, Sept.2009.

The interconnection with neighbor countries as Argentina, sharply dropped in 2004 due to a reduction supply of cheap natural gas from that country, while with Brazil, the electrical energy backup was the least (approximately 70 MW).

Since 2005, the gross domestic product (GDP) of Uruguay has been increasing by an annual average rate of 6%, while the Direct Foreign Investment (DFI) for the period 2005-2013 was a 5.7% of the GDP, very different from the 80' and 90's decades, where the DFI was only a 0.5% of the GDP. The DFI brought mega investment projects such as the cellulose plant of Montes del Plata (US$ 2,600 millions), the Aratirí mining project (US$ 3,000 million) [5], as well as the installation, in 2007, of the cellulose plant of UPM (US$ 1,200 million).

At the same time, the energy consumption for the industrial sector jumped from a share of 22% in 2008 to a 34% in 2012[6], as shown in Fig. 2.

Fig. 2: Final energy consumption by sector – relative share (%)



The implementation of the Forestry Law N°15.939 from 1989, which granted a series of incentives to favor the installation of forestry plantations in the country, resulted in an accelerated increase of the forests' crop area, going from 661,000 Ha in 2000 to 736,000 Ha in 2006. Crops were mainly pine and eucalyptus, being the last the most common with a share of 75% of the crop area[7]. At the same time, the development of forest crops led to an increasing industrialization of the forestry activity, including the construction of two large cellulose plants. By 2012, the crop area was 962,000 Ha.

Table N°2: Development of forestry crops in Uruguay.

[5] Informe de Terminación de Proyecto (PCR) Proyecto UR-L1033: Programa de Modernización de la Institucionalidad para la Gestión y Planificación Ambiental; Luis F. Macagno; Banco Interamericano de Desarrollo, Junio 2014.

[6] Energías renovables, Oportunidades de inversión, Agosto, 2014; Uruguay XXI, Promoción de Inversiones y Exportaciones.

[7] Ver presentación: "Biomasa forestal para producción de energía en Uruguay: una visión desde la oferta"; Walter Oyhantçabal, Unidad de Proyectos Agropecuarios de Cambio Climático-MGAP, Uruguay; 21 y 22 de febrero de 2005. Buenos Aires

Year	2000[8]	2006[9]	2012[10]
Area (thousands of Ha)	661	736	962

At the time of project elaboration, there was a general perception that the boom of forest crops would lead to a significant growth of forestry residues (estimated in 2.7 million tons), that would be available for its use as energy at almost no cost[11]. With regards of forestry crops' ownership, it has to be noted that this was notoriously concentrated in the period 2000-2011, having as a result that the two cellulose plants control almost 50% of the forest plantations (400,000 Ha), whereas the two companies producing semi-elaborated products manage 100,000 Ha and eight investment funds control the other 150,000 Ha. In short, almost 75% of forest crops are controlled by nearly 10 companies, who ultimately impose their views to the forestry chain as a whole[12].

Uruguay does not possess proven reserves of fossil fuels and besides, in 2006, it was a country dependent from oil and natural gas imports (65% and 4% of the energy matrix respectively). The government started to work intensively from 2005 in the elaboration of a mid and long term policy that would enable the country to have a balanced energy matrix and secure its "energy sovereignty". In this way, it elaborated the energy policy 2005-2030, which was confirmed later by a wide consensus among all the political forces of Uruguay and, up to present, it constitutes the "navigation map" for all energy issues.

The 2005-2030 Energy Policy defines four main focus:

a) State's guideline role, with regulated participation of private actors.

The above implies an essential role for MIEM as a driver of the energy policy and organizer of the different actors from the energy market; to count on lead state energy companies, efficient and dynamics; to have a transparent regulatory framework for all energy sector, giving guarantees to both providers and consumers; an enforcement independent entity (URSEA); and lastly the boost in research and innovation on energy issues.

b) Diversification of the Energy Matrix for both, sources and suppliers.

This means to guarantee the supply at proper prices, reductions of dependency on oil imports, incrementing participation of indigenous sources; promoting the introduction of non-conventional renewable energy sources (eolic, biomass, solar and agro fuels), introducing other energy sources (natural gas and occasionally coal and nuclear); giving incentives to enterprises generating local development; and guaranteeing the environmental care.

[8] La Actividad Forestal a través del Censo Agropecuario; MGDAP-DIEA, Junio 2003; http://www.mgap.gub.uy/portal/page.aspx?2,diea,diea-pub-forestacion,O,es,0,

[9] Anuario Estadístico Agropecuario 2008; http://www.mgap.gub.uy/portal/page.aspx?2,diea,diea-anuario-2008,O,es,0,

[10] Uruguay Rural en Cifras; http://www.mgap.gub.uy/portal/page.aspx?2,diea,diea-resumen-de-la-informacion,O,es,0,

[11] PRODUCCION DE ELECTRICIDAD A PARTIR DE BIOMASA EN URUGUAY (PROBIO); Informe Final; Revisión Sustantiva; Humberto Rodríguez; Mayo 2013.

[12] "EL POTENCIAL IMPACTO DE LOS DERECHOS DE PROPIEDAD INTELECTUAL SOBRE LA CADENA FORESTAL EN URUGUAY"; Comité de Desarrollo y Propiedad Intelectual (CDIP); Undécima sesión, Ginebra, 13 a 17 de mayo de 2013, pág. 6.

c) Promotion of the Energy Efficiency in all sectors.

This requires incorporating all sectors of the country activities in the rational use of the energy, such as transport, construction, lighting, education, consumers, etc. Specifically, this component is developed through the efficiency energy leads by DNE.

d) Protection of a proper access to energy for all social sectors.

Energy is conceived as a human right, since all have to have access to it. This implies the development of programs destined to make available to all social sectors, the benefits of having energy in all its forms.

The energy policy 2005-2030 has short, mid and long term goals, as shown in Table N°3.

By 2015, it is expected that 50% of the primary energy come from renewable sources, with a share of 15% for non-conventional renewable energies in the electricity generation; while for 2020, an optimal use of these energies is envisaged. All these goals are in a context of reduction in energy consumption through energy efficiency practices.

Among its action lines, the energy policy aims to incorporate through private investment, 200 MW of energy production from biomass.

At the same time, some state entities related with energy issues were reformulated, such as the merging of the National Energy Directorate and the National Nuclear Technology Directorate into a single entity called "National Directorate of Energy and Nuclear Technology" (DNETN, currently DNE), that it is located in the Ministry of Industry, Energy and Mining (MIEM) [13]. In addition, the government of Uruguay started a strengthening process for the DNE's role as organizer and planner of both state institutions and actors from the energy sector market, from the perspective of human resources, technical and funding[14].

With regards of the environmental institution (DINAMA), this also had an in deep restructuring process between 2007 and 2010, with the aim of providing modern and efficient services to face the growing amount of studies and applications entering the environmental impact assessment system, whose roots were the high investment rate experienced by the country.

The energy policy in Uruguay is defined by the Ministry of Industry, Energy and Mining (MIEM), and specifically by the National Energy Directorate (DNE), whereas specific tariffs and enforcement are in charge of the Regulatory Unit for Energy and Water Services (URSEA). Lastly, the state companies UTE and ANCAP are in charge of the implementation of the energy policy. The energy institutional structure of the country is shown in Fig. N°3.

Table N°3: Goals of the Energy Policy of Uruguay[15].

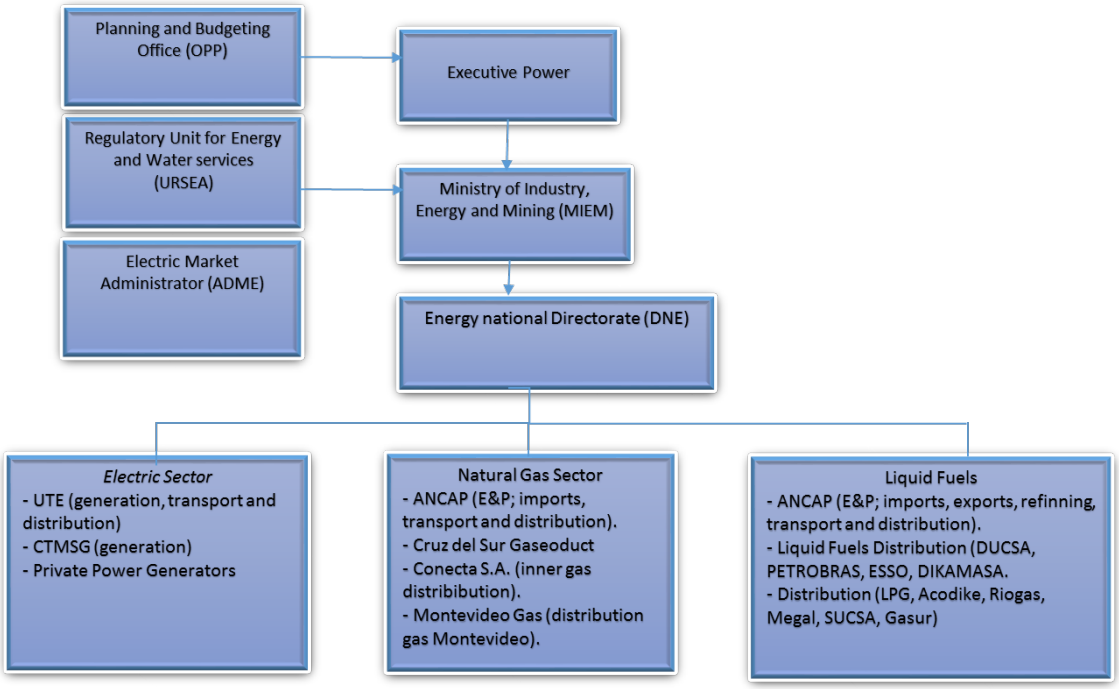
[13] DECRETO 151/004.

[14] Ver "INFORME FINAL, Estudio de Caso – Uruguay, Proyecto: Planificación Energética; Organización Latinoamericana de Energía (OLADE), Agencia Canadiense para el Desarrollo Internacional (ACDI) y Universidad de Calgary, Septiembre 2009.

[15] Informe: Medio Ambiente y Energía en Uruguay. Aspectos de la temática energética desde una visión ambiental; Dirección Nacional de Energía (DNE), la Dirección Nacional de Medio Ambiente (DINAMA) y la Agencia Española de Cooperación Internacional para el Desarrollo (AECID) en Uruguay.

Year	Supply	Demand	Social
2015	50% of the total primary energy matrix comes from renewable sources. 15% of electricity generation comes from non- conventional renewables sources (eolic, biomass residues and micro hydraulic generation). 30% of the country's agro-industry and urban wastes are used for generating different kind of energies.	The culture of energy efficiency has pervaded the whole society	100% of country has electricity, by means of a mix of mechanisms and sources.
	The country counts on national companies producing energy inputs and develop processes that are energy efficient.		
2020	Optimal use of renewable energies, specifically eolic, biomass, thermal solar and bio-fuels. Balance in the use of residues for energy generation. Stable and sustainable natural gas supply. Heavy oil processing facility La Teja, is modernized. Vertical integration for ANCAP has been reached. Exploration for energy searching of the national territory has been made Pilot plans for new energy sources and/or technology in progress, have been made.	The national energy consumption has decreased 20% relative to the trend scenario, through a mix of actions promoting energy efficiency.	A proper energy access for all society sectors has been reached.
	The country has leading companies in the Region, producing energy inputs and develop processes that promote energy efficiency.		
2030	Uruguay energy model is a worldwide model; in particular, the country's energy intensity is one of the best in the world. Since 2010, the country has saved at least 10 thousand millions, by both substituting sources and promotion of energy efficiency, in relation with the trend scenario. The country counts on world leading companies that produce both, energy inputs and develop energy efficiency promoting processes.		
	The country is leader in the use of some specific sources and in the development of particular technologies and energy processes		
	Regional energy integration has been reached; in particular, there are bi and tri-national projects in progress.		

Fig.N°3: Energy institutional framework in Uruguay.



In this way, with the implementation of the energy policy, the country entered into a quick expansion cycle of investments in electrical generation, thanks to the development of a series of regulatory instruments for promoting these investments, particularly in the renewable energy sector such as eolic and biomass. In the last five years, investments in the energy sector exceeding US$ 7,000 million were made, meaning that the country annually invests more than 3% of its GDP for energy infrastructure[16].

Table N°4, shows a summary of the main regulations promoting renewable energies, implemented in the period 2005-2012.

As a result, there currently are 437.5 MW of power coming from biomass. In this context, UPM and Montes del Plata are the most significant power generators, with a share of 324 MW (74%, using “black liquor”), while power generation from forestry and rice husk remains reaches 113.5 MW (26%), with 8 companies as it is shown in Table N°5.

Before concluding this section, it is safe to say that between the years 2005 and 2010, the Uruguayan government intensively worked in the development of instruments that could incentive the introduction of non-conventional renewable energies, whose results have been mainly achieved from 2010. Among these energies, those originated from forestry biomass had a significant development, letting scale up from 29.7 GW of power generated in 2006 to 1,448 GW in 2013, as depicted in Figure N°4.

[16] Energías renovables, Agosto 2014, Oportunidades de inversión, Uruguay XXI; pág. 13

Table N°4: Main regulations for promotion of the renewable energy sector, implemented between 2005 and 2010.

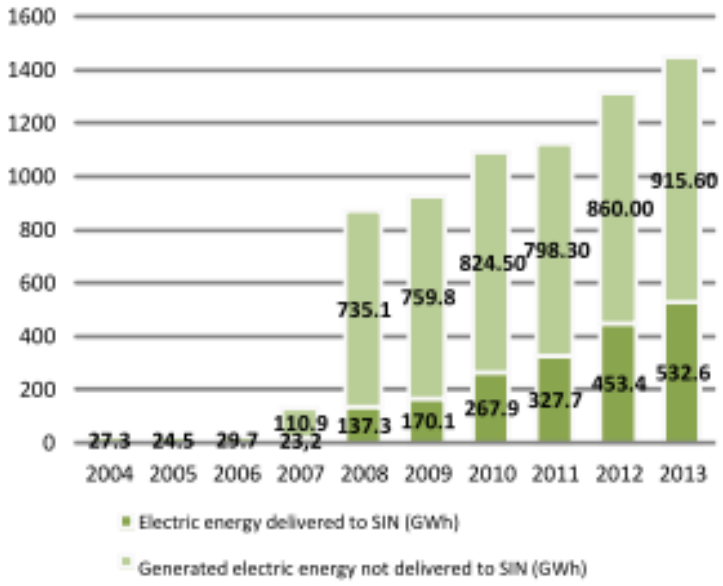
Norma	Año	Contenido	Impacto
Decree 367/010	2010	It encourages the incorporation of electrical power based on biomass, to the national energy matrix. Contracts are awarded for power plants up to 20 MW of capacity, using biomass as primary energy source, with long-term contracts for a maximum of 20 years.	14 companies participated in the bidding process and 2 contracts were awarded to the company Bioenergy S.A., who will install two power plants of 20 MW each. It is probable that it will start operation by 2015.
Decree Nº 173/010; from law 18.585	2010	It allows installations of power generation, based on renewable sources, such as eolic, solar, biomass or mini-hydraulic, for low voltage distribution grid connected subscribers.	
Ministry Resolutions 1895/10 and 1896/010	2010	The establish conditions for micro power generation base on renewable energies, and sell to the electric grid.	
Decree 354/009	2009	It promotes power generation from non-conventional renewable sources, and release from IRAE (taxes) when electricity is sold in the full term contracts' market (Decree 360/2002).	
Decree 77/006	2007	It promotes special contracts for energy purchases between UTE and small biomass and eolic power generators.	5 power plants signed contracts, 3 of them utilized biomass as fuel: Fenirol (10 MW), Bioener (12 MW) and Galofer (14 MW).
Decree 397/007	2007	It modifies article 1° from decree 77/006 and increases the maximum power to install by power plants (up to 20 MW), but maintaining as maximum power for contract by UTE at 10 MW, and counting on the possibility of selling the excess in the spot market.	3 biomass power plants sign contracts: Weyerhaeuser (12 MW), Ponlar (7,5 MW) y ALUR (10 MW).
Decree 389	2005	It pays US$52/MW for renewable sources selling to the interconnected system.	
Law 16.906: Promotion law for national and foreign investments.	1998	i) It frees from economic activities income's taxes (IRAE), between 20% and 100% of total invested amount, according project type; ii) It frees from taxes for worth goods and chattels from fixed assets and civil engineering works; and returns the VAT for materials and services purchases; iii) It frees imports taxes and fees for goods and chattels of fixed assets, declared as no competitors for local industry.	General to all investments, including renewable energies.

Table N°5: Biomass power plants in operation.

N°	Nombre	Año Ingreso al mercado	Tipo Combustible	Potencia Autorizada (MW)
1	Bioenergy S.A.*	2015	Forestry biomass	43
2	Punta Pereira S.A.	2014	Black liquour	164
3	PONLAR	2012	By products from neighbor forest industry.	7,5
4	ALUR	2010	Wastes, chips and eucaliptus sawdust	10
5	Bioener	2010	Byproducts from local sawmill	12
6	Galofer	2010	Rice husks	14
7	LIDERDAT S.A	2010	By products from forest industry and wood chipping industry.	5
8	Weyerhaeuser Productos	2010	By products from board veneering process	12
9	Fenirol S.A.	2009	Forestry by products (field and industry) and rice husk	10
10	UPM	2007	Black liquour	160
Total				**437,5**

(*): project approved and with an UTE contract.

Fig N°4: Power generation base on biomass (GW) for the period 2004-2013 (UMP and Punta Pereira included)[17].



[17] IDEM ref. 15

2.2. The Project

2.2.1. Project start and length

Project preparation started on September 2005 with a PDF-A approval for elaborating a midsized project, which would incorporate the utilization of forestry biomass as a renewable energy source in Uruguay, with the aim of contributing to a sustainable development by reducing both, the country's oil dependence and the CO2 emissions that affect the world climate. These objectives would be achieved by removing the existing barriers for commercial development of the forestry biomass energy and showing a practical case for replication[18].

The document proposal was finished in 2006, but since Uruguay was in the process for approval of other GEF project related with the development of eolic energy, the biomass project had to wait for financing until November 2008 and signature of the project document on October 2010.

As it was discussed early in Section 2.1, the country experienced an accelerated process of institutional changes and definitions in the energy and forestry sectors, which meant an unexpected boost in the project document, referred to the inclusion of renewable energies in the country for the period 2005-2010.

The project URU/10/G31 "Electricity Production from Biomass in Uruguay" (PROBIO), had a duration of 3 years term and should start on October 2010 and end on October 2013. In practice, project started its implementation on March 2011 and its closure would be December 2014.

The total project budget was US$ 8,5 millions, from which US$ 1,148,913 were in cash, US$ 595,000 in kind and committed private investments reached US$ 6,750,000. Table N°6 shows the distribution of the funds, according project document.

The implementation was carried out under the system of National Execution (NEX). The project executing agency was the MVOTMA, through DINAMA, whereas the Energy National Directorate (DNE) and the General Forestry Directorate (DGF) played as partners during project implementation and were part of the project Steering Committee.

