**Uruguay Wind Energy Programme - UWEP**

(URU/07/G31 Uruguay Wind Energy Programme - UWEP)

**PIMS No. 2292**

**(ATLAS ID 00047426-Project ID. 00056968)**

**FINAL EVALUATION**

(END OF TERM)

**FINAL REPORT**

**(Version 2.0)**

**(WITH COMMENTS)**

**HUMBERTO RODRIGUEZ**

**Consultant**

**Montevideo, June 22, 2013**

Final Evaluation

**URUGUAY WIND ENERGY PROGRAMME (UWEP)**

Uruguay URU/07/G31 Wind Energy Programme - UWEP)

PIMS 2292 (ATLAS ID 00047426-Project ID. 00.056.968)

Region: South America

GEF Operational Program#6: “Remove the barriers to the introduction of large-scale Renewable Technologies connected to the electric grid network”

GEF Strategic Program CC-4: “Promote grid-connected electricity from renewable sources”

Country: Uruguay

Implementing Partner: UNDP

Executing Agency: Dirección Nacional de Energía (DNE).

Evaluation Team Members:

Humberto Rodríguez, Dr. rer. nat.

Consultant in Renewable Energy

[humberto.rodriguez.m@gmail.com](mailto:humberto.rodriguez.m@gmail.com).

**VERSIONS OF THE REPORT**

Draft (V1.0): Delivered on March 28, 2013

English version (V2.0): Delivered May 22, 2013

Final English version (V2.1), delivered June 22, 2013

Includes uphold observations from DNE, UNDP Office Uruguay and

UNDP-GEF Regional Technical Advisor.

content

[0. Executive Summary 0-1](#_Toc361414734)

[1. introduction 1-1](#_Toc361414735)

[2. THE PROJECT AND ITS CONTEXT 2-1](#_Toc361414736)

[2.1 DESCRIPTION OF THE PROBLEM 2-1](#_Toc361414737)

[2.2 Project Objective 2-3](#_Toc361414738)

[2.2.1 Barriers Identified 2-3](#_Toc361414739)

[2.2.2 PRODOC Formulation 2-4](#_Toc361414740)

[2.2.3 Approval of the Project by the GEF 2-4](#_Toc361414741)

[2.2.4 Project Finance 2-4](#_Toc361414742)

[2.3 STARTING DATE AND DURATION OF THE PROJECT 2-5](#_Toc361414743)

[2.4 PROJECT GOAL AND OBJECTIVE 2-5](#_Toc361414744)

[2.5 PROJECT outcomes andoutputs 2-6](#_Toc361414745)

[2.6 projectIndicators, monitoring and evaluation 2-7](#_Toc361414746)

[2.7 implementation and execution of PROJECT 2-8](#_Toc361414747)

[2.7.1 Implementing Agency: UNDP Uruguay 2-8](#_Toc361414748)

[2.7.2 Executing Agency: DNE 2-8](#_Toc361414749)

[2.7.3 Project Steering Committee 2-9](#_Toc361414750)

[2.7.4 Project Coordination Committee 2-9](#_Toc361414751)

[2.7.5 Project Management Unit 2-9](#_Toc361414752)

[2.7.6 Project Coordinator 2-9](#_Toc361414753)

[2.7.7 Other PMU Staff 2-10](#_Toc361414754)

[2.8 Monitoring and evaluation 2-10](#_Toc361414755)

[2.9 Project Schedule 2-11](#_Toc361414756)

[2.10 FINANCING 2-11](#_Toc361414757)

[*DURATION OF THE PROJECT IS 3 YEARS* 2-12](#_Toc361414758)

[2.11 SUSTAINABILITY 2-14](#_Toc361414759)

[2.12 Project Risks 2-15](#_Toc361414760)

[2.13 Replicability 2-15](#_Toc361414761)

[3. FINDINGS AND CONCLUSIONS 3-1](#_Toc361414762)

[3.1 PROJECT FORMULATION 3-2](#_Toc361414763)

[3.1.1 Project Concept / Design 3-2](#_Toc361414764)

[3.1.2 Relevance of the project for the country / Country ownership 3-4](#_Toc361414765)

[3.1.3 Stakeholder participation in the project conceptualization / design 3-5](#_Toc361414766)

[3.1.4 Tracking, Monitoring and Project Management 3-5](#_Toc361414767)