Table N°6: Contributions from GEF, Government of Uruguay and other institutions, according project document.

Contributor	In Cash	In kind	Investment	Total (US$)
GEF	950,000			950,000
Government of Uruguay	180,000	595,000		775,000
UNDP-TRAC	25,000			25,000
Private Investment			6,750,000	6,750,000
Total	***1,155,000 (*)***	***595,000***	***6,750,000***	***8,500,000***

(*): it includes a fee of US$ 6,087 for management and implementation support of the implementing agency

[18] Ver UNDP-GEF "Request for PDF Block A for a MSP Project" for project Id 3618, page 5.

2.2.2. Issues that the project intended to address

From the energy point of view, Uruguay is a country that strongly depends on hydroelectricity production, whose supply shows uncertainties due to extended droughts in the country. In addition, as consequence of the accelerated economic growth, the electricity state company had to implement an investment plan for thermoelectric generation in order to face a growing demand, particularly from the industrial sector.

The introduction of electricity from thermoelectric power plants based on hydrocarbons also meant that the country would entered in an escalation of CO_2 emissions, with the further impact on global climate.

In order to face this situation, the project intended to create proper conditions for electricity generation from forestry industry remains. According to the available information at the time of project formulation, there were huge amounts of forestry industry remains in the country, which were perceived as almost unlimited, available and at almost no cost. On the other hand, this unused material presented air (due to the open air burning) and soil pollution problems (in-situ disposal).

There was also barriers that had to be removed, such as a lack of a government policy for promoting the installation and decentralized connection of biomass power plants in one side, and improvement the understanding of a viable business model for the operation of these remains from the forestry activity on the other side.

In summary, the aspects that constituted the issues identified in the project document that prevented the development of technologies for decentralized biomass power plants (forestry remains, rice husk), were the following:

i. Lack of systematized information on the amount, type and quality of biomass resources for energy purposes;
ii. Lack of information on scenarios for biomass power generation, including economic, location, availability, supply logistics and environmental aspects related with the activity;
iii. Lack of both, a general approach and an implementation plan based on quantitative information and scenarios;
iv. Lack of technical guidelines for biomass facilities, covering emissions, operation and safety;
v. Lack of clear and streamlining of permits' procedures for projects' developers and;
vi. Lack of expansion plans for the supply network, which consider the scenarios for biomass development.

2.2.3. Immediate and development objectives of the project

The project document establishes as ***development objective*** the promotion of the inclusion of biomass power generators into the national electricity supply grid, by means of development and implementation of scenarios for the sustainable and large-scale operation of wastes from local forestry and agro industries.

The long-term ***environmental objective*** was the reduction of greenhouse gas emissions from fossil fuels power generation in Uruguay, by means of promotion and development of decentralized power generation from biomass wastes and by products from the industry.

2.2.4. Expected Results

The immediate results that the project intended to achieve were the following:

i. A comprehensive assessment of the domestic forestry resources in order to be used as inputs for policies' development;
ii. Strengthening the current policy framework for electricity generation based on biomass wastes from forestry and agriculture industries;
iii. Promote among industry, investors and general public the business opportunities related with biomass power generation;
iv. Installation of a biomass power plan that supplies energy to the national grid and define a generalized replication mechanism;
v. Implement a monitoring and evaluation plan and disseminate the lessons learnt;

The project intended to achieve its objectives through the following actions:

i. A detailed inventory of forestry resources and wastes at target regions having presence of forestry resources, which would integrate into a GIS system for making enquires and correlation with geographical information;
ii. A survey among stakeholders in order to determine both potential uses and value of forestry products and wastes from forestry industry;
iii. Elaboration of environmental studies, including a strategic environmental assessment;
iv. A detailed analysis of the relevant technical, economic and management aspects for biomass energy production;
v. Development of a strategy for implementing biomass energy production and its inclusion in the National Energy Plan;
vi. Elaboration of a biomass development plan for 2 regions of the country, in collaboration with municipalities;
vii. Elaboration of technical guidelines – in consultations with stakeholders- for emissions, safety, operational and performance standards for small biomass power plants;
viii. Review of both, political and management framework for forestation, in relation with energy production from biomass;
ix. Activities of technical support in collaboration with public and private actors and universities, in order to explore the technical capacity and limitations for nationally produced equipment;
x. Dissemination through public awareness campaigns and expert seminars;
xi. Installation and technical analysis of a biomass power plant as demonstrative experience;
xii. Elaboration of a mechanism for widespread promotion of power generators from biomass, in collaboration with key public stakeholders, which includes into energy price, parameters considering environmental variables and economical and social externalities where biomass power plants are located;
xiii. A monitoring and evaluation plan for the program and capture of lessons learnt;

Table N°7: Summary of the project, its results and original Budget, according to the Prodoc.

Result	Description	N° Activities	Budget approx. (US$)
1	Detailed inventory of forestry resources and wastes for target regions	4	363,913
2	Strengthening of the current policy framework for electricity generation based on biomass wastes from forestry and agriculture industries	4	335,000
3	Promote, among industry, investors and general public, the business opportunities related with biomass power generation	3	130,000
4	A biomass power generator (5MW) has been installed, and it is supplying energy to the national energy grid; and a mechanism for its widespread replication has been prepared.	4	*130,000*
5	Implementation of a monitoring and evaluation plan; and dissemination of lessons learnt	4	60,000
6	Project Management		136,087
Total			***1,155,000***

2.2.5. Main interested parties

The interested parties associated to the project were municipalities, national forestry and agro industries, and producers of machinery and equipment needed by the process. Besides, one private investor would make the works for a power plant from forestry biomass, which would be a case for study and demonstration on feasibility of this type of enterprise.

The interested parties and also executing agencies from the Government of Uruguay, were MVOTMA (through DINAMA), the Ministry of Industry, Energy and Mining (through DNE) and the Ministry of Livestock, Agriculture and Fishing Ministry (through DGF)

2.2.6. Reference Indicators

The program established a series of indicators for the expected results, which are shown in detail in Table N°8.

Table N°8: Summary of the project expected results and its main indicators, according to the Prodoc.

N°	Result	Id_ind	Main Indicators
1	A comprehensive assessment of domestic forestry resources has been completed as input for development of policies, including a survey on market economic aspects.	A	Database of forestry biomass wastes for relevant regions.
		B	GIS application software to collect geographical information on forestry biomass wastes.
		C	Economic assessment on the commercial value of the forestry biomass resources.

		D	ESA (Environmental Strategic Assessment) on biomass waste extraction from the forestry sector, for energy generation purposes.
2	The current policy framework for electricity generation based on biomass wastes from forestry and agriculture industries, has been strengthened.	A	Knowledge on technical, economic and logistics aspects of forestry biomass collection.
		B	National strategy for use of biomass for energy generation from agro-industry, forestry and wood processing industry and agro-industry.
		C	Operation and safety guidelines for biomass facilities.
		D	Revision of the forestry policy framework on relevant issues related with energy.
3	Business opportunities related with biomass power generation have been promoted among industry, investors and public.	A	National companies involved in the construction small biomass energy plants.
		B	Promotional campaign aimed at investors, producers and public.
		C	National seminar on decentralized energy generation from biomass.
4	A biomass power generator (5MW) has been installed, and it is supplying energy to the national energy grid; and a mechanism for its widespread replication has been prepared.	A	Feasibility and final engineering studies, and contracts for a pilot biomass power generator.
		B	A pilot power plant supplying energy to the national grid.
		C	Encouragement policy instruments in place, allowing additional capacity.
		D	Detailed technical information of operational parameters for biomass plants.
5	A monitoring and evaluation plan has been implemented; and lessons learnt have been disseminated.	A	Report of the Mid-term review
		B	Terminal evaluation report.
		C	Documentation on experiences from project.
		D	Sharing of project results.

3. Findings

3.1 Project Design and Formulation

3.1.1 Logical Framework Analysis (LFA)

According to project document, the end towards the project intended to contribute was the reduction of greenhouse gases produced by power plants, thanks to the use of biomass wastes from farms and forestry industry.

The purpose of the project was "to promote the inclusion of biomass power generators into the national electricity supply grid, by means of the development and implementation of scenarios for the sustainable and large-scale operation of wastes from the domestic forestry and agro industries.

Regarding the logic frame matrix of the project and the problem analysis, it can be concluded that they are reasonably well covered by the information and knowledge available at the time of elaboration of the project.

For the indicators shown in Table N°4, it worth noting that these are more connected with products rather than results. For example, indicator "A" for Result N°1: "Database of forestry biomass wastes for relevant regions". The database is a product and therefore, a more proper indicator for Result N°1 would be, for instance: "forestry biomass wastes identified and quantified for xxx relevant regions".

In the same way, for result N°2, the indicator "B": "National strategy for use of biomass for energy generation from agro-industry, forestry and wood processing industry and agro-industry". A strategy is a product, and a more suitable indicator would be, for example: "xxx key regions implementing the strategy…."; or also " relevant institutions include the strategy into their plans and work priorities".

Lastly, an indicator for the strategic environmental objective of the project is missing, which is the amount of CO2 emissions that would be prevented thanks to the implementation of the project. In spite of the project document shows a section where these avoided emissions are calculated, the logic frame matrix does not include this important indicator.

The language used for the project components is proper and reflects the desired situation at the end of the project implementation.

The replication part is small in comparison with the size of the project, and it does not have a budget by its own neither. However, the component it is also connected with demonstrative and promotional activities considered in the project.

The original logic matrix for the results can be found in annex 8.

Table N°9: tentative examples for results and indicators.

N°	Result/example	Indicators from Prodoc	Tentative indicator for the result
1	A comprehensive assessment of domestic forestry resources has been completed as input for development of policies, including a survey on market economic aspects.	Database of forestry biomass wastes for relevant regions.	Xxx% of forestry biomass wastes identified and quantified for xx relevant regions.
		GIS application software to collect spatial information on forestry biomass wastes.	Xxx users utilize GIS application software in xxx regions.
		Economic assessment on the commercial value of the forestry biomass resources.	
		ESA (Environmental Strategic Assessment) on biomass waste extraction from the forestry sector, for energy generation purposes.	Xxx regional and communal development plans based on the ESA.
2	The current policy framework for electricity generation based on biomass wastes from forestry and agriculture industries, has been strengthened.	Knowledge on technical, economic and logistics aspects of forestry biomass collection.	Xxx standards generated from the obtained knowledge.
		National strategy for use of biomass for energy generation from agro-industry, forestry and wood processing industry and agro-industry.	Xxx% of key regions/provinces/municipalities implement the national strategy.
		Operation and safety guidelines for biomass facilities.	Xxx% companies implement the guidelines.
		Revision of the forestry policy framework on relevant issues related with energy.	Xxx standards generated from the obtained knowledge.
3	Business opportunities related with biomass power generation have been promoted among industry, investors and public.	National companies involved in the construction small biomass energy plants.	xxx% of companies taking advantages of new business opportunities promoted by the project.
		Promotional campaign aimed at investors, producers and public.	
		National seminar on decentralized energy generation from biomass.	
4	A biomass power generator (5MW) has been installed,…../Viability studies have been made and it has been shown the viability for installation of power plants, thanks to the development of encouraging policy instruments.	Feasibility and final engineering studies, and contracts for a pilot biomass power generator.	Xxx power plants installed; Xxx companies accepted the use of policy instruments.
		A pilot power plant supplying energy to the national grid.	
		Encouragement policy instruments in place, allowing additional capacity.	
		Detailed technical information of operational parameters for biomass plants.	
5	A monitoring and evaluation plan has been implemented; and lessons learnt have been disseminated.	Report of the Mid-term review	The project has been evaluated and its results have been disseminated among the interested parties for a possible replication.
		Terminal evaluation report.	
		Documentation on experiences from project.	
		Sharing of project results.	

3.1.2. Assumptions and Risks

As mentioned earlier, the project logic structure is suitable for solving the situation lay out in the project document. However, some of the assumptions that founded this logic were wrong, since the information and consensus existent at the time the project was elaborated indicated, for instance, that biomass wastes were available for its use as energy in overestimated amounts, and besides at near no cost, situation that was not real.

However, it can be deduced from the project document itself, that the available information was not complete, and postulated the need for creating a geographical database in order to quantify the biomass generated by the forestry industry and, eventually determine the real potential of the country for biomass power generation (see component N°1).

As it will be shown in the section of adaptative management, the project team managed very well this mismatch produced during the project implementation, in order to update the project contents, as much in its objectives and scope as well.

3.1.3. Lessons from other relevant projects

Even though the Probio was designed together with the eolic energy project (PEUU), this last one started in 2008. Both projects were conceived for being complementary with each other. Probio took advantage from some aspects of the experience got by the PEUU, particularly in the elaboration of decrees and biding mechanisms for electricity purchases to define its own policy instruments.

3.1.4. Replication Approach

Although the project did not have defined a specific component for replication of the experience, this approach is devised along different project components, such as promotion of activities, workshops and case studies.

3.1.5. UNDP´s Comparative Advantage

The implementation modality chosen for this project was the one of national execution (NEX), where UNDP delivers its support of financial services, purchasing experience and specific consultancies when needed (search for both, national and international experts). In addition, through its Uruguay country office analyst and the Regional Technical Adviser (RTA), UNDP makes the project follow-up, provides advice on its implementation and suggests changes when appropriate. Besides, the UNDP country officials make reviews of ToR for the different biddings calls, ensuring that each process complies with UNDP standards on quality and transparency.

For its part, MVOTMA, through DINAMA, makes the daily operations of project management and puts into service its infrastructure, technical and regulatory support needed for achieving the project goals.

National Execution is, perhaps, the most suitable way for creating in country institutional and knowledge transfer capabilities, in spite of its implementation is slower than desired, but the created capacities stay in the country, situation that increases the probability of replication in other areas and sustainability of the results obtained.

Regarding the relative advantage of UNDP as implementing agency, the most relevant would be that is physically installed in the country and, in addition, since part of its personnel is from Uruguay; there is the advantage of having an advanced knowledge on local culture, institutional procedures, its economy and country prospective. Besides, having activities from other projects, plus the international experience in the design and implementation of projects in other countries, UNDP can easily understand the reasons by which some procedures, approaches and practices may work in one country, but not necessarily may work in another country.

Lastly, UNDP/GEF project document clearly shows the roles for each participant entity and main project milestones.

3.2 Project Implementation

3.2.1. Project Activities

A detail of the activities made by the project team is found in Table N° 10. The discussion in this section will be limited to the products obtained and activities, but not in the achievement of results, whose discussion is in Section 3.3.

For the period 2011-2014, the program made the following main activities.

For Result N°1: "A comprehensive assessment of domestic forestry resources has been completed as input for development of policies, including a survey on market economic aspects".

The project team made an important study focused on identification of actors. To carry out this activity, a travel was made and meetings held with different local stakeholders in Tacuarembó y Rivera, disseminated information on the project, prepared and organized these actors in order to participate in the different project activities.

It is worth noting that the activities made with local actors were supported by DNE, DGF, DINAMA and INIA. In this way, key actors and their expectations related to project implementation were clearly identified.

At the same time, the project team systematized the regulations and information available regarding the existence of biomass wastes and, preliminarily assessed if legal, technical or biomass availability barriers existed for the use of biomass as fuels.

With this supporting basis, specialty firms were hired for making the census for the forestry industry (sawmills, plantations, wood processor plants), with the aim of elaborate the biomass availability database with its GIS module containing the geographical distribution of the resource.

An agreement with INIA Tacuarembó was also made, for making the study for characterization of forestry products.

At the time of the terminal evaluation of the project, the database is finished and the GIS module is in final testing. The database will be uploaded to the DGF website afterwards and its online sharing with other state institutions is expected by 2015.

The INIA study is at half a way of implementation, pending the sampling of half of sites and the further laboratory analysis for determining the properties of the forestry remains and its related industry (sawmills, wood processing plants).

Results of this study are expected to be available by middle of 2015.

Regarding the strategic environmental assessment (SEA), the substantive revision of the project decided change it by studies that could be used as inputs for the elaboration of a future SAE that would be made once the project is finished.

The reasons for this change were that DINAMA is just starting elaborating SAEs for several economic sectors and that from the project was a very specific an unique sub-sector, therefore its priority was lower compared to other sectors, and besides, DINAMA considered that there was not sufficient background information to start a SAE for this sub-sector. Accordingly, it was decided to make the following base studies that could serve as inputs for a forthcoming SAE: i) pollutant emissions from biomass power plants (October 2012-April 2014); ii) monitoring of air quality (March-Sept 2014); iii) baseline; iv) collection and analysis of MRV methodologies for NAMAs and estimates of potential GHG reduction emissions from the biomass energy generation sub-sector in Uruguay (Oct 2013-April 2014); v) exchange activities with other areas from DINAMA to deal with disposal and composition of ash from biomass power plants (Wastes' unit, impact and environmental control divisions and private biomass plants)and; vi) trainings for DINAMA officials and private sector employees, about emissions measurement protocols from biomass boilers and air quality monitoring plans.

For Result N°2: "The current policy framework for electricity generation based on biomass wastes from forestry and agriculture industries, has been strengthened".

It is worth noting that one of the main project activities was the elaboration of a study to analyze the results of the bidding calls made under the decree 367/010. This study consisted of interviews to companies that participated in the above-mentioned process in order to identify the factors that were generating a low private sector involvement and determine conditions for improving this participation.

The project also advised UTE on guidelines for use in the "data room" meetings (3), and made presentations to attendants of these events made prior to the biddings.

Other relevant contribution made by the project was the study that showed the positive externalities for local economies, because of electricity generation from forestry biomass (increase in activities related to biomass, use of labor, capital increases, strengthening of productive chains, energy sovereignty, etc.). Besides, it incorporated innovative concepts such as the "biomass reservoir" and "dispatch-able biomass".

A simulation of electricity generation costs from biomass was also made, using the "SimSee" software, where different scenarios for biomass introduction were tested.

The collaboration given to UTE and DNE had as result the elaboration of a new decree calling for bidding electric generation from biomass, which included, the concepts developed by the project. Signature of this decree is expected to happen either, by end of 2014 or first half of 2015.

Studies for evaluation environmental impacts from biomass-based technologies were also made (particulate matter and gaseous emissions, and ash production); and proposals for emissions and air quality monitoring standards for these type of facilities were elaborated.

With regard of elaboration of a strategy for biomass use in electricity generation, meetings were held with key actors from Tacuarembó y Rivera Departments, the foundation of the "Cluster of Wood from Tacuarembó and Rivera" was supported and it is participated on a regular basis in the meetings of the "Forestry Wood Sectoral Council" (CSFM). Besides, support was brought to the creation of the "Forest Biomass to Energy" subgroup inside of the "Commercial and Industry Association of Rivera", and supported the organization of the workshop for the elaboration of the Strategic Plan and definition of the first action lines for the "Cluster of Wood from Tacuarembó and Rivera".

Although it's true that there is no an official document for the strategy at the time for the final evaluation, stakeholders have been organized around biomass as energy issues and it's expected that the involved departments would elaborate a document of a formal strategy by 2015.

For summarizing this point, a large volume of relevant information has been generated to support the elaboration of public policies related to use of biomass as energy. This information covers the analysis of the existent policies and regulations, definition of technical parameters for operation and environmental impacts from this technology, along with specific economic studies aimed to determine tariffs and prices for electricity generation from biomass.

For Result N°3: "Business opportunities related to biomass power generation have been promoted among companies, investors and general public".

This work was 100% made by the project team. It was decided not to work with the CIU (Industry Chamber of Uruguay), since there were two technology providers among its associates, situation that created conflict of interests. The following activities were carried out: i) assessment on the current local capacity for developing equipment and services to biomass plants; ii) one workshop on "Sustainable Exploitation of Biomass for Energy Uses; iii) "Conference on Progress of Management and Production of Biomass for Energy" (Paysandú). Activities for promotion were made on a continuous basis between 2012 and 2014.

The project webpage was also created, and a series of press releases were issued, along with the organization of an initial workshop composed of thematic and energy crops workgroups.

For Result N°4: "A biomass power generator plant (5MW) has been installed, supplying energy to the national electricity grid, and a mechanism for its wide replication had been prepared".

Since the project Substantive Revision eliminated the demonstrative pilot plant component, a report on lessons learnt was prepared instead, based on experiences from three biomass power plants.

For Result N°5: "A monitoring and evaluation plan has been implemented, and lessons learnt have been disseminated".

Since medium term evaluations are not required for GEF MSP, it was decided to make a project substantive revision, in order to fit it with the current reality of use of biomass as energy.

For dissemination of lessons learnt, a nine minutes video was prepared and 500 informative brochures were printed.

Table N°10: Summary of the final situation of project activities.

Expected Result//Expected result as per the SR	Act. Id	Activity	Situation at project ending
N°1: A comprehensive assessment of domestic forestry resources has been completed as input for development of policies, including a survey on market economic aspects.	1.1	Preparation and implementation of a field survey in order to collect information on available biomass resources in Uruguay.	***For the inventory:*** i)assessment of current information systems made by the project team; ii) GIS; iii) collection of current available information and systematization of biomass stocks, made by project team; iv) census of forestry industry, made by the company Interconsult with final report on April 2014 and costs of US$ 35,000; v) key actors mapping made by the project team; vi) characterization of forestry products (INIA: US$ 190,000; 2013-2015, pending half of sites and lab analysis).
	1.2	Collected information has been analyzed y captured in a Geographical Information System (GIS), for queries and correlation with geographical information.	i) update of cartography (made by Company Aeroterra between February-April 2012, cost US$ 43,000); ii) simulation module (made by company INGESUR, April 2012-april 2014, an amendment was made to fix the module); iii) production of a visualization software to incorporate locations for biomass by-products (made by company ICA: US$ 36,000, Sept-Dec 2014). Module is near of testing and production, it is installed at an URL from DNE, it is and integrator for GIS information. It is worked with different institutions.
	1.3	A survey has been carried out among market actors (forestry industry, biomass vendors, forestry resources consumers) for determining potential uses and value of forestry products and value for biomass wastes from forestry industry.	Activity made by the project team, in collaboration with DNE, DINAMA, DGF teams and staff from privates, between Dec 2011 and March 2013. Four field tours were made and participated 3 professionals from project.
	1.4	Environmental studies for the sector have been made, including an Environmental Strategic Assessment (ESA).	The substantive revision removed the ESA, since DINAMA considered it was not a proprietary sector, besides of being too specific. It was decided, jointly with DINAMA and UNDP and based on the project substantive revision, to elaborate the following base studies aimed to be used as inputs for a forthcoming SAE: : i) pollutant emissions from biomass power plants (cost US$ 11,000, October 2012-April 2014,made by the consultant José Eduardo Pereira); ii) monitoring and air quality (cost: US$ 8,000-9,000, made between March-Sept 2014); iii) baseline; iv) collection and analysis of MRV methodologies for NAMAs and estimates of potential GHG reduction emissions from the biomass energy generation sub-sector in Uruguay (Cost: US$ 11,000, made by Adriana Torchelo between Oct 2013-April 2014); v) exchange activities with other areas from DINAMA to deal with disposal and composition of ash from biomass power plants (Wastes' unit, impact and environmental control divisions and private biomass plants) and; vi) trainings for DINAMA officials and private sector employees, about emissions measurement protocols from biomass boilers and air quality monitoring plans.
	2.1	A detailed analysis on relevant technical, economic, logistics and management aspects for forestry biomass production has been made.	Project team made the following studies between january 2012 and July 2013: i) midle and large size technologies for biomass power generations; ii) Conditions and restrictions for inter-connection to SIN of biomass power generators; iii) Quantification of positive economic externalities from forestry biomass power generation; iv) value chain of biomass transformation into fuel plant and logistic alternatives; v) development of co-generation from biomass in Uruguay; vi) Economic and financial analysis of investments for biomass power generation; vii) analysis from the energy point of view about chain balance for the electricity production from biomass; viii) approach on quantification and internalization of the environmental impact from biomass electricity generation(made by James Mahady, intern from Fulbritht); ix) State of the art analysis for the forestry sector with a global prospective (made by José Antonio casado Alcaide, cost: US$ 20,250 with training and withdrawing biomass workshop included).

Expected Result//Expected result as per the SR	Act. Id	Activity	Situation at project ending
N°2: The current policy framework for electricity generation based on biomass wastes from forestry and agriculture industries, has been strengthened.//The current policy framework for electricity generation based on biomass by-products from forestry and agriculture industries, has been strengthened.	2.2	A strategy for implementation of energy production from domestic forestry biomass wastes has been developed and it has been included into the National Energy Plan.	Project team supported: i) new decree from UTE for a new bidding call; ii) externalities, environmental impact and forestry availability analysis; iii) advice on strategic definitions from first to third "data room" events. New decree uses the innovative concept of "dispatchable biomass", as no previous records on it exits. The concept of "biomass reservoir" is incorporated, and mimics it with water reservoir used in hydroelectricity. This new decree is ready for signature and it will be public on December 2014 or January 2015. Proposals between 20-60 MWh of electricity generation are expected. Project team concluded that it had no sense calling for more MWh, since it produces distortions: if the price is too good, newcomers will compete with the existent biomass owners.
	2.3	A biomass development plan will be prepared and implemented in two different regions, with the collaboration of local authorities (municipalities).	Project team promoted the coordination and technical support for different key actors from Tacarembuó y Rivera (UPM, LATU Fray Bentos, LATU Montevideo, INIA Tacuarembó), with the aim of reporting the progress of the project and establish the use of biomass as energy in these departments. It is participated in the "Tacuarembó Wood Forum"; supported the foundation of the "Cluster of Wood from Tacuarembó and Rivera", it regularly participates in meetings of the "Forestry Wood Sectoral Council (CSFM)" and supported the found of the "Forest Biomass to Energy" subgroup inside of the "Commercial and Industry Association of Rivera", and supported the organization of the workshop for the elaboration of the Strategic Plan and definition of the first action lines for the "Cluster of Wood from Tacuarembó and Rivera".
	2.4	Guidelines stablishing emissions, safety, operation, and efficiency standards for biomass power plants have been elaborated.	The following documents were prepared: i) reference document on safety and operation of biomass plantsI ii) Proposal of gaseous emissions standards for stationary sources (made by the Gesta Aire group); iii) Reference guide on control and mitigation of atmospheric emission technologies from biomass plants.
	2.5	A review for evaluating the current policy framework referred to energy production from biomass and forestation management, including elaboration of recommendations, has been carried out. .	Three internal studies were made: laws and decrees. The is no regulations for biomass use, no incentives nor barriers for introducing uses of biomass as energy. At this moment, there is no intention to regulate the use of biomass nor energy crops neither. Regarding energy, there was a void for backup contracts, which is partially corrected.
Business opportunities related with biomass power generation have been promoted among industry, investors and public.	3.1	Technical support activities have been made, in joint collaboration with the Industry Chamber of Uruguay (CIU), covering: i) national capacity assessment of the national industry; ii) technology transfer options; iii) coordination among counterparties (industry, investors, research and government).	This work was 100% made by the project team. It was decided not to work with the CIU (Industry Chamber of Uruguay), since there were two technology providers among its associates, situation that created a conflict of interests. The following activities were carried out: i) assessment on the current local capacity for developing equipment and services to biomass plants; ii) one workshop on "Sustainable Exploitation of Biomass for Energy Uses; iii) "Conference on Progress of Management and Production of Biomass for Energy" (Paysandú). Activities for promotion were made on a continuous basis between 2012 and 2014.
	3.2	It is been implemented an informative campaign (press, broadcasting, TV) for increasing the knowledge about the biomass waste use in Uruguay.	The following activities were made: i) web page for the project (made by company TEMPUS, Comunicación y Marketing, cost: US$ 15,000, Aug-Dec 2012), updates made by Probio; ii) hosting contract for the website; iii) interviews and press articles (UGP, OPIPA Annual Publishing, reaches all sector); iv) project initial workshop with workgroups, training (Probio) and other made by the project. Probio used consultants' participation while they were in the country (aug-12-2014).

Expected Result//Expected result as per the SR	Act. Id	Activity	Situation at project ending
	3.3	It has been made a seminar about waste biomass use for energy generation in Uruguay.	The workshop "Sustainable use of biomass for energy", where subjects such as "energy crops" were shown. Made on April-2013, there was 27 attendants, INIA was the organizer; ii) closure of the project on Dec-19-2014
N°4: A biomass power generator (5MW) has been installed and it is supplying energy to the national energy grid; and a mechanism for its widespread replication has been prepared.	4.1	Activities has been made for the development of the project for a biomass power generator (5 MW), including feasibility, detailed engineering, contracts and permit studies.	Since the project Substantive Revision eliminated the demonstrative pilot plant component, a report on lessons learnt was prepared instead, based on experiences from three biomass power plants. Items 4.1. and 4.2 were made by the project team in a 100%.
	4.2	A biomass power generator (5MW) has been installed and it is supplying energy to the national energy grid, under a long term contract (ACE) with the purchaser.	
	4.3	A collaborative mechanism with appropriate government institutions has been prepared, aimed at enabling the generalized implementation of decentralized biomass power generators. .	
	4.4	The biomass pilot power plant has been monitored with regards of energy performance, operation in grid, biomass supply (including market aspects) and its impacts on GHG reduction.	
N°5: A monitoring and evaluation plan has been implemented, and lessons learnt have been disseminated	5.1	A monitoring and evaluation plan has been implemented	Since mid-term evaluations are not required for GEF MSP, it was decided to make a project substantive revision, in order to fit it with the current reality of use of biomass as energy (made by Humberto Rodríguez).
	5.2	Lessons learnt have been collected, elaborated and disseminated.	i) a 9 minutes video was prepared, where results and project impacts are explained (made by company Movmedia, cost: US$6,500); ii) short films of 3 minutes were made; iii) 500 informative brochures were printed. All is published at the project webpage. .

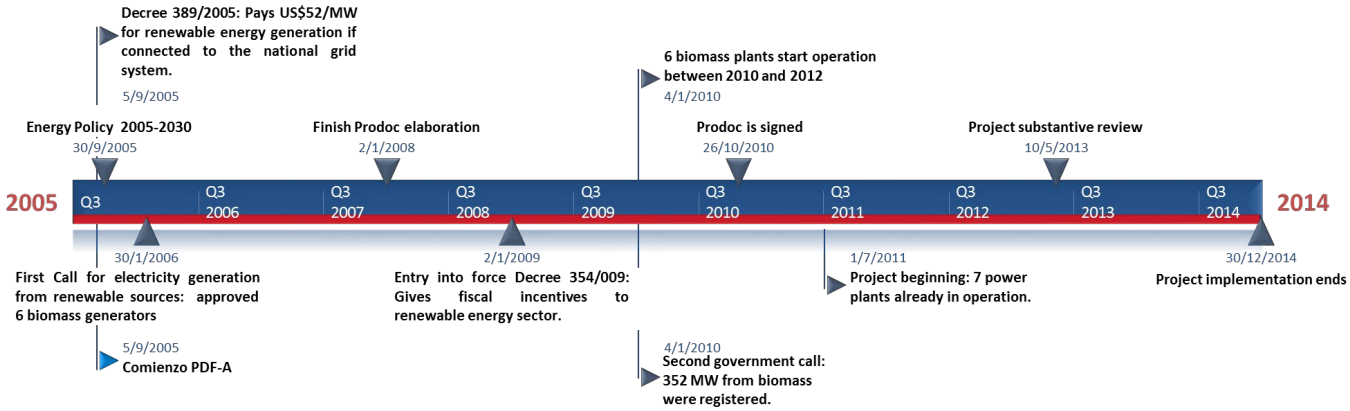
3.2.2. Adaptative Management

As detailed in Section 2.1, the country development context under which the project had to manage from its design until implementation had a series of accelerated changes from the institutional point of view and of definitions of energy policy as well.

The design of the project started in 2005 and began implementation on March 2011, this is, five years after initiated its elaboration. Reasons for this gap are found on priority given by the Government of Uruguay to the eolic project (PEUU) over the biomass project, and to the process before GEF.

Figure N°5 shows an outline of the project cycle, from its elaboration (2005-2006) until its implementation (2011-2014); revealing the main milestones from the development context occurred in the period.

Fig. N°5: Main milestones from country development context and project.



The project was elaborated with the information available in 2005 and, in the end, some concepts and appraisals were not fulfilled during project implementation, due to both special circumstances and background aspects (free biomass availability and large quantity of wastes, biomass at almost no cost and a mistaken concept for forestry waste).

It is worth noting that by 2005, the government elaborates an energy policy for the 2005-2030 period, which was eventually ratified in 2008 by a multiparty agreement. Having such a wide consensus from all country political forces, it granted large legitimacy to be quickly implemented in several aspects of the energy sector, such as strengthening of DNE and the boost of renewable energy, whose target for 2015 was having 90% of the energy matrix based on this type of energy (eolic, hydraulic, biomass and bio-fuels).

The project development context is therefore, of intense changes in the energy sector. At the same time, large investments arrived to the country, GDP increased at an average of 5% annual rate, the forestry sector experienced a deep ownership concentration of forests and improvements of forestry use technology, allowed a maximum raw material use from wood plantations, thus generating less amounts of “wastes” and limiting biomass availability.

The first temptation when analyzing this situation is consider that the project elaboration presented serious limitations, enough to go wrong with its concepts (waste, wood property),

assumptions (free biomass wastes' availability) and barriers (lack of policies for biomass development, regulatory instruments, etc).

However, after dozens of interviews with key stakeholders and analysis of a relevant amount of documentation, it can be concluded that the project was elaborated with the information existent at that moment, which had some mistaken concepts. On the other hand, after submitting the project to GEF, the government of Uruguay continued working in the development of policies and instruments for promoting the use of renewable energies for electricity production. Thus, by 2010, three call for biddings were made, with the aim of generating electricity from renewable resources such as wind, solar and biomass. As a result, by 2011 there were seven biomass power plants in operation, with an authorized capacity of about 49 MW (see table N°5, UPM and Punta Pereira are excluded, since the use "black liquor" from cellulose industry).

The project team made several activities to initiate a verification process on existing information, which included contacts with key actors located in timber industry regions (companies, research institutes, business and workers' associations, local authorities, etc.). Information on biomass regulations and structure of the wood value chain, available technologies for biomass use as energy was also collected, and assessment of the UTE bidding calls for renewable energy purchase.

Because of these consultations and studies, the project team considered necessary to update the original project indicators and results with the aim of adjusting them to the real situation, this is: i) a high concentration of the wood property and its vertical integration with wood processing companies; ii) a decreasing of biomass availability for energy purposes, since the property of wood concentration and improvement of forestry production processes, left less remains at both, wood and factories; iii) the high fuel costs; iv) the need to expand the waste concept to one aimed to a comprehensive use of biomass as energy and; vi) the need for assessment in more depth, the lessons learnt from the existing power plants, either technical, regulations developed for this economic activity (atmospheric emissions, wastes, environmental impact assessment, and development of specific environmental standards).

That is how was decided to make a project substantive revision, instead of a mid-term evaluation that was not mandatory according GRF guidelines.

This revision was made in 2013 by an external consultant, who proposed several modifications, which are shown in detail in Table N°11.

The substantive review confirmed what the project team had assessed and suggested to remove the pilot plant component, because at the beginning of the project there were seven plants installed. The above was replaced by a collection of lessons learnt gained with the experience from three of these power plants and, in addition, it replaced the "waste" concept by "by-products" in order to reflect the improvement of the forestry use by the industry.

For Result N°1, the ESA was deferred until project ending with no deadline, since DINAMA considered it was not prepared for making this assessment, besides of being not an institutional priority. Instead of ESA, it was jointly decided with DINAMA and UNDP, to elaborate base studies aimed to be used as inputs for a forthcoming ESA. However, the evaluator's opinion about this type adjustment is that a reasonable deadline for making this activity should also be mentioned.

For Result N°2, the indicator "Operation and safety guidelines for biomass facilities" was replaced by the elaboration of local plans for biomass development, in coordination with authorities and interested parties (local and national). New indicators were added, related to the elaboration of technical guidelines on emissions, safety and operation of biomass power plants.

Other concepts, either changed or introduced, were that of "distributed generation" replaced by the one "sustainable biomass use for energy", which certainly broaden (theoretically) the project scope to the use of any kind of biomass for energy purposes, beyond to what stipulated the original project, which was limited to electricity production. This change was appropriated, taking into account the serious restrictions for using forestry by-products, which almost reached the limit for its use, because of the concentration of the forestry property.

For the Result N°3, it was decided to focus the dissemination activity on groups of companies and stakeholders involved in the subject, going beyond the public. It was also decided that focalization centered on the project's industrial stage (power plants) was limited, and it would be better to include the operational stage and its servicing and logistics components, due to the positive economic externalities are present in this operational phase.

For Result N°4, the pilot plant was dropped (there were seven at project beginning) and changed by case studies on the experience obtained by three power generators, including technical, economic and good practices aspects for each company.

For Result N°5, project the mid-term review was dropped and it was replaced by the substantive revision. Although the mid-term evaluation nowadays is not mandatory for mid sized projects, it is not seem advisable to withdraw the indicator from the project. Most proper could be to explain the reason by which such evaluation was not made. Besides, the new indicator (project monitoring completed) does not shed light about the importance of the evaluations.

In general, during the substantive revision, the sense of some project important concepts were changed (waste to by-product and biomass waste to biomass) and many indicators and objectives also changed (for example, the 5 MW pilot plant).

The above changes are fully justified, considering the analysis made in the above sections of this report about the real situation of biomass in Uruguay and its quick development. However and as good practice concept, indicators should not be changed, but it is better to explain why an objective or indicator cannot be accomplished, nor statement should be made referring that an objective was achieved (lengthily in this case) before starting the project or program.

From the point of view of the evaluator, the situation is clearer and simple when reasons are explained, because in this way it can be concluded what it worked, or was over or under estimated. When changing indicators and objectives, it can be wrongly concluded as an attempt for adjusting the project/program to a special situation.