[3.1.5 Other issues 3-6](#_Toc361414768)

[3.2 IMPLEMENTATION OF THE PROJECT 3-6](#_Toc361414769)

[3.2.1 Implementation approach 3-6](#_Toc361414770)

[3.2.2 Monitoring and evaluation 3-7](#_Toc361414771)

[3.2.2.1 Monitoring 3-7](#_Toc361414772)

[3.2.2.2 Participation of the agencies in the project 3-9](#_Toc361414773)

[3.2.2.3 Mid Term Evaluation 3-10](#_Toc361414774)

[3.2.2.4 External Financial Audits 3-11](#_Toc361414775)

[3.2.3 Financial Planning 3-12](#_Toc361414776)

[3.2.3.1 Amount of investment, co-financing and GEF leverage factor 3-12](#_Toc361414777)

[3.2.4 Replicability 3-14](#_Toc361414778)

[3.2.5 Effectiveness of the project 3-14](#_Toc361414779)

[3.2.6 Cost effectiveness of the project 3-15](#_Toc361414780)

[3.2.7 Project Impact 3-16](#_Toc361414781)

[3.2.8 Sustainability 3-16](#_Toc361414782)

[3.2.8.1 Development of Technical Capacity 3-16](#_Toc361414783)

[3.2.8.2 Ownership of Wind Energy Technology 3-17](#_Toc361414784)

[3.2.8.3 Institutional Capacity Building 3-17](#_Toc361414785)

[3.2.8.4 Financial sustainability of the projects implemented 3-17](#_Toc361414786)

[3.2.9 Execution and Implementation modalities 3-17](#_Toc361414787)

[3.3 OUTCOMES 3-18](#_Toc361414788)

[3.3.1 Global Environmental Objective 3-18](#_Toc361414789)

[3.3.2 Outcome 1. An enabling policy framework has been created, including regulations for grid access and dispatch, construction and operation of wind farms, technical codes, and financial incentives for wind-generated electricity. 3-23](#_Toc361414790)

[3.3.3 Outcome 2: Information has been produced and made available to prepare and facilitate identified wind energy projects, as well as information and promotion for stakeholders and the broader public. 3-29](#_Toc361414791)

[3.3.4 Outcome 3: Increased business skills have been developed to prepare and implement wind energy technology within the public and private delivery model. 3-27](#_Toc361414792)

[3.3.5 Outcome 4: Technological barriers have been removed by facilitating measuring equipment and implementing a first 5-MW wind farm connected to the grid. . 3-32](#_Toc361414793)

[3.4 Current project status 3-33](#_Toc361414794)

[3.5 Current Status of the barriers 3-34](#_Toc361414795)

[4. CONCLUSIONS AND RECOMMENDATIONS 4-1](#_Toc361414796)

[5. LESSONS LEARNED 5-1](#_Toc361414797)

[6. ANNEXES 6-1](#_Toc361414798)

[6.1 TERMS OF REFERENCE 6-1](#_Toc361414799)

[6.2 ITINERARY 6-10](#_Toc361414800)

[6.3 LIST OF INSTITUTIONS / INDIVIDUALS VISITED 6-11](#_Toc361414801)

[6.4 Summary OF interviews 6-12](#_Toc361414802)

[6.5 KENTILUX WIND FARM VISIT 6-27](#_Toc361414803)

[6.6 LIST OF DOCUMENTS REVIEWED 6-28](#_Toc361414804)

[6.7 Comments 6-33](#_Toc361414805)

[6.7.1 Uruguay UNDP Comments 6-33](#_Toc361414806)

[6.7.2 DNE Comments 6-34](#_Toc361414807)

[6.7.3 Approval Form 6-36](#_Toc361414808)

[6.7.4 Management and monitoring response template 6-37](#_Toc361414809)

[6.7.5 DVD with the full report 6-38](#_Toc361414810)

[LAST PAGE OF THIS REPORT 6-38](#_Toc361414811)

TABLES

[Table2‑1.ProgramMainEvents 2-5](#_Toc361407360)

[Table 2‑2. Project Costs in 2007 US$ 2-11](#_Toc361407361)

[Table 3‑1.Ratings of project performance evaluations 3-1](#_Toc361407362)