As final statement for this section, the new indicators elaborated for the program, had the same flaws from the original project, this is, they resemble products rather than results.

Table N° 11: Summary for changes made by the project substantive revision.

Element Id	Original element	Original modified element	Element type	Component/Result affected by changes
A	Distributed electricity generation using *forestry biomass wastes*, supplying to the national grid.	Distributed electricity generation *using biomass*, supplying to the national grid.	Objective indicator for the program.	Across all project document.
C	*Forestry biomass wastes* database for relevant regions.	*Forestry biomass* database for relevant regions.	Objective indicator for the program.	Result 1
A	*At least one 5MW biomass power generator,* operating under a long-term ACE contract.	Biomass power generators in operation, have a long term PPA contract, with an additional capacity of 30 MW in process. By July 2011, the installed capacity reached 65 MW.	Objective at the end of program.	Result 4
A	*Forestry biomass wastes* database for relevant regions.	*Forestry biomass* database for relevant regions.	Result Indicador.	Result 1
B	GIS application to collect geographical information on forestry biomass wastes.	GIS application to collect geographical information on forestry biomass.	Result indicator	Result 1
D	*An ESA* has been carried out for the entire *forestry sector*.	*Environmental studies* for the entire forestry sector have been made, to be used as inputs for the decision taking process and a *Sectoral Environmental Assessment will be made after* project completion.	Objective at the end of result	Result 1
Result 2	The current policy framework for electricity generation based on *biomass wastes* from forestry and agriculture industries, has been strengthened	The current policy framework for electricity generation based on *biomass by-products* from forestry and agriculture industries, has been strengthened.	Result	Result 2
A	Lack of knowledge on economic, technical and logistics aspects of *forestry biomass waste collection.*	Lack of knowledge on economic, technical and logistics aspects of *forestry biomass by-products collection*.	Baseline	Result 2
B	The *distributed biomass power generation* is being facilitated within the framework of the national strategies of energy policies.	The sustainable *use of biomass for energy* is being facilitated within the framework of a national energy policy and strategies.	Objective at the end of result.	Result 2
C	Operation and safety guidelines for *biomass facilities.*	*Plan for local development of sustainable use of biomass for energy purposes, in collaboration with local and national*	Result indicator	Result 2

Element Id	Original element	Original modified element	Element type	Component/Result affected by changes
		authorities.		
D	It did not exist in prodoc	*Emissions, operation and safety guidelines for biomass facilities.*	Result indicator	Result 2
C	It did not exist in prodoc	*There is no a wide sectoral plan for sustainable use of biomass.*	Baseline	Result 2
C	It did not exist in prodoc	*Sustainable use of biomass for energy purposes is being facilitated through coordinated local and national strategies, supported with studies and guidelines for the decision making process.*	Objective at the end of result.	Result 2
A	National companies involved in the construction of small biomass power plants.	*Technical support activities in collaboration with private sector (metallic infrastructure sector, logistics and servicing companies.*	Result indicator	Result 3
B	Promotional campaign aimed at investors, makers and public.	*Promotional campaign for investors, about increasing the knowledge on sustainable use of biomass for energy purposes and focused on equipment and servicing providers and public.*	Result indicator	Result 3
C	National seminar on *decentralized biomass energy generation*.	National seminar on *biomass use for energy purposes* in Uruguay.	Result indicator	Result 3
A	Companies producing metallic godos are making boilers and containers for biomass plants, according specifications, design and limited engineering capacity.	*There is no clear guidelines and procedures for investment projects of biomass energy generation.*	Baseline	Result 3
A	Enhanced design and engineering capacity, more involvement of national equipment providers (objective: 3 companies).	*Support has been brought to all investors, about the added value chain (plant construction, supply logistics, energy developers) of biomass power projects.*	Objective at the end of result.	Result 3
D	Detailed technical information on operation parameters of *distributed biomass power plants.*	Detailed technical information on operation parameters of *distributed biomass plants*.	Result indicator	Result 4

Element Id	Original element	Original modified element	Element type	Component/Result affected by changes
D1	It did not exist in prodoc	*3 case studies including an in Deep review of project engineering, construction, start-up and operation stages for biomass energy generators.*	Result indicator	Result 4
D2	It did not exist in prodoc	*Operation, energy performance, biomass supply and emissions (including GHG) monitoring, for plant supplying electricity to the national grid.*	Result indicator.	Result 4
A	Feasibility studies completed, technical designs, contracts and permits concluded for the planned pilot plant.	*Made at the effective beginning of the project.*	Objective at the end of result.	Result 4
B	A 5 MW biomass power plant providing energy to the energy grid supply.	*Made at the effective beginning of the project.*	Objective at the end of result.	Result 4
A	*Mid-term evaluation* report.	*Project monitoring and evaluation plan.*	Result indicator	Result 5
A	MTE completed	*Project monitoring completed.*	Objective at the end of result.	Resultado 5

3.2.3. Partnership Agreements

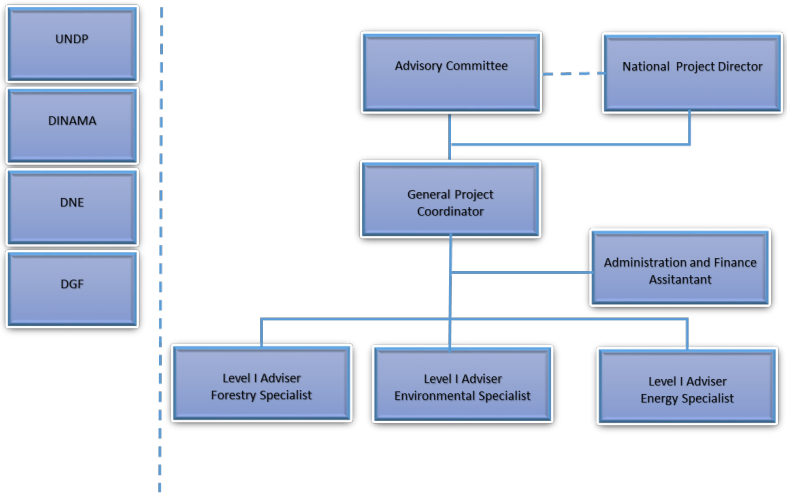
The project was implemented under the national execution (NEX) modality, which has undeniable benefits of strengthening both, institutional and human resources for multilateral supported recipient countries.

The MVOTMA, through DINAMA, was the entity responsible for execution of Probio.

The approved institutional arrangement includes a project steering committee where participated DINAMA (on behalf of MVOTMA), DNE (MIEM), DGF (MGAP) and the UNDP country office. This committee worked on a stable basis during project implementation and its discussions were of strategic nature.

The project team consisted of one coordinator, three sectoral specialists (energy, forestry, environment and one economist) and one secretary. Fig. N°6 shows the way by which this project was organized.

Fig. N°6: Organization chart for implementation of the project[19].



The sectoral specialists worked located in each of the involved ministries, thus being part of them. This institutional arrangement was extremely important for the project success, since as being located in each institution, the specialists had quick access to relevant information and, more important, they made project activities that were also in line with each entity's priorities.

This mode of operation is more complex to implement, since specialists have to respond to both, the project director and heads of each involved institution, but it achieves a higher commitment and institutional strengthening.

The project team also made institutional arrangements with other institutions in order to facilitate project implementation and introduce the biomass issue among regional and national actors. It is worth noting that the project participated in meetings of the "Tacuarembó Wood Forum", supported the foundation of the "Cluster of Wood from Tacuarembó and Rivera" and regularly

[19] *Esquema elaborado por el Equipo de Proyecto*

participates in the meetings of the "Forestry Wood Sectoral Council (CSFM)". Besides, it supported the creation of the "Forest Biomass to Energy" subgroup inside of the "Commercial and Industry Association of Rivera" and the organization of the workshop for the elaboration of the Strategic Plan and definition of the first action lines for the "Cluster of Wood from Tacuarembó and Rivera".

It also made an agreement DINAMA-INIA Tacuarembó, aimed at making the characterization of forest remains for estimating the quantity and energy value of these forest by-products from wood harvest.

3.2.4. Monitoring and Evaluation: design at entry and implementation

Regarding project monitoring, the prodoc stipulates that the project unit will present a detailed plan for M&E. The first aspect to point out was the implementation of the Initial Workshop, where the project and its objectives were explained, and stakeholders have the chance to give clarifications about the biomass specific situation in Uruguay. Besides, there were special meetings with local and national actors, where the project team could internalize better the different situations that the project had to confront.

On the other hand, on its first meeting, the project steering committee decided to make official a project-monitoring group, composed by DINAMA, DGF and DNE officials, whose specific task was to interact with the project unit, in order to verify the progress on operative issues, but with no decision making capacity.

The project team elaborated its annual work plans with specific milestones and progress for each project activity. Annual progress reports were also made, including steering committee meetings (in 2011-2012 the committee met twice a year, whereas in 2013-2014 once a year).

Regarding the quality of operational plans and its follow-up, it is noted that they are very detailed and comply with UNDP standards, as much in scope, details and formatting.

Annual work plans are in line with both, the steering committee guidelines and the new information provided by the studies made and interaction with stakeholders.

Among the monitoring tools used by the project, it can be found the Project Implementation Reports (PIR), Annual Project Reviews (APR), Annual Operational Plans (AOP) and the Annual Work Budgets (AWB). From steering committee meeting acts, it can also be noted the use of the project logic framework for planning and adjusting of activities, in order to align them to the current country reality and involved institutions. During the adjustment period, significant changes to the project and its indicators had to be made, as discussed in section 3.2.2.

3.2.5. Project Finances.

The project document stipulated an in-cash global budget of US$ 1,155,000 with a GEF contribution of US$ 950,000, US$ 25,000 from UNDP and US$ 180,000 from the Government of Uruguay. In-kind contributions would reach US$ 595,000 and investments made by a private company for construction of a biomass power plant, would be US$ 6,750,000. The implementation would last three years, that is, between 2011 and 2014.

The project team made annual budget planning (OAP, PAT) that were approved by the project steering committee and sent to UNDP for approval. Expenditures were complied with UNDP standards for purchases, consisting of settlement of expenses for advanced payments and sending of Terms of Reference (ToR) for main procurements (consultancies, equipment, etc). UNDP checks and approves purchases and consultancies ToRs, and makes the calls for biddings according its internal rules.

Besides, the project team annually reported on progress of activities and expenditures made. In 2013 an independent audit for the 2012 project expenditures was made, whereas in 2014 a "F revision" was carried out, both process concluding that procurements are made according UNDP standards[20].

It is worth noting that all expenditures complied with the institutional formalities required by DINAMA, DGF and DNE.

Table N°12, shows a summary of the expenditures made per project activity[21] until October 2014. Payments remaining are those for the project terminal evaluation and INIA, which will be at expense of the government contribution from MVOTMA, since GEF funds are fully spent.

Comparing with the original project budget is noted that there are noticeable differences between that planned during the project elaboration and what was made afterwards.

As discussed in earlier sections, strong project adjustments were made in order to align it to the real biomass situation in the country, being these reflected in the expenditures. All project components had budgetary modifications, mainly the N°1 (forestry resources assessment) wihch incremented its expenses by 35%, followed by Result N°5 (management and monitoring) with an 84%.

Result N°6 was not included in the project document, and responds to the need of creating this item for the project team coordination and management.

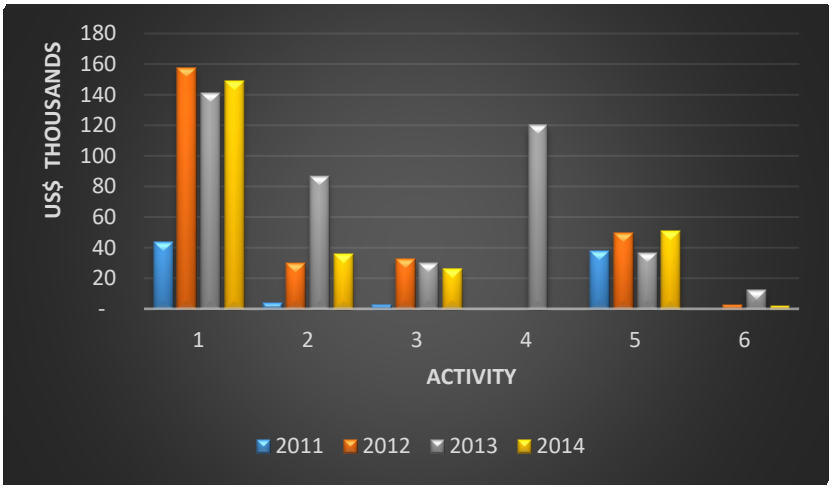
Table N°12: Project total expenditures in US$ thousands until October 2014. The original project budget is also shown for indicative purposes.

Activity	Budget					Actual expenses									
	2011	2012	2013	2014	Total	2011	%	2012	%	2013	%	2014	%	Total	%
1	9,8	159,2	127,7	66,9	363,5	43,6	447	157,4	99	141,3	111	148,8	222	491	135
2	4,0	87,8	144,6	98,6	335,0	3,9	97	29,9	34	86,9	60	35,9	36	157	47
3	1,5	34,0	52,9	41,6	130,0	2,4	162	32,9	97	30,3	57	25,9	62	92	70
4	-	30,8	60,3	39,0	130,0	-	-	-	-	120,0	199	-	-	120	92
5	11,0	29,6	30,6	23,8	95,0	37,9	345	49,5	167	36,9	120	51,0	215	175	184
6	-	-	-	-	-	-	-	2,3	-	12,2	-	4,5	-	19	-
Total	26,3	341,3	416,1	269,9	1.053,5	87,8	-	272,0	-	427,5	0	266,1	-	1.054	100

[20] See "Informe de auditoría independiente correspondiente al período comprendido entre el 1° de enero y el 31 de diciembre de 2012"; Delloite; 2013

[21] From UNDP ATLAS until October 2014.

Fig. N°7: Progress on project expenditures for 2011-2014



Regarding co-financing commitments, these have been complied by both, the government of Uruguay and the private investor, being this last one higher than committed. Table N°13 shows a summary of the project co-financing situation.

Table N°13: Actual co-financing (US$ thousands)[22].

Tipo/Fuente	UNDP (TRAC)			Government			Private sector		
	Planned	Actual	%	Planned	Actual	%	Planned	Actual	%
In cash	25	25	100	180	180	100	-	-	
In kind				595	581,89	98	-	-	
Investment							6,750	30,000	444
Total	25	25	100	775	761.89	98.3	6,750	30,000	444

3.2.6. Implementation and Coordination

As it was explained in above sections, main project partners were DINAMA, DNE, DGF and UNDP country office, with who the project steering committee was conformed. In addition, an operative follow-up committee constituted (no decision taking capacity) by officials from different institutions verified the progress on project activities.

The project appointed own personnel to work inside of the involved institutions, situation that, as seen in further sections, gave a strong boost on project ownership of "host" institutions.

The project team also coordinated with UTE for discussion of bidding decrees for energy purchases and elaboration of studies about tariffs and positive externalities on local economies derived from biomass power plants.

In addition to the above, there were coordination and discussions with business and local organizations related to forestry industry from involved regions, in order to boost the use of

[22] In-kind contributions calculated by the project team and referred to use of facilities, acquisitions, institutional services and work hours from professional and technical staff.

biomass as energy ("Cluster of Wood from Tacuarembó and Rivera" and "Forestry Wood Sectoral Council (CSFM)").

One of the UNDP country office activity was the administration of project funds through its accounting system and advice the project team on standards and good procurement practices, in order to ensure the bidding success. UNDP makes an intense control over procurement processes, some of them requiring the approval from UNDP Panama office, for purchases higher than US$ 100,000.

Besides supervising budget and project expenses, UNDP was also in charge of selecting and hiring national and international experts, supervision of the independent financial audit for insuring the proper use of funds, the substantive revision and the terminal evaluation of the project.

On the other hand, UNDP made available to the project team, a Regional Technical Adviser (RTA) and shares its experience on other similar projects implemented in other countries. The RTA also contributes with information on subject relevant experts. The UNDP country office has been in charge for channeling this support from the RTA, who is located in Panama.

Besides, the RTA has been the nexus between the GEF and the country and has the mission of reporting the project progress before different GEF instances.

The UNDP country office also an agreement facilitator among actors, and makes available to project its prestige as UN agency and infrastructure. It also makes the project follow-up and attends the project coordination meetings, providing qualified personnel for this sensitive task.

According to interviews, there is a good perception among actors about UNDP role in this project.

3.3 Project results

3.3.1. General results (achievement of objectives)

According the evaluation methodology of GEF funded projects from cycle 4 onwards, projects' results should be revised with indicators and relevant monitoring tools.

Beyond of what discussed in earlier sections about the logic framework structure and changes made to the project, from the prodoc reading, some elements that allow a better understanding about project objectives can be deduced.

In first place, the ***project global environmental goal was to avoid CO2 emissions*** from fossil fuel power generation plants. Despite of this objective was not attained within the project implementation timeframe, it can be stated that it ***is highly probably to reach this goal once project activities end***, thanks to project support to the elaboration of UTE's bidding decree, by which contracts for 60 MW of installed power from biomass are expected. These biomass facilities will be installed after the project finishes. This result will largely exceed the 5 MW power plant established in the prodoc.

On the other hand, the ***project development result*** was "***to promote the integration of biomass-based power generators into the national electricity grid, through the implementation of scenarios*** for sustainable and large-scale exploitation of domestic forestry biomass resources".

Regarding this point, it can be stated that ***this objective is completely achieved***, since project generated a large amount of technical and economic studies that justify the installation of forestry biomass power plants into specific niches where they would be competitive. Besides, it elaborated the analysis that allowed UTE to adjust its energy generation simulation model in order to incorporate biomass into its internal parameters, and helped to fix the decree of call for new renewable energy bidders rather than encouraging, to a major extent, those privates interested in participating with biomass-based energy.

The project generated participation scenarios for local and national actors, who were coordinated; supported the organization of discussion meetings about biomass, provided relevant technical and financing information for biomass power generation business and besides, it showed the positive externalities of these power generation plants on local economies.

The studies made revealed that the understanding existing during project elaboration, about forestry biomass wastes among actors and authorities – regarding quantities, limitless availability and almost zero cost -, was not real since many structural and technological changes in the forestry chain took place. These changes reduced biomass availability and showed logistical costs involved in the collection, transport and its conditioning for use as fuel.

Consequently, the project ***contributed in generating a context of higher certainties about the use and situation of biomass in Uruguay***, allowing authorities and investors have a solid basis for elaborating estimates and policy instruments, improve environmental controls for existing biomass facilities and rise certainty in the decision process of all involved actors.

Another important achievement has been ***the institutional strengthening left by the project***. One of the most innovative elements was the hiring of personnel who worked at DNE, DINAMA and DGF offices, in such a way that they could implement project activities from within of each institution, so making these entities to assume the work done as its own, and take the new knowledge generated by the project.

Another key factor for project success and its ownership by the involved institutions, was the definition of roles and duties for each one from the very beginning, with due respect of the established institutional mechanisms for the project decision-making process.

As a summary of the analysis for the results, Table N°14 shows the final situation of the project, in regard of objectives and desired results, as compared with the baseline (2005).

Table N°14: Summary of progress on achievement of project objectives.

Project Purpose: contribute to reduction of GHG that cause the global climate change.						
Goal/Objective/Result	**Performance indicator**	**Baseline**	**Desired goal at project ending**	**Current situation at project ending**	**Comment from terminal evaluation**	**Rating**
Environmental objective: reduction of greenhouse gas emissions from fossil fuels power generation in Uruguay, by means of promotion and development of decentralized power generation from biomass wastes and by products from the industry.	Direct emissions are related with the construction of a biomass power plant with a 5MW capacity. Indirect emissions will take place as a result from market changes, due to activities of barriers' removal and demonstration of sustainable business models. Direct benefits are estimated in 320,000 CO2 tons avoided though the economic life cycle for the investment (20 years), associated to production of 570,000 MW (570 GWh).	***At the time of elaboration of the program*** (2006), there was only 30 MW of power generation from biomass. ***At the beginning of program implementation,*** there was already an installed capacity of 63MW.	Avoided 320,000 CO2 tons in 20 years	Avoided CO2 emissions will be effective upon signature of contracts among UTE and companies awarded in the last call for bidding, scheduled to happen by first half of 2015. Contracts for 60 MW are expected and avoided CO2 emissions thanks program activities, shall be several times higher than envisaged for this objective.	Due to the quick renewable energies' development, thanks to policy instrument elaborated by the GoU, at the beginning of the project there were already in operation, 7 biomass power plants. The program generated a scenario of information, participation of stakeholders and improvement of policy instruments for boosting this type of technology, whose results will be effective once the program is complete.	HS
Development objective: promotion of the inclusion of biomass power generators into the national electricity supply grid, by means of the development and implementation of scenarios for the sustainable and large-scale operation of wastes from the local forestry and agro industries.	i) Database of forestry biomass wastes for relevant regions; ii) GIS application software to collect spatial information on forestry biomass wastes; iii) encouragement policy instruments in place, allowing 100 MW of additional capacity; iv) operation and safety standards for biomass facilities.	i) there is no a distributed power generation, making use of afforestation biomass wastes; ii) recent decrees invited companies small ad-hoc biomass projects; iii) there is no available information for planning purposes, about forestry biomass; iv) there is no clear guidelines to fulfill environmental, safety and operational standards for biomass facilities.	**i) Biomass power generators in operation have a long – term contract (PPA), with an additional capacity of 30 MW in progress. By July 2011, the installed capacity reached 65 MW**; ii) a series of policy tools has been elaborated and implemented, enabling a wide use of biomass energy in Uruguay; iii) detailed information on biomass resources has been collected; iv) proper technical guidelines have been elaborated and implemented on key aspects of distributed biomass power generators.	i) and ii); database updated and completed by project ending, just pending a module for displaying geographical data and a system for sharing data among several government institutions; iii) among policy instruments is the UTE's decree calling for energy purchase bidding, where additional 60 MW of biomass power is expected after project completion.	During the substantive revision, the concept of "biomass waste" was removed, leaving only the wider concept of "biomass". The indicator of the 5 MW pilot plant was also eliminated and replaced by objective i) (in red), which was already surpassed when program started.	S
Result N°1: A comprehensive assessment of domestic	i) Database of forestry biomass wastes for relevant regions; ii) GIS application	i) there is no available information for planning purposes, about forestry	i) detailed information on biomass resources has been collected; ii) a proper GIS	i) and ii) database updated and completed by project ending, just	The project gathered new information that enabled a more detailed assessment	S

Goal/Objective/Result	Performance indicator	Baseline	Desired goal at project ending	Current situation at project ending	Comment from terminal evaluation	Rating
forestry resources has been completed as input for development of policies, including a survey on market economic aspects	software to collect spatial information on forestry biomass wastes; iii) Economic assessment on the commercial value of the forestry biomass resources; iii) ESA (Environmental Strategic Assessment) on biomass waste extraction from the forestry sector, for energy generation purposes.	biomass; ii) GIS application in use at DGF, but does not include forestry biomass wastes, nor logistic/economic parameters; iii) lack of vision from economic motivators behind the products and waste market; iv) there is no SEA available for the sector.	module has been implemented, linking biomass information with technical and economic parameters; iii) a report for policy makers; iv) environmental studies for the forestry sector as a whole has been made, in order to be used as inputs for the decision making process, and a SEA will be made after project is completed.	pending a module for displaying geographical data and a system for sharing data among several government institutions; iii) in cooperation with INIA, a study for characterizing forestry biomass remains is underway, half pending; iv) environmental studies jointly made with DINAMA are completed.	the real situation about forestry and timber industry remains, identifying niches where it could be competitive. The SEA was removed during the substantive revision, since DINAMA was not prepared for carrying out such an assessment.	
Result N°2: The current policy framework for electricity generation based on biomass wastes from forestry and agriculture industries, has been strengthened.	i) knowledge on technical, economic and logistics aspects of forestry biomass collection; ii) Plan for local development of sustainable use of biomass for energy purposes, in collaboration with local and national authorities; iii) Emissions, operation and safety guidelines for biomass facilities.	i) Lack of knowledge on economic, technical and logistics aspects of forestry biomass by-products collection; ii) There is no a wide sectoral plan for sustainable use of biomass; iii) Revision of the forestry policy framework on relevant issues related with energy.	i) suitable determination of key parameters to assess costs and restrictions; ii) Sustainable use of biomass for energy purposes is being facilitated through coordinated local and national strategies, supported with studies and guidelines for the decision making process; iii) The sustainable use of biomass for energy is being facilitated within the framework of a national energy policy and strategies.	Project made the studies to assess technical and economic variables for biomass power generation. Study with INIA for characterization forestry biomass remains are still underway; and supported national and regional organizations for elaboration of biomass strategies.	The substantive revision changed indicators to extend both, the concept of "wastes" to "by-product", and project scope as support for development of strategies.	S
Result N°3: Business opportunities related with biomass power generation have been promoted among industry, investors and public.	i) technical support activities in collaboration with the private sector (metal manufacturers, logistics and servicing companies); ii) promotional campaigns to expand the knowledge about sustainable use of biomass for energy purposes; among investors and focused on	i) There is no clear guidelines and procedures for investment projects of biomass energy generation; ii) there is a lack of knowledge on biomass business opportunities; iii) the is a lack of knowledge exchange on energy	i) Support has been brought to all investors, about the added value chain (plant construction, supply logistics, energy developers) of biomass power projects; ii) a wide promotional campaign has increased the knowledge about biomass, among public	Project has elaborated a series of technical, environmental and economic guidelines. Dissemination workshops have been made; it had published of material at the project webpage and elaborated printed and multimedia	Result indicator was changed by the substantive revision.	S

Goal/Objective/Result	Performance indicator	Baseline	Desired goal at project ending	Current situation at project ending	Comment from terminal evaluation	Rating
	equipment providers and servicing companies, and public; iii) national seminar about sustainable use of biomass as energy in Uruguay.	production from biomass.	and drawn attention of investors and makers; iii) a national seminar about biomass development, has gathered together experts and interested parties	material.		
Result N°4: A biomass power generator (5MW) has been installed and it is supplying energy to the national energy grid; and a mechanism for its widespread replication has been prepared.	i) Feasibility and final engineering studies, and contracts for a pilot biomass power generator; ii) A pilot power plant supplying energy to the national grid; iii) Encouragement policy instruments in place, allowing additional capacity; iv) Detailed technical information on operation parameters of distributed biomass plants; v) 3 case studies including an in Deep review of project engineering, construction, start-up and operation stages for biomass energy generators; vi) Operation, energy performance, biomass supply and emissions (including GHG) monitoring, for plant supplying electricity to the national grid.	i) preliminary assessments for the private pilot plant under consideration, have been made; ii) biomass power plant at pre-feasibility stage; iii) recent decrees invited companies to present small ad-hoc biomass projects; but incentives are not continuous, there are several tax based incentives; iv) there is a lack of information and experience in Uruguay, about performance of small biomass power plants connected to the electricity grid; v) lack of information about the implementation of biomass power plants' projects; vi) there is a lack of information on performance and emissions from biomass power plants.	i) already made at project beginning; ii) a policy framework enabling a wide implementation of biomass power plants, in a longer timeframe; iii) detailed field information regarding operational safety, shipment, GHG benefits, economy and biomass energy generators' reliability has been collected.	All studies have been carried out. The pilot plant was changed by a study analyzing the experience of 3 biomass power plants.	Substantive revision changed the goal, leaving it as reached at the beginning of the project.	MS
Result N°5: A monitoring and evaluation plan has been implemented, and lessons learnt have been disseminated	i) project monitoring and evaluation plan; ii) terminal evaluation report; iii) documentation of project experience; iv) sharing of project experiences.	i) there is no MTE; ii) there is no TE; iii) there is no systematization about lessons learnt for biomass plants in Uruguay; iv) there is no sharing of experiences in LA Region.	i) project monitoring completed; ii) TE finished; iii) publication of lessons learnt; iv) seminar for presenting project results.	Project stages finished, with terminal evaluation in progress.	Substantive revision dropped the MTE, since it was nor needed for MSP.	S

3.3.2. Relevance

Probio is included in the GEF-4 Operational Program and it was aimed to reach the Strategic Objective N°4: “to promote renewable energy into the supply grid”, where the Strategic Program N°4: “to promote sustainable energy production from biomass” is located. The expected result for this strategic program was the “adoption of modern and sustainable practices for the production, conversion and use as a modern energy”.

Regarding of the country international commitments, the program is within the UN Framework Convention on Climate Change (UNFCC) ratified by Uruguay in 1994, and in the Kyoto Protocol ratified in 2001.

The program is also in the context of the 2005-2030 Energy Policy, which in its objective N°5 stipulated the promotion of renewable energy, including biomass. Besides, for the short term goal (2015), a share of 15% of power generation of non- conventional renewable energies (eolic, biomass wastes and micro-hydraulic power plants) is expected.

Lastly, the program is also included in the UNDP country program 2011-2015, National Priority 2:”make progress to sustainable development models that ensure the conservation of natural resources and ecosystems, the mitigation and adaptation to climate change and use of renewable energies”, whose specific indicator is “Percentage of non-conventional renewable energies in the national energy supply”. It is worth noting that the UNDP Country Program agrees with the four 2011-2015 UNDAF priorities for Uruguay.

The program has been relevant for the institutional strengthening and ownership by main stakeholders involved, thanks to a participative scheme and installation of the biomass subject trough the hiring of its own specific personnel inside the DGF, DNE and DINAMA.

The program has also been relevant for both, private and public sectors, since it has produced important information for policy development about biomass (quantities, localizations, material quality for energy, investment and operating associated costs, positive external on local economies, ect.); and it also provided technical and economic information to the private sector, about the biomass viability as energy source.

3.3.3. Effectiveness and Efficiency

The project development objetive was one of promoting the integration of biomass power generators into the national supply grid. This objective would be reached through the development and implementation of scenarios for the sustainable use of forestry biomass. In this way, as discussed in Section 3, Probio has been effective in generating relevant technical and economic information that influenced the elaboration of UTE's decrees for biding, which have included the necessary incentives to enable the entry of new actors from forestry biomass for electricity generation.

Besides, the program was very effective in introducing the subject into the public sector (thanks to ad-hoc professionals hired for DNE, DINAMA and DGF and the participative approach with all involved actors). The same counts for the private sector, thanks to the participation of the program with business associations and national and local development organizations.

Regarding efficiency, the program has kept reasonably well in the limits of both, available resources and program schedule, in despite of its extension for one year (common situation for most GEF projects that this author's report have evaluated before).

Regarding the amount of avoided CO2 emissions, no direct reductions were accomplished as a result from the implementation of the program. However, this goal will be met in the medium term, since there is interest of participating in the UTE's bidding process, which will happen by first half of 2015. Interest for a 60 MW of installed capacity from private investors has been identified.

3.3.4. Country Ownership

As was mentioned earlier, the project and its elaboration have been in hands of local institutions and professionals - supported by some external consultants-, who developed the different studies and concepts that should be implemented in the country.

The country has been strongly involved in the subject of biomass as no-conventional energy source and Probio responded to the country priorities. As an example, the implementation of the 2005-20130 energy policy, the strengthening of the forestry geographical system and improvement of DINAMA's national environmental management system, by incorporating relevant technical information for this type of energy into the environmental impact assessment and therefore, being the basis for the regulatory instruments for DINAMA.

An indicator on the level of the country involvement, is the incorporation of part of the project team to the DNE staff; the inclusion of biomass issues in the UTE's energy simulation software and the participation of the DNE in the discussion of the decrees for bidding process of energy purchase, and the database maintenance given by DGF.

3.3.5. Mainstreaming

Regarding Probio integration with other initiatives, it can mention that it is complementary with the eolic energy project of Uruguay and it can be associated with poverty reduction goals, thanks to its analysis and promotion about the positive externalities on local economies from biomass power plants. Besides, this project has been strongly linked to improvements of forestry resources and its potential use as energy. In terms of gender, the project does not contain any mention nor specific results in this regard, but during its implementation, the work teams created had an equitable gender quota.

The project is in line with the following 2011-2015 UNDAF results: a) 1.1.d: "the country had designed policies and actions for diversifying its production structure and promote trade and investments with the aim of improving its international inclusion in an equitable and sustainable way ", b) 1.2.: "the country had promoted technological innovations into the production structure", c) 2.2.: " The government - with the civil citizenship - has designed and implemented departmental and national plans for responding to climate change and disaster risk prevention and reduction" and, d) 2.3.: "The government with participation of civil society will continue increasing of sustainable and renewable energy generation and the responsible and efficient energy use, thus promoting access to all social sectors and climate change mitigation".

Regarding the 2011-2015 UNDP Country Program for Uruguay, the project can be included in the following work lines: q) 1.: " support the production diversification and country global inception, the increase of production investment and growing inclusion of science and technology in production processes. Actions made in collaboration of UN bodies, the government, private sector and civil society from Uruguay, try to contribute to national, sub-national and local equitable and sustainable development model.", and b)2.: "to progress to sustainable development models able to ecosystem and natural resources conservation, the mitigation and adaptability to climate change and the use of renewable energy sources".

3.3.6. Sustainability

Sustainability of Probio results will depend to the success of the bidding for purchasing energy by UTE and the development of specific incentives for biomass use as energy in particular niches identified as viable by the project. It worth noting that concentration of forestry woods and its by-product use are ensuring biomass availability for power plants associated to these woods, thus it is reasonable to expect that these companies will continue producing energy (seven actually, from which two are cellulose plants).

On the other hand, the knowledge got by the project has been disseminated on public and private institutions, who perceive Probio as an unavoidable reference for biomass issues in Uruguay. Thanks to this, local development organizations are including biomass as part of its work and institutional strategies.

The program steering committee had its closing meeting on December 2014, from which the main conclusion was its intention to grant sustainability to program results, mentioning a new GEF funded project -called "Biovalor"- as a continuation of the lines of work drawn by Probio, in order to make a sustainable use of waste and biomass by products from agroindustry.

Besides, the steering committee declared that the main human resources developed and trained by Probio, will continue linked to the national directorates that participated in the program[23]. It is necessary to emphasize that actions started by Probio are of mid to long term, where ***institutional continuity would be assured*** by the will stated by the steering committee in order to maintain the biomass subject into the involved institutions and by the fact that the new energy Director will be the DNE focal point in Probio.

The main risks for the sustainability of project results are related with global market issues, particularly the low oil prices that could leave renewable energies in a low competitive situation. For the case of biomass, power generation is assured at plants that are vertically integrated with the timber chain (forest-wood transformation), which will have to continue with the use of remains from the main activity (black liqueur from cellulose plants, wastes from wood transformation). The risk will be mainly focused on access for new actors that do not own the fuel.

Another risk for the biomass in Uruguay is the massive introduction of natural gas for electricity generation.

3.3.7. Impact

Though the program is just finishing and considering that the prodoc does not mention specific expected impacts (only CO2 phase-out), it is hard to foresee its future impacts.

However, it can be asserted that one of major impacts will be in the ownership mechanism generated by the project in order to ensure loyalty from participant institutions: hiring of professionals for the involved entities and organization of activities in line with institutional priorities, mainstreaming of useful products for these institutions, participatory management, etc. This type of management -widely shared by Uruguay Government- will be the foundation for implementation of the new GEF funded project called "Biovalor", since personnel trained and linked to Probio, will be maintained in the institutions that will execute this new project.

Secondly, the program promoted and developed room for technical, economic and policy discussions about the real biomass potential for energy use; and it is hoped the country is discussing the potential of development and use of wood plantations for energy uses in a short term, together with the development of the specific market niches identified by Probio. In this regard, the project main impact was of providing technical inputs about the situation of forestry biomass with regard of availability and operational costs, demonstrating what erroneous were the perceptions about this wood resource when the project was elaborated, thus, providing a "common ground" to all actors for their decision making process.

Lastly, investments for nearly 60 MW of installed power are expected to be effective when UTE allocates the tenders presented in the new call for bidding, which improved the access conditions for biomass power generators. These investments will reduce larger CO2 emissions than envisaged in the prodoc for the 5 MW pilot plant.

[23] See "Declaración en virtud del cierre operativo del PROYECTO DE PRODUCCIÓN DE ELECTRICIDAD A PARTIR DE BIOMASA, URU/10/G31, PROBIO y en el marco de su última reunión del Comité de Dirección"

4. Project Ratings

Table N°15 shows the project final ratings, according GEF requirements.

Table N°15: Final project ratings.

Rating Project Performance			
1. monitoring and Evaluation:	***Rating***	**2. IA & EA Execution**	***Rating***
Monitoring and Evaluation (initial design)	S	Implementing Agency Execution	S
Monitoring and Evaluation (implementation)	S	Executing Agency Execution	S
Overall quality of M&E	S	Overall Quality of Project Implementation/Execution	S
3. Outcomes	**Rating**	**4. Sustainability**	**Rating**
Relevance	R	Financial resources	L
Effectiveness	HS	Socio-economic	L
Efficiency	S	Institutional framework and governance	L
Overall Quality of Project Outcomes	S	Environmental	L
		Overall likelihood of risks to Sustainability:	ML

5. Conclusions, recommendations and lessons learnt

5.1 General Conclusions

The most weak part of the project was its design, since it was demonstrated later that some of its basic assumptions (based on available information when project was elaborated), were wrong (free availability at almost zero cost for the waste, etc.). However, the ***good project adaptative management*** could update the program and align it with the country real situation.

Indicators and results stated in the project design, appeared to be for products rather than results inidcators.

The long time elapsed between the project elaboration and its beginning (almost 6 years), played against it, since the country reality moved strongly forward during such period, leaving obsolete some program results, even if its objectives and main results were still valid.

Changes made to some project indicators and objectives for some specific components also had problems. In first place, it is not recommended to change indicators nor objectives, but it is better to explain the reasons by which indicators are not suitable and possible causes by which some results cannot be obtained.