[Table 3‑2. Documentation on M & E (2008-2012) 3-8](#_Toc361407363)

[Table 3‑3.Project evaluation ratings implementation according to the PIR 3-9](#_Toc361407364)

[Table3‑4. Contributions under the PRODOC and executed up to December 2012 3-13](#_Toc361407365)

[Table 3‑5. Estimated avoided emissions GEF costs (reconstruction) 3-15](#_Toc361407366)

[Table 3‑6. Unit cost of emission reduction of UWEP 3-16](#_Toc361407367)

[Table 3‑7. Global Environmental Objective. Indicators and sources of verification 3-18](#_Toc361407368)

[Table 3‑8. Target of wind power and CO2 emission reduction according PRODOC 3-19](#_Toc361407369)

[Table 3‑9. Current and expected wind power 3-20](#_Toc361407370)

[Table 3‑10.Project Direct CO2Emissions Reduction 3-21](#_Toc361407371)

[Table 3‑11. Outcome 1. Indicators and sources of verification 3-24](#_Toc361407372)

[Table 3‑12. Legal and Regulatory Framework for Electricity Sector - Technical and contractual 3-25](#_Toc361407373)

[Table 3‑13. Legal and Regulatory Framework for Wind Energy - Technical and contractual 3-26](#_Toc361407374)

[Table3‑14.EnvironmentalandLand Use Regulation 3-27](#_Toc361407375)

[Table 3‑15. Legal and regulatory tax framework 3-27](#_Toc361407376)

[Table3‑16.WindGeneration Regulation for the Industrial Sector 3-28](#_Toc361407377)

[Table 3‑17. Legal Framework for Micro-Generation - Commercial and Technical Aspects. 3-28](#_Toc361407378)

[Table 3‑18. Outcome 2. Indicators and sources of verification 3-30](#_Toc361407379)

[Table3‑19. UWEP Publications 3-26](#_Toc361407380)

[Table 3‑20. Outcome 3. Indicators and sources of verification 3-28](#_Toc361407381)

[Table 3‑21. UWEP participation in events 3-31](#_Toc361407382)

[Table 3‑22.Outcome 4.Original and revised Indicators and targets 3-32](#_Toc361407383)

[Table3‑23. Generation of Los Caracoles I and II 3-33](#_Toc361407384)

[Table 3‑24. Effect of the project on barriers 3-35](#_Toc361407385)

[Table 6‑1. Air and land itineraries of H. Rodriguez. 6-10](#_Toc361407386)

[Table6‑2. Project Documentation 6-28](#_Toc361407387)

FIGURES

[Figure 2‑1. Project schedule. 2-12](#_Toc361407388)

[Figure 2‑2. Budget by activity and source of funding (2007) 2-13](#_Toc361407389)

[Figure 2‑3.Project Budget (2007) 2-13](#_Toc361407390)

[Figure 2‑4. Participation of project activities in the budget (2007) 2-14](#_Toc361407391)

[Figure 3‑1. Implementation of the proposed GEF resources in PRODOCs vs. actual execution 3-12](#_Toc361407392)

[Figure 3‑2- Resources planned and executed currently by UWEP 3-14](#_Toc361407393)

[Figure 3‑3. Wind capacity provided by the PRODOCs and achieved by the project 3-21](#_Toc361407394)

[Figure 3‑4. CO2 emissions reduction by wind generation 3-22](#_Toc361407395)

[Figure 3‑5.WindMap of Uruguay (90 m height) 3-31](#_Toc361407396)

[Figure 3‑6. Departmental Wind Map of Uruguay 3-31](#_Toc361407397)

[Figure 3‑7.Map of measuring sites and wind farms (2012) 3-24](#_Toc361407398)

[Figure 3‑8.Actors by business activity 3-30](#_Toc361407399)

[Figure 3‑9. Sierra Los Caracoles wind farm (2x10 MW). 3-33](#_Toc361407400)

[Figure 6‑1. Partial view of the wind farm (capacity of 17.2 MW on January 2013) 6-27](#_Toc361407401)