Adjusting objectives for some specific results is not advisable, noting that were already reached when project started. It has no sense from the point of view of the evaluator.

Probio reached its development objective of creating proper scenarios that enable biomass power generators, be connected to the national electricity grid.

The environmental goal of avoiding CO2 emissions as direct result from project implementation; was not reached within its schedule, but it is very probable it will be attained once the UTE's bidding for electricity purchase is finished.

Results 1,2,3 and 5 have been satisfactory achieved. Result 4 could be questionable from the point of view of stating that it was reached before project started. However, there is a high chance that Probio had directly generated 60 MW of installed capacity once UTE biding is finished.

Probio is and has been relevant to country, since it is in the energy policy of Uruguay and it is perfectly integrated with other local economic development areas and institutional strengthening for entities such as DINAMA, DGF and DNE.

The program management system, consisting of a horizontal and participatory approach with associated institutions and hiring project personnel working at these institutions; achieved a high impact by identifying institutional priorities and align them with project objectives.

The program succeeded in incorporating the biomass subject in the agenda of local development organizations; and support for including biomass into its local development strategies.

The project steering committee met on regular basis and with the highest level of authorities from each participant institution; and its discussions incorporated the country strategic issues into Probio.

Adaptative management and project monitoring were suitable and in line with GEF guidelines.

Sustainability of results and good practices from Probio are ensured with the implementation of the new GEF project called "BioValor" and by the will of national directors stated at the last steering committee meeting, regarding with provide continuity to most of employees from each associated entity trained by Probio. In the same way, the new Directors of energy and DGF will contribute to continuity of what was made by the project.

However, some ***threatens to sustainability*** are related with issues beyond government control (low oil prices) and the massive incorporation of natural gas as energy source. These threats mostly focus on new actors entering the market, rather than to existing ones that are integrated to the value chain of forestry biomass.

5.2. Corrective measures for design, implementation and project monitoring and evaluation

For project design it is advisable to elaborate indicators for results. A document, a policy, etc., are not results, but actors making use of these products, that is a result.

An optimization for the number of indicators is suggested, leaving only those related with key aspects of a program.

For coming experiences of substantive revisions, it would be recommendable to leave indicators and project results as written in the original prodoc, since this allows evaluators to have a clearer

view of what was attempted to achieve and problems related to each project component. It is better to explain if the indicator or result is not appropriate and provide contextual information that enable the evaluator to balance all involved factors.

It is suggested not include in the logic framework; statements for objectives already achieved before project starts, since these are not owned by the incumbent project.

5.3. Actions to follow up or reinforce initial benefits from project

The participative and respectful management towards existent institutions is seen as positive for the achievement of project results. It is suggested to continue along this line with the activities that will follow Probio.

A good approach to local authorities and organizations would have a good impact on biomass project ownership by neighbor communities.

I would be convenient that DINAMA would exercise an active role in enforcement, elaboration of specific regulations and solutions for some environmental problems from biomass technologies, such as fuel storage conditions, for particulate matter and gaseous emission controls and ash disposal.

5.4. Lessons learnt

Project indicators should not be changed for fitting to a present situation, but an explanation of reasons by which a result could not be reached should be done instead. Neither assign a result as accomplished before project started, since indicators are a direct measure of the expected activities of the project. Changing indicators and results produce confusion for the evaluator and makes the result analysis more difficult.

The participative management with the associated institutions and the hiring of project personnel working inside of these entities showed very good results, thanks to the availability of useful information for the project. On the other hand, these personnel had the ability to detect the institutional needs and priorities and align them with those from the project. This situation created loyalty with project activities and provided sustainability.

The situation of forestry wastes in Uruguay indicates that the use of this type of biomass as fuel; is mainly related to the certainty on the availability of this fuel, thus being a niche activity, this is, its development is ensured by companies that present vertical integration (they are owners of the forest and transformation industry).

The viability of forestry biomass use as fuel depends to a large extension from operational costs involved in transport and biomass treatment before being used as a fuel.

The use of biomass as fuel entails emissions of air pollutants that should be controlled by abatement technologies. Ash production is an environmental to put attention on, since there is no experience in the country nor technology available for either, making an alternative use or safety disposal procedure.

Drying of biomass and its storage at open air also generates environmental issues, due to percolated liquid production that contaminates ground, thus authorities should also pay attention to this matter.

Annexes

Annex 1: ToR

Annex 2: Agenda

Date	Time	Location	Name	Position
17-12-2014	11:00 hrs	Por Skype	Jorge Rucks	Director Nacional de MA
Miércoles 03/12/2014	9: 30 hrs	PNUD, Barrios Amorín 870	Magdalena Preve, Alfonso Blanco, Pablo Montes, Staff PROBIO	Reunión apertura (equipo Probio, PNUD y punto Focal GEF)
	11:00 hrs	PNUD, Barrios Amorín 870	Aldo García	Representante Residente
	11:30 am	PNUD, Barrios Amorín 870	Veronica Monsuarez, Annabella Italiano	Encargada Adquisiones Pnud, Contable Probio
	12:00 hs	PNUD, Barrios Amorín 870	Magdalena Preve	Oficial de Programa
	13:30 hs	Dinama, piso 3 (Galicia 1133)	Equipo Probio.	
Jueves 04/12/2014	10:30 hs	DNE (Mercedes 1041 esq. Río Negro)	Wilson Sierra, Olga Otegui	Jefe Departamento ER -DNE
	11:30 hs	DNE (Mercedes 1041 esq. Río Negro)	Ramón Méndez	Director de Energía
	14:00 hs	DINAMA 3er piso	Magdalena Hill	Calidad Ambiental - DINAMA
	14:30 hs	DINAMA 3er piso	Mariana Kazprzyk	Cambio Climático - DINAMA
	15:30 HS	DINAMA 3er piso	Javiera y Silvia Aguinaga	Control Ambiental - DINAMA

Date	Time	Location	Name	Position
	16:00 hs	DINAMA 3er piso	Lucía	Impacto Ambiental DINAMA
Viernes 05/12/2014	10:00 hs	José Iturriaga 3589, entre L.A. de Herrera y Plaza Armenia	Juan Martínez	Weyerhaeuser
	14:00 hs	Dirección Forestal (Cerrito 318, piso 1)	Pedro Soust	Director Forestal
	16:00 hs	UTE	Ruben Chaer	Asesor Directorio UTE
Lunes 08/12/2014	9:00 hs	Dinama	Carrión	Conglomerado Madera Tcbó -Rivera
	9.00hs	Dinama - por SKIPE	Miguel Oñate	Conglomerado Madera Tcbó -Rivera
	10:30 hs	Sociedad de Productores Forestales (Edificio Ciudadela, Juncal 1327 D, oficina 304)	Atilio Ligrone	Reunión Sector Forestal, CSFM
	14:00 hs	Dinama 3er piso	Reunión de cierre, equipo probio	
Martes 09/12/2014		Libre		

Annex 3: List of interviews

N°	Name	Surname	Position	Institution	Phone	email
1	Magdalena	Hill	Jefa Depto Seguimiento	DINAMA	598-29170710	magdalenahill@mvotma.gub.uy
2	Silvia	Aguinaga	Control y Desempeño Ambiental	DINAMA	598-29170710	saguinaga@gmail.com
3	Lucia	Castillo	Técnico Div. Eval. Impacto Ambiental	DINAMA	598-29170710	lucia.castillo@mvotma.gub.uy
4	Pablo	Montes	Coordinador de la Cartera Nac. De Proyectos Ambientales (PFO del GEF)	DINAMA	598-99338980	pablo.montes@mvotma.gub.uy
5	Alfonso	Blanco	Coordinador Probio	DINAMA	598-97968954	alfonso.blanco0112@gmail.com
6	Mauro	Melani	Especialista en Energía Probio	DINAMA	598-99100525	mmelani@probio.gub.uy
7	Natalia	Zaldía	Especialista Ambiental Probio	DINAMA	598-99524259	nzaldia@probio.gub.uy
8	Luis	Sancho	Especialista Forestal Probio	DINAMA	598-99681419	lsancho@probio.gub.uy
9	Annabella	Italiano	Secretaria Probio	DINAMA	598-99997986	aitaliano@probio.gub.uy
10	Jorge	Rucks	Director Nacional de Medio Ambiente	DINAMA	598-29170710	
11	Pedro	Soust	Director General	Dir. General Forestal	598-29167756	psoust@mgap.gub.uy
12	Olga	Otegui	Área Energías Renovables	DNE	598-29006919	olga.otegui@dne.miem.gub.uy
13	Wilson	Sierra	Director Área Energías Renovables	DNE	598-29006919	wilson.sierra@dne.miem.gub.uy
14	Roberto	Scoz	Dir. Programa Nac. Forestal	INIA-Tacuarembó	598-46322407	rscoz@inia.org.uy
15	Ramón	Méndez	Director Nacional de Energía	Min. Industria, Energía y Minería	598-29012782	director@dne.miem.gub.uy
16	Magdalena	Preve	Prof. Asoc. Al Área de Medio Ambiente	PNUD Uruguay	598-98220791	magdalena.preve@undp.org
20	Veronica	Monsuarez	Encargada Finanzas	PNUD Uruguay		
19	Oliver	Page	Regional technical Advisor	PNUD-Panamá		oliver.page@undp.org
20	Atilio	Ligrone	Gerente	Soc. Productores Forestales del Uruguay	598-29146220	atilio.ligrone@spf.com.uy
21	Juan	Martínez Galán	Project and New Business Manager	Weyerhaeuser Productos S.A.	598-26234470	juan.martinez@weyerhaeuser.com

N°	Name	Surname	Position	Institution	Phone	email
22	Manuel	Oñate	Director	Conglomerado de la madera Tuacarembo-Rivera		
23	Rubén	Chaer	Asesor de Presidencia y Gerente de ADME. (Administradora del mercado mayorista de EE)	UTE		
	Mariana	Kazprzyk	Profesional Área Cambio Climático	DINAMA		

Annex 4: Summary of field visits

Time	Date	Subject	Activity summary
9:30 - 12:00	**3-12-2014**	Presentation on key aspects from project, evaluation methodology and emphasis for the different analysis category.	Inceotion meeting with UNDP country office, PFO and DINAMA representatives and Probio coordinator, and interview with UNDP resident representative. There was a meeting with UNDP financing official.
13:30 – 17:00		Meetings with project team. Each activity made by the project, budgets, administration system were presented.	Meetings made at DINAMA.
10:30 - 12:00	**4-12-2015**	Methodology used for project elaboration, type of information used, activities and results from project, sustainability, integration of project into DNE.	Meetings made at DNE
14:00 – 16:00		Training for different DINAMA officials, process for elaborating the prodoc, institutional participation in Probio activities and integration with the project, adaptative management, sustainability, main environmental issues from biomass use for power generation.	Meetings at DINAMA, with different oficials in charge of enforcement, environmental impact assessment, elaboration of environmental standards and climate change.
10:00-12:00	**5-12-2014**	Private sector participation during project elaboration and information available in that period, main project activities and results, sustainability, economic and technical issues for biomass power plants, project impacts on private sector.	Meetings at private Company headquarters (biomass power generator).
14:00-16:00		Project integration into bidding documents for energy purchase by UTE; project integration into institutions, activities made, results obtained, sustainability, challenges. Usefulness of project for partner institutions, available information during project elaboration and participation. Sector views ex-ante and after project implementation.	Meetings made at UTE y DGF, for analyzing strategic issues from project implementation.

Time	Date	Subject	Activity summary
9:00-12:00	**8-12-2014**	Sectoral view before and after project implementation, participation in project activities, available information during project design, usefulness of project information for decisión making, sustainability, main technical and economic issues for biomass use as fuel, energy crops.	Meetings with key actors from forestry sector (business associations and local development organizations). Talking by skype and at actors' headquarters.
15:00-16:00		Meeting for discussing progress and milestones of INIA's study, sectoral view before and after project implementation, sustainability, main preliminary results and prospects.	Meeting at DINAMA with director of INIA Tacuarembó.
10:00-12:00	**9-12-2015**	Presentation and discussion of main preliminary findings from project evaluation.	At DINAMA.

Annex 5: Document list

Document	Document
08y30hs. Ram¢n M,ndez.pdf	nama_recognition_uruguay_renewable_energy.pdf
N§ 151.004 del 5.5.04.pdf	Evaluaci¢n_EE_BM_uy.pdf
2013_Actualizacin_Informe_Disponibilidad.pdf	N§ 299-008 del 20.06.08 - Aplicaci¢n del art¡culo 2§ numeral III) del Decreto 397-007.pdf
2013_Actualizacin_Informe_Disponibilidad_probio.pdf	N§ 367-010 del 10.12.10 - Incorporaci¢n de potencia de generaci¢n el,ctrica al sistema nacional.pdf
3-BALANCE ENERG□TICO 2011.pdf	N§ 377-009 del 14.08.09 - Contratos de compraventa de energ¡a el,ctrica.pdf
4. 2013 05 05 Infor VM_biomasa en chile.pdf	Planificacion-Energia-Caso Uruguay.pdf
Adriana_Torchelo_CC_ERNC.pdf	pmegema_doc_2004.pdf
agenda forestal 2013_biomasa.pdf	Pol¡tica energ,tica 2005-2030.pdf
Analisis de rentabilidad-biomasa peque¤a escala-Uruguay.pdf	presentacin1-120807113158-phpapp01.ppt
biocombustibles-nov-2014.pdf	PRESENTACION_FERREIRA_recursos_compartidos.pdf
Bioenergy International Espa¤a_probio.pdf	Presentaci¢n_Biomasa_Cabrera_camara-uru-aleman.pdf
briefing-nuevas-tendencias-AL2014_monocultivo.pdf	Programa_BID_DINAMA_uy.pdf
BRSCGI_CIER.pdf	Proyecto GEF_UNIDO.pdf
cdip_11_inf_2FAO.pdf	Proyecto_Ciclo_Combinado_Punta_del_Tigre_B_BID.pdf
cl_marianakasprzyck_PGDEMA.pdf	Ramon Mendez_pol¡tica_energ,tica_uruguay.pdf
cl_marianakasprzyck_PGDEMA_2008.pdf	Regulaciones_el,ctricas en uruguay-escrito pot UTE.docx
Decreto_389-005.pdf	Renewable-energy-Apr-2013-Uruguay-XXI.pdf
decreto_renovables60MW.pdf	residuos biomasa_uruguay.xls
dirlist.txt	Revisi¢n Sustantiva.pdf
energ¡a e¢lica en uruguay_2014.pdf	Sector Energ,tico uruguayo.rtf
Estrategias y mecanismos financieros para bosques_IUCN_2006.pdf	TCN2+URSEA+Energia+Electrica+2014+05.pdf
estudio_FAO_biomasa.pdf	TdeR coordinador Proyecto GEF-Economia verde final.pdf
Marcelo-Guadalupe_tacuaremb¢.ppt	Evaluaci¢n de la disponibilidad de residuos o subproductos_faloppa_2010.pdf
FAO_uruguay_biomasa.pdf	Forestacion_junio2003_uruguay_FAO.pdf
FinalWorkshopColombia_Uruguay_biomasa.pdf	forestal oyhantcabal_2003_residuos_forestales.pdf
forestacinconchillas-1227020787293392-9.ppt	GEF-4_Focal Area Strategies.pdf
Forestacion en Uruguay-2011_POU.pdf	Informe-de-energ¡as-renovables-Abr-20131.pdf
Informe-Medio-Ambiente-y-Energ¡a-en-Uruguay.pdf	Informe-de-energ¡as-renovables-Agosto-2014.pdf
Informe-Rivera-Uruguay-XXI.pdf	Informe_Encuesta_Industria 2013.pdf

INFORME_A_PRESIDENCIA_ONUDI_2002.pdf	Informe_Encuesta_Le¤a_2012_uruguay.pdf
URSEA_2014_apr.pdf	libro_biomasa_chile.pdf
URU10G31 - BIOMASA_prodoc.pdf	2014.05.30_Act_1.1.3_CensoForestoIndustria_Interconsult_final.pdf
UruguayESP_borrador_UN_2010.pdf	2014.06.15_Act_1.1.5_InformeAvanceIII_ConvenioINIA_Dinama_final.pdf
2011.12.06_Informe_Actividad_1.1.4_Actores.pdf	2014.06.15_Act_1.1.5_InformeAvanceII_ConvenioINIA_Dinama_final.pdf
2011.12.15_Informe_Actividad_1.1.1_EvaluacionSIF.pdf	2014.06.15_Act_1.4.2b_RelevAn lisis MRV_NAMAs_InfoFinal_ ParteI_ATorchelo.pdf
2012.08.15_Actividad_1.1.2a_Informe_DispBiomasa_Forestal.pdf	2014.06.15_Act_1.4.2b_RelevAn lisis MRV_NAMAs_PPTInfoFinal_ATorchelo.pdf
2013.06.05_Informe_Act_1.1.2_Actualizacion_DispBiomasa_RegionCNNE.pdf	2014.08.15_Act_1.4.1_PlanesMonitoreoCalidadAire_ENettoINFORME_I.pdf
2013.12.26_Actividad_1.1.2b_Informe_DispBiomasa_Arroz_V3.pdf	2014.08.15_Act_1.4.1_PlanesMonitoreoCalidadAire_ENettoINFORME_III.pdf
2012.08.21Act_1.2.1a_Actualizaci¢nCartograf¡aForestal_2012_AeroTerra.pdf	2014.08.15_Act_1.4.1_PlanesMonitoreoCalidadAire_ENettoINFORME_II_interno.pdf
2013.03.17_Act_1.2.1a_Infocomplemetario_Actualizaci¢nCartografiaForestal_2012_AeroTerra.pdf	2014.10.01_Act_1.4.3_Intercambioproyectosamb.Gesti¢nResiduos.pdf
2014.06.01_Act_1.2.1b_InvNacBiomasa_INBIO_Ingesur.pdf	2011.12.30_Act.2.1.4_Reuniones_calderas.pdf
2012.05.10_Act_1.3.1_AnalisisUsosPotenciales_Resumenentrevistas_final.pdf	2012.01.16_Informe_Act_2.1.4_Tecnologi¡as.pdf
2014.03.17_Act_1.4.2a_Metodologi¡aemisiones_Versi¢ninterna_ENetto.pdf	2012.09.06_Informe_Act_2 1 6_Interconexion.pdf
2014.03.17_Act_1.4.2a_Metodologi¡aemisiones_VersWeb_ENetto.pdf	2013.06.30_Act_2.1.9_EstadodelArte(Sintesis)_Casado.pdf
2014.06.15_Act_1.4.2b_RelevAn lisis MRV_NAMAs_InfoFinal_ ParteII_ATorchelo.pdf	2013.06.30_Act_2.1.9_EstadodelArte_Casado.pdf
2013.07.31_Informe_Act_2.1.7_Evaluaci¢nfinancieraproyectos.pdf	2013.07.01_Informe_Act_2.1.3_Impactoecon¢mico.pdf
2014.02.28_Informe_Act_2.1.8_BalanceEnergia.pdf	2013.07.14_Actividad_2.1.2_Informe_CadenaCostos_CapII.pdf
2014.11.10_Act._2.1.3b_TrabajoBecarioFulbright_AnalisisExternalidadesAmbientales_JMahady.pdf	2013.07.31_Informe_Act_2.1.5_Cogeneraci¢n.pdf
2012.10.15_Act_2.2.1b_Informeevaluaci¢ndecreto367.pdf	Informe_Actividad_2 4 1_Gu◦a_Control y Mitigaci┌n_Emisiones_V2.pdf
2013.09.30_Act_2.2.1a_Beneficios_IncorporacionBiomasaFinal.pdf	2014.01.02_Act_3.1.3_InstrucCertificacionComponenteNacional_CIU.pdf
2013.12.30_Act_2.2.1c_Modelado SimSEE Expansi¢nProbio-	2014.11.25_Informe_Act_3.1.1_Capacidades locales.pdf

Parte2.pdf	
2014.02.09_Act._2.2.1_TrabajoBecarioFulbright_ComparativoPoli¦tInternacionalBiomasa_JMahady.pdf	2014.11.25_Informe_Act_3.1.3_InstanciasInformacion.pdf
Act_2.2.1_Acciones_nivel_poli¦tica_para incorporaci¢n biomasa	Act_3.2.1_3.2.2_P gina_Web_Logo
Act_2.2.1_ResolucionesOficiales	Act_3.2.4_Articulosprensa_otros
Act_2_2_1_DataRooms	Act_3.2.5_InformeTallerPROBIO_3nov2011
Acta_ReunionUTE_cadena_de_valor_2013.02.22 (1).pdf	Act_3.2.6_CapacitacionesIntegrantesEquipo
Act_2.2.1_II_EncuentroInternacDerechoAmbForestal_7nov2012Piriapolis.doc	Act_3.2.6_Capacitacion_Emisiones_ENetto
Act_2.2.1_XIV_ReunionMMA_Mercosur	Act_3.2.6_CharlasDNE
PresentDNE_2012.10.15_EvaluacionDec367.pdf	Act_3.2.6_InformeExpobioenergia2012
PresentDNE_2013.06.06_Situaci¢n_y_perspectivas de Biomasa.pdf	Act_3.2.6_Jornada_18.12.13_CasadoHernandez
PresentDNE_2013.07.22_Situaci¢n_perspectivas_Biomasa.pdf	Act_3.2.6_MisionBolivia
PresentDNE_2013.08.22_1-BeneficiosincorporacionBiomasa.pdf	Act_3.2.6_TallerUNIT_14oct2013
PresentDNE_2013.08.22_2-Generaci¢n de empleo directo e indirecto.pdf	Act_3.3.1_Tallerbiomasa_16abril2013
PresentDNE_2013.08.22_3-Borrador decreto.pdf	2013.06.25_Actividad_4.1.1_Planta_Piloto.pdf
PresentDNE_2013.12.06_Preciosindiferencia.pptx	Act_5.1.2_MonitoreoPrograma_InformesPNUD
PresentUTE_2013.02.28_Cadena de Valor.pdf	Act_5.1.2_MonitoreoPrograma_ReunionesComDireccion
22 10 14 Borrador_decreto_biomasa.pdf	URUG1031-PROBIO-InformeAnual2011.pdf
R12.-1851 22NOV12.pdf	URUG1031-PROBIO-InformeAnual2012_version 2.pdf
1er DataRoom_Generaci┌napartirBiomasa_10-10-2013 (1).pdf	URUG1031-PROBIO-InformeAnual2013_V15marzo.pdf
2do DataRoom_Generaci┌napartirBiomasa_20-06-2014.pdf	1_CDir_mayo2011
3er DataRoom_Generaci┌napartirBiomasa_14-10-2014.pdf	2_CDir_jun2011
2014.05.02_Act_2.3.1_PlanesDesarrollo.pdf	3_CDir_abril2012
2014.03.31_Act_2.4.2_Informe_EstandaresSeguridad.pdf	4_CDir_dic2012
Act_2.4.1_GESTA_Emisiones gaseosas fuentes fijas.pdf	5_CDir_oct2013
	6_CDir_marzo2014

Annex 6: Evaluation questions matrix

Criterio de Evaluación	Preguntas	Indicadores	fuentes
Relevancia **La medida en la que una actividad se adapta a las prioridades de desarrollo local y nacional y a las políticas organizativas, incluidos los cambios a lo largo del tiempo. La medida en la que el proyecto está de acuerdo con los programas operativos del FMAM o con las prioridades estratégicas sobre las que se financió el proyecto. Nota: En retrospectiva, la cuestión de la relevancia a menudo se convierte en una pregunta sobre si los objetivos de una intervención o su diseño son aún adecuados dados los cambios en las circunstancias.**	El proyecto forma parte de las prioridades de DINAMA, la DGF, DNE y organizaciones de actores interesados?	Proyecto y actividades en reportes institucionales anuales	PP PNUD; Prodoc; Reportes anuales presidencia de Uruguay.
	Está incluido en el PP de PNUD y UNDAF?	Proyecto dentro de actividades PP y UNDAF	PP PNUD; Prodoc;UNDAF
	Está dentro de las prioridades y programas operativos del FMAM?	Proyecto responde a líneas programáticas y PO del FMAM	Prodoc, programas operativos FMAM.
	Está dentro de las actividades de DINAMA, DGF, DNETN y UTE?	Actividades proyecto dentro de procedimientos, programación y políticas UTE.	Documentos política UTE, Prodoc, procedimientos UTE
	El diseño del proyecto consideró la consulta a todos los actores e información relevantes?	N° de actores consultados; N° fuentes información y estudios realizados durante la preparación del proyecto.	Prodoc, entrevistas, PDF-A, estudios técnicos.
	Está dentro de los compromisos de Uruguay con el Protocolo de Kioto y la UNFCC?	Actividades responden a compromisos de reducción de emisiones de CO2?	Kioto, UNFCCC, Prodoc.
Efectividad: **La medida en la que se alcanzó un objetivo o la probabilidad de que se logre.**	Se logró la eliminación de CO2 de acuerdo al proyecto?	N° de Plantas generadoras, Cantidad de MW producidos con biomasa, evolución del % de generación energía con biomasa y tasa sustitución combustibles fósiles.	N° concursos llamado por el gobierno, contratos generadoras con UTE.
	El proyecto logró transformar el mercado de generación de electricidad a partir de la biomasa?	N° barreras eliminadas por el proyecto; N° de modelos de negocio desarrollados.	N° de modelos de negocio desarrollados; N° de normativa sectorial aportada por el proyecto; insumos para regulaciones proveniente del proyecto (principalmente estudios)
	Se logró mejorar la calidad y cantidad de información referente a los recursos de biomasa existentes?	Base de datos; cartografía SIG, N° de proyectos de generación utilizando la información para sus negocios.	N° usuarios que utilizan la información, documentación técnica y sistema geográfico
	Se logró determinar las ventajas y desventajas ambientales/sociales/sostenibilidad del uso de residuos forestales como generador de electricidad?	Evaluación Ambiental Estratégica del Sector	Documento de EAE, insumos del proyecto entregados para facilitar la EAE.
	Se logró involucrar a las autoridades locales en el proyecto a través del plan de desarrollo de la biomasa?.	Plan de desarrollo de la biomasa.	Minutas reuniones con autoridades locales, planes locales de desarrollo de energía que utilizan los insumos del proyecto, consultorías elaboración plan.

Criterio de Evaluación	Preguntas	Indicadores	fuentes
	Se ha logrado promover entre las empresas, los inversionistas y público en general, las oportunidades de negocio para generación de electricidad a partir de la biomasa?	Aumento de apoyo técnico a la CIU; N° coordinaciones entre sector público-universidades y privados.	Minutas reuniones, documentación del proyecto, informes de talleres realizados, campañas de prensa, pág. Web.
	Se pudo realizar la planta piloto y demostrar la viabilidad y modelo del negocio?	Planta funcionando y conectada a la red; estudios de funcionamiento realizados, medición de parámetros y modelo de negocio desarrollado.	Planos Diseño planta, estudios realizados, minutas reuniones, plan de negocio.
	Se logró fortalecer el marco de políticas para la generación de electricidad a partir de residuos forestales y agrícolas?	N° de políticas sectoriales elaboradas con insumos técnico-económicos provenientes del proyecto; estrategia para producción de energía de residuos de biomasa forestal; plan de desarrollo de la biomasa, estándares de emisión y mecanismos de consulta partes interesadas; revisión marco político forestación.	Minutas reuniones con DNETN, UTE, DINAMA, documentos técnicos elaborados por el proyecto, normativa generada.
Eficiencia: **¿El proyecto se implementó de manera eficiente en conformidad con las normas y los estándares internacionales y nacionales?**	Se realizaron los reportes anuales?	N° de reportes realizados (PIR, POA, APR)	Reportes de progreso, PIR, APR
	Se realizó una programación anual de actividades?	N° POAs elaborados	Programas Operativos anuales.
	Los productos y/o servicios del proyecto se lograron al menor costo posible?.	N° cotizaciones presentadas en procesos de licitación	Documentos de licitación, reportes proyecto.
	Se realizaron procesos de licitación y elaboración de TdR de acuerdo a los estándares PNUD y FMAM.	N° licitaciones realizadas de acuerdo a normas PNUD y FMAM	Reportes de progreso, PIR, APR, llamados a licitación PNUD
	Se realizaron actividades de SyE y se reportaron los resultados?	Reportes evaluación medio término, programas y reportes anuales, reuniones comité coordinación y técnico.	Reporte Evaluación Medio Término; reportes y programaciones anuales proyecto, APR, PIR, actas comité coordinación proyecto, actas comités técnicos.
Resultados: **Los cambios positivos y negativos, previstos e imprevistos y los efectos producidos por una intervención de desarrollo.** **En términos del FMAM, los resultados incluyen el rendimiento directo del proyecto, de corto a mediano plazo, y el impacto a mayor plazo que incluye beneficios del medio ambiente mundial, efectos de repetición y otros efectos locales.**	El país cuenta ahora con mejores capacidades institucionales para gestionar proyectos de generación eléctrica a partir de los residuos forestales?	N° funcionarios relacionados para analizar técnica y ambientalmente proyectos de biomasa en DINAMA, DNETN, DGF y UTE; cantidad de recursos para estudios del tema; N° de funcionarios y empresas capacitados.	Contratos personal proyecto en sector público involucrado (DINAMA, DNETN, DGF, UTE), presupuestos institucionales para realizar actividades relacionadas con el tema; presupuestos empresas para actividades biomasa.
	Se contribuyó a disminuir la emisión global de CO2?	Ton CO2 evitadas	Prodoc, evaluaciones técnicas, informes, entrevistas.
	Se logró disminuir los problemas asociados con la acumulación de	Ton residuos forestales que ya no son quemados o dispuestos.	Prodoc, evaluaciones técnicas, informes, entrevistas.

Criterio de Evaluación	Preguntas	Indicadores	fuentes
	residuos en el país?		
	Se logró que la industria nacional se beneficiara como proveedor de servicios y tecnología para las industrias productoras de electricidad de residuos forestales?.	N° puestos de trabajo nuevos gracias a inversiones en generadores de energía a partir de la biomasa; cantidad de empresas proveedoras de generadoras.	Entrevistas, estudios técnicos, prodoc.
	Existe posibilidad de repetición del proyecto a escala local, nacional y/o regional?	N° de reuniones internacionales donde participaron integrantes equipo proyecto, N° publicaciones resultados proyecto; Taller cierre proyecto; N° proyectos generación locales.	Talleres internacionales, publicaciones proyecto, informe taller final, PIR
Sostenibilidad: **La capacidad probable de que una intervención continúe brindando beneficios durante un período después de su finalización. El proyecto debe ser sostenible tanto ambientalmente, como financiera y socialmente.**	Se logró instalar la temática y acciones respecto de la generación de electricidad a partir de residuos forestales entre los actores claves (DNE, DINAMA, DGF, etc)	N° funcionarios relacionados con el tema biomasa en DINAMA, DNE, DGF; presupuestos para continuar tema institucionalmente, N° proyectos nuevos generación.	Localización equipo de proyecto en DINAMA, DNE, DGF y UTE, localización profesionales utilizando información generada por Probio en DINAMA, DNE y UTE, prioridades DINAMA
	Las instituciones públicas podrán evaluar ambiental y económicamente proyectos de biomasa?	N° funcionarios públicos capacitados, N° profesionales Probio contratados en el estado.	Contratos, minutas de reuniones, PIR.
	Las instituciones públicas tendrán personal capacitado para controlar el correcto funcionamiento de las plantas en el futuro?	N° fiscalizadores capacitados en DINAMA y otros organismos sectoriales.	Informes de talleres realizados, asistencia, material de difusión.
	El sector público podrá seguir promoviendo y apoyando la generación de electricidad a partir de residuos forestales, una vez que el proyecto haya terminado?	N° Planes de difusión Biomasa en DINAMA, DNETN, DGF, cantidad de recursos asignados para esta actividad; N° de decretos incentivando generación a partir de biomasa.	Entrevistas, planificación instituciones, nueva normativa.

Annex 7: Itinerary for the evaluation

The evaluation report had three rounds of comments from interested parties. Comments can be categorized as follows: i) editorial revisions that improved text accuracy and ii) revisions involving changes in contents that the report was addressing, and therefore, affecting the analysis and conclusions of the report.

In total, 400 editorial revisions and 49 comments were obtained. In general speaking, there was no basic differences between the evaluator and reviewers, being most of comments improvements to the original text, most of them being accepted by the evaluator.

The following table shows details about each comment and changes made.

El Cuadro siguiente muestra el detalle de los comentarios y los cambios realizados.

Page	Comment's Scope	Comment's text	Author	Date
13	El logro ambiental de evitar emisiones de CO2 como consecuencia directa del proyecto, no se pudo alcanzar dentro del plazo de ejecución del mismo, pero es altamente probable que se logre una vez finalizada la licitación de compra de 60 MW energía de biomasa por parte de UTE.	Acá se indica que este logro no se alcanzó pero que es probable que se logre, Más adelante en la pág. 52 se pone lo siguiente: En primer lugar, el objetivo medioambiental global del proyecto era evitar las emisiones de CO2 provenientes de la generación de electricidad a partir de combustibles fósiles. Es objetivo se puede decir que se logró, gracias al apoyo del proyecto en la elaboración del decreto de licitación de UTE, donde se espera contratar alrededor de 60 MW de potencia instalada en base a biomasa, instalaciones que se materializarán después de finalizado el proyecto. Este resultado superaría largamente lo establecido en el prodoc sobre la instalación de una planta piloto de 5MW. Sugiero poner aquí en el Resumen Ejecutivo lo mismo que está escrito en la pag 52	magdalena.preve	30-ene-2015
13	El logro ambiental de evitar emisiones de CO2 como consecuencia directa del proyecto, no se pudo alcanzar dentro del plazo de ejecución del mismo, pero es altamente probable que se logre una vez finalizada la licitación de compra de 60 MW energía de biomasa por parte de UTE.	Se cambió ahora el pár. 52, porque tuve una equivocación en el par 52, puesto que las emisiones es probable que se logren después del proyecto.	Jorge Leiva Valenzuela	15-feb-2015
14		Ver comentario página 60, sección Eficiencia y Efectividad	magdalena.preve	02-feb-2015
14		Se va a corregir	Jorge Leiva Valenzuela	14-feb-2015
15		Si todos los aspectos de la sostenibilidad fueron calificados como P no debería ser también la calificación de sostenibilidad general P?	magdalena.preve	02-feb-2015
15		No creo que sea tan lineal, porque no están incluidos los factores externos, como la baja del petróleo y la entrada del gas natural a Uruguay, por eso puse AP, porque existen esas situaciones que pueden desalentar el uso de biomasa y otras fuentes renovables.	Jorge Leiva Valenzuela	12-feb-2015
17		Párrafo repetido	magdalena.preve	30-ene-2015
17		Ok, se saca	Jorge Leiva Valenzuela	12-feb-2015
18	montos	Habría que agregar los montos en la carátula	magdalena.preve	30-ene-2015
18	montos	Se va a arreglar	Jorge Leiva Valenzuela	15-feb-2015
42	El proyecto se elaboró con la información disponible al año 2005 y en algunos conceptos y apreciaciones	Me parece algo duro decir que detectamos que eran incorrectas. Nuestro aporte fue la identificación de cambios a nivel coyuntural y estructural que evidenciaron que algunos supuestos de l a formulación	Alfonso Blanco	17-feb-2015

Page	Comment's Scope	Comment's text	Author	Date
	que finalmente, debido a situaciones coyunturales y estructurales, no se cumplieron durante la ejecución del proyecto	no se cumplían.		
42	la cual finalmente es ratificado por un acuerdo multipartidarioen el año 2008	Incorrecto esto: La política energética se ratifica por un acuerdo multipartidario, no pasa este acuerdo por el congreso. En uruguay diría Parlamento y no Congreso.	Alfonso Blanco	17-feb-2015
42	la cual finalmente es ratificado por un acuerdo multipartidarioen el año 2008	arreglado	Jorge Leiva Valenzuela	07-abr-2015
51		A la fecha solamente quedan 2 pagos pendientes, el pago final de la evaluación y el pago final del INIA, que se realizan con fondos del proyecto de origen MVOTMA.	magdalena.preve	30-ene-2015
51	después	Es importante destacar acá que los fiondos que resta ejecutar son los de contraparte MVOTMA habiéndose ejecutado todos los fondos GEF a la fecha.	Alfonso Blanco	17-feb-2015
51	después	Ok, se agregó	Jorge Leiva Valenzuela	07-abr-2015
54	En primer lugar, el objetivo medioambiental global del proyecto era evitar las emisiones de CO2 provenientes de la generación de electricidad a partir de combustibles fósiles. Aunque este objetivo no se cumplió dentro del período de ejecución del proyecto, se puede afirmar que es altamente probable que se logre una vez finalizadas las actividades del proyecto, gracias al apoyo del proyecto en la elaboración del decreto de licitación de UTE, donde se espera contratar alrededor de 60 MW de potencia instalada en base a biomasa, cuyas instalaciones se materializarán después de finalizado el proyecto. Este resultado superaría largamente lo establecido en el prodoc sobre la instalación de una planta piloto de 5MW.	Ver comentario realizado en el Resumen Ejecutivo de citar este texto	magdalena.preve	30-ene-2015

Page	Comment's Scope	Comment's text	Author	Date
54	En primer lugar, el objetivo medioambiental global del proyecto era evitar las emisiones de CO2 provenientes de la generación de electricidad a partir de combustibles fósiles. Aunque este objetivo no se cumplió dentro del período de ejecución del proyecto, se puede afirmar que es altamente probable que se logre una vez finalizadas las actividades del proyecto, gracias al apoyo del proyecto en la elaboración del decreto de licitación de UTE, donde se espera contratar alrededor de 60 MW de potencia instalada en base a biomasa, cuyas instalaciones se materializarán después de finalizado el proyecto. Este resultado superaría largamente lo establecido en el prodoc sobre la instalación de una planta piloto de 5MW.	Se ajustó el texto.	Jorge Leiva Valenzuela	15-feb-2015
54		Encuentro algo duro esta terminología y creo que puede herir la sensibilidad de actores institucionales. Mi sugerencia es decir que existían desviaciones entre lo inicialmente supuesto y la sitiuación al incio de la ejecución del proyecto.	Alfonso Blanco	17-feb-2015
54		Arreglé el párrafo con uno más exacto (según mi parecer)	Jorge Leiva Valenzuela	07-abr-2015
56	AS	En los comentarios de la página anterior se indica como que este objetivo fue logrado pero acá se califica como Algo Satisfactorio.	magdalena.preve	30-ene-2015
56	AS	La verdad es que me equivoqué en la afirmación. Lo que pasa es que es alta la probabilidad de que se logre el objetivo después del proyecto, pero aún hay que realizar todo el proceso de licitación y recién ahí se va a ver si hay ofertas viables y después de eso va a haber que esperar que se construyan las plantas. Creo que está bien poner este ítem como AS	Jorge Leiva Valenzuela	14-feb-2015
56	S	En los comentarios de la página anterior se indica que el objetivo de desarrollo fue plenamente pero acá se califica como Algo Satisfactorio	magdalena.preve	30-ene-2015
56	S	Es S, lo voy a cambiar	Jorge Leiva Valenzuela	14-feb-2015
61	desarrollo	Coincido con el comentario de magdalena.	Alfonso Blanco	17-feb-2015

Page	Comment's Scope	Comment's text	Author	Date
61	desarrollo	Se arreglo	Jorge Leiva Valenzuela	07-abr-2015
61	El objetivo de desarrollo del proyecto, fue el de promover la integración a la red de suministro eléctrico nacional de generadores de energía basados en biomasa. Este objetivo se lograría a través del desarrollo e implementación de escenarios para la explotación sustentable de la biomasa forestal. En este aspecto, tal como se discutió en la Sección 3, Probio ha sido efectivo en la generación de información técnica y económica relevante que ha influido en la elaboración de decretos de licitación de compra de energía por parte de UTE, que han incluido los incentivos necesarios para permitir la entrada de nuevos actores en la generación de electricidad basada en biomasa forestal. Además, el programa fue muy efectivo en introducir el tema en el sector público (gracias a los profesionales ad-hoc contratados para DNE, DINAMA y DGF y a la gestión participativa con todos los actores), y también en el sector privado, gracias a la participación del programa con organizaciones empresariales privadas y organizaciones de desarrollo nacionales y locales	De estos comentarios se entiende que el proyecto fue efectivo pero se califica como Algo Satisfactorio	magdalena.preve	30-ene-2015
61	El objetivo de desarrollo del proyecto, fue el de promover la integración a la red de suministro eléctrico nacional de generadores de energía basados en biomasa. Este objetivo se lograría a	Si, es cierto, queda como muy satisfactorio, puesto que es lo que, a mi juicio, fue lo mejor logrado	Jorge Leiva Valenzuela	14-feb-2015

Page	Comment's Scope	Comment's text	Author	Date
	través del desarrollo e implementación de escenarios para la explotación sustentable de la biomasa forestal. En este aspecto, tal como se discutió en la Sección 3, Probio ha sido efectivo en la generación de información técnica y económica relevante que ha influido en la elaboración de decretos de licitación de compra de energía por parte de UTE, que han incluido los incentivos necesarios para permitir la entrada de nuevos actores en la generación de electricidad basada en biomasa forestal. Además, el programa fue muy efectivo en introducir el tema en el sector público (gracias a los profesionales ad-hoc contratados para DNE, DINAMA y DGF y a la gestión participativa con todos los actores), y también en el sector privado, gracias a la participación del programa con organizaciones empresariales privadas y organizaciones de desarrollo nacionales y locales			
62	Integración	PNU-Panamá: 4. En términos de género, si hubiera algún desglose relevante de los logros, podría añadirse, lo mismo para prevención de crisis y pobreza como áreas de trabajo transversales de PNUD.	Jorge Leiva Valenzuela	15-feb-2015
62	Integración	Se agregarán estos puntos. Con respecto al género, no hay datos específicos.	Jorge Leiva Valenzuela	15-feb-2015
62	energético	No hay resultados esperados en la formulación respecto a género. Lo que se puede destacar es la conformación del equipo de proyecto que a nivel técnico incluyó especialistas sectoriales en igual cuota de género.	Alfonso Blanco	17-feb-2015
62	energético	Ok, agregué párrafo.	Jorge Leiva Valenzuela	07-abr-2015
63	Además, el Comité Directivo del Probio declaró que gran parte de los	Agregaría que además todas las acciones iniciadas en el marco del PROBIO tienen un horizonte de largo plazo y continuidad asegurada en	magdalena.preve	30-ene-2015

Page	Comment's Scope	Comment's text	Author	Date
	recursos humanos desarrollados y capacitados por el Probio, permanecerán vinculados a las direcciones nacionales de las instituciones que participaron en el programa	el seno de las áreas específicas de las Direcciones involucradas, de acuerdo a lo también declarado por los Directores Nacionales en la última sesión del Comité de Dirección.		
63	Además, el Comité Directivo del Probio declaró que gran parte de los recursos humanos desarrollados y capacitados por el Probio, permanecerán vinculados a las direcciones nacionales de las instituciones que participaron en el programa	Se agrega párrafo, creo que es complementario a lo que se había escrito sobre este tema	Jorge Leiva Valenzuela	14-feb-2015
63	Cabe	Es importante también destacar que para la próxima administración el nuevo director de energía es el punto focal de la DNE en el PROBIO, eso también asegura continuidad ya que Olga Otegui es alguien altamente comprometida con la Biomasa.	Alfonso Blanco	17-feb-2015
63	Cabe	Se agregó párrafo.	Jorge Leiva Valenzuela	07-abr-2015
63	Impacto	PNUD-Panamá: 2. Impacto (punto 3.3.7): Sería bueno ahondar un poco más en los impactos generados, quizás un poco más de explicación? además separar o identificar cuáles eran los impactos que se pretendían al inicio del proyecto de los que no.	Jorge Leiva Valenzuela	14-feb-2015
63	Impacto	Se tratará de incorporar más detalladamente los impactos, pero hay que recordar que una medición de impacto se genera cuando pasa algún tiempo de finalizado el proyecto. Además el prodoc no habla de impactos esperados, a excepción de la eliminación de CO2 en un tiempo de 20 años.	Jorge Leiva Valenzuela	15-feb-2015
63	CO2	Puedo pasar los datos de generación para 2014 si fuera de interés, pero coincido con lo argumentado por Jorge.	Alfonso Blanco	17-feb-2015
63	CO2	ok	Jorge Leiva Valenzuela	07-abr-2015
64	proyecto	Comentario PNUD Panamá: 1. Ratings (punto 4.0): la tabla con los ratings del proyecto no muestra la justificación para cada rating, ni tampoco la justificación en general (o al menos no están claramente por insumo). Lo mismo en el cuadro de la página 13-14. Lo mejor sería agregarle una columna a las tablas y ponerles la justificación por cada campo de evaluación (eficiencia, relevancia, ejecución del M&E, recursos	Jorge Leiva Valenzuela	14-feb-2015

Page	Comment's Scope	Comment's text	Author	Date
		financieros, etc.)		
64	proyecto	Este cuadro es la síntesis de todo lo discutido en las secciones anteriores. Yo no le agregaría nada, debido a que es un formato estándar del GEF. Lo de las tablas de las pag 13-14, que supongo es el Cuadro N° 14. Este cuadro tiene un comentario explicativo, además de que también está basado en la discusión de las secciones anteriores. Yo tampoco le agregaría nada, ya que también es un formato GEF que aparece en el Anexo 5 de la guía PNUD-GEF	Jorge Leiva Valenzuela	14-feb-2015
64	Generales	PNUD-Panamá: 3. Conclusiones y lecciones aprendidas (punto 5.1): Puedo ver conclusiones y recomendaciones, más no lecciones aprendidas (o al menos no se distinguen). A lo largo del documento se habla de que hubo publicaciones y videos acerca de las lecciones aprendidas, pero no se enumeran en el documento, quizás poner las más relevantes? Lo mismo para buenas practicas con potencial de replicarse en otros proyectos.	Jorge Leiva Valenzuela	15-feb-2015
64	Generales	Se incluirá el acápite	Jorge Leiva Valenzuela	15-feb-2015
65	UTE	Lo resultados previstos de reducción de emisiones con la incorporación prevista se cumplirían. La verdad es que me quedo con probable, ya que todavía hay camino por recorrer para que esto se haga realidad.	Alfonso Blanco	17-feb-2015
65	El logro ambiental de evitar emisiones de CO2 como consecuencia directa del proyecto, no se pudo alcanzar dentro del plazo de ejecución del mismo, pero es probable que se logre una vez finalizada la licitación de compra de energía por parte de UTE.	Ver comentario anterior sobre este tema. Sugiero poner el texto de la página 52, lo mismo sugerido para el Resumen Ejecutivo	magdalena.preve	30-ene-2015
65	El logro ambiental de evitar emisiones de CO2 como consecuencia directa del proyecto, no se pudo alcanzar dentro del plazo de ejecución del mismo, pero es probable que se logre una vez finalizada la licitación de compra de energía por parte de UTE.		Jorge Leiva Valenzuela	14-feb-2015
65	La sostenibilidad de los resultados y buenas prácticas del Probio, están	Agregaría Que todas las acciones iniciadas en el marco del PROBIO tienen un horizonte de largo plazo y continuidad asegurada en el seno	magdalena.preve	30-ene-2015

Page	Comment's Scope	Comment's text	Author	Date
	aseguradas con la implementación del nuevo proyecto GEF denominado "BioValor" y por la voluntad de los Directores Nacionales expresada en la última sesión del Comité Directivo, en cuanto a dar continuidad a la mayor parte del personal de cada institución participante, que fuera desarrollado y capacitado por el programa.	de las áreas específicas de las divisiones involucradas, de acuerdo a lo declarado por los Directores Nacionales en la última sesión del Comité de Direccción. Ver comentario anterior		
66	Sin	Acá también agregaría el tema de la nueva dirección de la DNE para la próxima administración y la continuidad de Pedro Soust en la DGF.	Alfonso Blanco	17-feb-2015

Annex 8: Project Logic Framework Matrix

This project will contribute to achieving the following Country Programme Outcomes as defined in CPAP or CPD: Sustainable Environmentally Development.					
Country Programme Outcome Indicators: Number of initiatives of no contaminant development and renewable energy sources are generated.					
Primary applicable Key Environment and Sustainable Development Key Result Area : n/a					
Applicable GEF Strategic Objective and Program: Objective CC-4 "CC-SP4 "To promote on-grid renewable energy - Promoting Sustainable Energy Production from Biomass"					
Applicable GEF Expected Outcomes: "Adoption of modern and sustainable practices in biomass production, conversion and use for modern energy"					
Applicable GEF Outcome Indicators: "Outcome Indicator: tons CO2eq avoided; Outcome Indicator: MW installed; Outcome Indicator: kWh or W steam generated from sustainable biomass"					
	Indicator	**Baseline**	**Targets** **End of Project**	**Source of verification**	**Risks and Assumptions**
Project Objective[24] **To promote the integration of biomass-based power generators into the national electricity grid by the development and implementation of scenarios for the sustainable, large-scale exploitation of domestic forestry biomass resources.**	**(A) Distributed electricity generation using forestry biomass residues supplying to the national grid;** **(B) Stimulating policy instruments in place enabling 100 MW additional capacity to be installed** **(C) Database of forestry biomass residues in relevant regions.** **(D) Operation and safety guidelines for biomass installations.**	**(A) No distributed electricity generation using forestry biomass residues;** **(B) Recent Decrees invite companies to present small biomass projects on an ad-hoc basis;** **(C) No information available about forestry biomass residues for planning purposes;** **(D) No clear guidelines for compliance with safety and environmental**	**(A) At least one 5-MW biomass-based generator in operation under a long-term PPA;** **(B) A consistent set of policy instruments has been designed and implemented enabling widespread use of distributed biomass power in Uruguay;** **(C) Accurate information has been obtained on forestry biomass resources;** **(D) Proper technical guidelines have been designed and**	**Project evaluation, site inspection, assessment of project outputs**	**Risks: (1) Market and technical constraints would not allow the large-scale use of forestry residues for electricity generation;** **(2) Policy development would prove ineffective to stimulate a market for distributed, biomass-based, electricity generation.** **Assumptions: (1) Accessibility of forestry biomass resources is sufficient for cost-effective recollection; (2) The Government of Uruguay is committed to environmentally responsible disposal of biomass residues and the use thereof for energy purposes.**

[24] *Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR*

		standards and operation of biomass installation	**implemented on key aspects of distributed biomass electricity generators.**		
Outcome 1[25] **A comprehensive assessment of domestic forestry resources has been completed as input for policy development, including a survey of market aspects.**	**(A) Database of forestry biomass residues in relevant regions;** **(B) GIS application to retrieve spatial information on forestry biomass residues;** **(C) Economic assessment of the commercial value of forestry biomass resources;** **(D) SEA (Strategic Environmental Assessment) on extraction of biomass residues for energy purposes for the Forestry Sector.**	**(A) No information available about forestry biomass residues for planning purposes;** **(B) GIS application in use with DGF, but not covering forestry residues and economic/logistical parameters;** **(C) Lack of insight in economic drivers behind the market of forestry products and residues;** **(D) No sector-wide SEA available.**	**(A) Accurate information has been obtained on forestry biomass resources;** **(B) An appropriate GIS module has been implemented linking biomass data with economic and technical parameters;** **(C) A detailed assessment (report) provides energy policy makers with adequate information about potential uses of forestry products and residues, including the use for electricity and heat production;** **(D) A SEA has been carried for the forestry sector as a whole.**	**Project evaluation, assessment of project outputs.**	**Risks: This project outcome concerns studies and analyses. No specific risks have been identified.** **Assumptions: (1) the Government of Uruguay maintains its firm commitment of co-financing resources for the PROBIO initiative.**
Outcome 2 **The current policy framework for electricity generation based on biomass residues**	**(A) Insight in economic, technical and logistical aspects of forestry-based**	**(A) Lack of insight in economic, technical and logistical aspects of collection of**	**(A) Adequate determination of key parameters to assess costs and constraints;**	**Official publications, project evaluation, assessment of project outputs**	**Risks: The involved ministries (MVOTMA and MIEM) would withdraw their commitment to PROBIO.**

[25] *All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.*

from forest and agro-industry, has been strengthened.	**biomass collection;** **B) National strategy for use of biomass from forestry, wood processing industry and agro-industry for energy generation;** **(C) Operation and safety guidelines for biomass installations;** **(D) Review of forestry policy framework on energy relevant issues.**	**forestry-based biomass residues;** **(B) Two contracts have been awarded for two 10-MW biomass plants on an ad-hoc basis.;** **(C) No specific guidelines for biomass plants available in Uruguay;** **(D) The existing forestry policy framework does not foresee the use of biomass for energy purposes.**	**(B) Distributed biomass generation is being facilitated within the framework of national energy policy and strategies;** **(C) Guidelines on key issues have been implemented for small biomass generators;** **(D) A review (report) produced including recommendation on relevant aspects of forestry policy.**		**Assumption: The Government of Uruguay is strongly committed to include biomass energy sources in its national policies.**
Outcome 3 **The business opportunities of biomass-based power generation have been promoted among industries, investors and the general public.**	**(A) National companies involved in manufacturing of small biomass generating plants;** **(B) Promotional campaign on biomass targeted investors, manufacturers and general public;** **(C) National seminar on decentralized biomass generation.**	**(A) Metal manufacturing companies (1) produce heaters and vessels for biomass plants according to specifications; limited design and engineering capacity;** **(B) Lack of awareness and knowledge of biomass opportunities;** **(C) Lack of dissemination and exchange of**	**(A) Enhanced design and engineering capacity; more structural involvement of national equipment suppliers (target: 3 companies);** **(B) A broad promotional campaign has increased awareness on biomass among general public; and drawn attention of investors and manufacturers;** **(C) A national seminar has brought together experts and stakeholders**	**Project evaluations, interviews**	**Risks: Local actors (manufactures and investors) would show insufficient interest in distributed biomass technology.** **Assumptions: (1) Market actors in Uruguay are seriously interested in biomass technology; (2) the national electricity company UTE will align will governmental pro-biomass policies and provide a framework for interconnection.**

		knowledge on energy production from biomass.	**in biomass development.**		
Outcome 4 **One biomass-based electricity generator (5 MW) has been installed, supplying energy to the national grid, and a mechanism for widespread replication has been prepared.**	**(A) Feasibility studies, final engineering studies and contracts for pilot biomass–based electricity generator;** **(B) One pilot generating plant constructed and supplying power to the national grid;** **(C) Stimulating policy instruments in place enabling additional capacity to be installed;** **(D) Detailed technical information on operation parameters of distributed biomass plants.**	**(A) Preliminary studies have been made for the private pilot plant under consideration;** **(B) Envisaged pilot biomass plant in prefeasibility stage;** **(C) Recent Decrees invite companies to present small biomass projects on an ad-hoc basis; incentives are non-continuous; Several tax incentives in place.** **(D) Lack of data and experience in Uruguay concerning field performance of small, grid-connected biomass generators.**	**(A) Full feasibility studies, technical designs, contracts and permits concluded for the envisaged pilot plant;** **(B) One 5-MW pilot biomass plant constructed and supplying electricity to the grid;** **(C) A policy framework in place allowing the widespread implementation of distributed biomass plants over a longer timeframe;** **(D) Detailed field data have been collected regarding operational safety, dispatch, GHG benefits, economy and reliability of distributed biomass generators.**	**Project evaluation, site visits, assessment of project outputs, monitoring reports**	**Risks : (1) The biomass pilot plant would not be concluded under the project's time horizon; (2) Conflicting interests would keep the Government from implementing a stimulating framework for biomass.** **Assumptions: (1) Existing experience in Uruguay and commitment of private investors ensure a fast development of the pilot biomass generator based on forestry residues; (2) The newly elected Government is sufficiently strong to push forward its biomass development plans.**
Outcome 5 **A project monitoring and evaluation plan implemented, and lessons learnt are disseminated.**	**(A) Mid-term Evaluation Report;** **(B) Final Evaluation Report;** **(C) Documentation of**	**(A) No MTE;** **(B) No FEV;** **(C) No systematization of lessons-learnt on distributed biomass**	**(A) MTE completed;** **(B) FEV completed;** **(C) Lessons learnt publication;**	**Evaluation reports**	**Risks: No specific risks have been identified related to UNDP/GEF M&E.** **Assumptions: (1) project stakeholders correctly understand UNDP/GEF M&E principles; (2)**

	project experiences; **(D) Sharing of project results.**	**plants in Uruguay;** **(D) No sharing of biomass experiences in the region.**	**(D) Seminar to present project results.**		**national counterparts are committed to the objectives of the Project.**