**ACRONYMS AND ABBREVIATIONS**

|  |  |
| --- | --- |
| ADME | Administration of Electricity Market (Administración del Mercado Eléctrico) |
| APR | Annual Project Report |
| AUdEE | Uruguayan Wind Energy Association (AUdEE: Asociación Uruguaya de Energía Eólica) |
| AWP | Annual Work Plan |
| CCA | Common Country Analysis |
| CIU | Uruguayan Chamber of Industry |
| CP | Country Programme |
| DINAMA | National Environment Directorate (Dirección Nacional Ambiental) |
| DNE | National Energy Directorate |
| DNETN | National Energy And Nuclear Technology Directorate |
| GEF | Global Environment Facility |
| GHG | Greenhouse gases |
| GMS | General Management Support |
| GoU | Government of Uruguay |
| GTER | Renewable Energy Working Group (Grupo de Trabajo de Energía Renovable) |
| IADB | Inter-American Development Bank |
| IPP | Independent Power Producers |
| ISS | ISS Implementation Support Services |
| M&E | Monitoring and Evaluation |
| MDG | Millennium Development Goals |
| MIEM | Ministry of Industry, Energy and Mining |
| MSP | Medium Sized Project |
| MTE | Mid Term Evaluation |
| NEX | National Execution Project |
| PCC | Project Coordinating Committee |
| PIR | Project Implementation Report |
| PMU | Project Management Unit |
| PPA | Power Purchase Agreement |
| PRODOC | Project Document |
| PSC | Project Steering Committee |
| UDELAR | University of the Republic (Universidad de la República) |
| UNDAF | United Nations Development Assistance Framework |
| UNDP | United Nations Development Programme |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UPL | Universal Price List |
| US$ | US Dollar |
| UTE | NationalAdministration of Power Plants and Electrical Transmissions (Administración Nacional de Usinas y Transmisiones Eléctricas) |
| UWEP | Uruguay Wind Energy Programme |
| WB | World Bank |

NOTE:

The **DNETN** split into two separate institutions and became **DNE** and **ARNR** in the budget law 18.719 of December 27, 2010.

**UNITS**

kWh kilowatt hour

kW kilowatt

GW gigawatt

MW megawatt

Mt million tons

t metric ton

# Executive Summary

***Uruguay*** ***Wind Energy Programme in Uruguay (UWEP) - UNDP-GEF PROJECT (PIMS Project No. 2292)*** is a project implemented by UNDP and executed by the DNE (Dirección Nacional de Energía, National Energy Directorate of Uruguay)[[1]](#footnote-2). With the decisive participation of this project, an enabling legal and regulatory framework was established for the development of wind energy in the country. A transparent market for wind power was created and 43.45 MW have been introduced in the country through December 2013 and several projects are in development which by December 2015 are expected to total 990 MW, far exceeding project goals and converting wind power into a major energy source for the country. Technical and institutional capacity was developed and emission reduction goals of the project were achieved.

Uruguay is a country that lacked fossil fuels (both at the time of the project formulation and at present), and for its power supply depended on hydropower and imported fossil fuels. Since hydropower potential was practically exhausted, gas was expected to play a major role to meet growing electricity demand in coming years, estimated at the time at 3% annually. The gas plants were at that time the preferred alternative but had the following consequences for Uruguay (i) increasing dependence on imported energy, (ii) impact of gas price fluctuations in the international market on the national economic and (iii) increased emissions of greenhouse gases. In this situation, the country decided to use renewable energy in the country, mainly wind power and biomass.

For the introduction of wind power, the project identified the following barriers:

* *Policies*
  + Insufficient and / or inappropriate transparent regulations to install and operate wind turbines connected to the grid, including network access and preferential dispatch.
  + Lack of an enabling policy framework that allows third parties to embark on wind energy investments, for example under Power Purchase Agreements (PPAs) with the national company Administración Nacional de Usinas y Transmisiones Eléctricas (UTE, National Administration of Power Plants and Electrical Transmissions )
  + Underdevelopment of technical standards, building codes and electricity, and environmental guidelines for wind energy systems.
  + Unattractive low return on wind projects investment selling electricity to the grid and as a result, lack of interest among investors and developers to invest in wind energy.
  + Lack of long-term financial incentives to be paid for wind generated electricity, based on an evaluation of the benefits to the economy and national society.
* *Capacity and business models*
  + Insufficient capacity and skills between public sector actors (DNE and UTE) and private sector to implement wind energy investments in Uruguay.
  + Lack of a mandate within UTE to promote and deploy wind energy systems.
  + Limited understanding on implementation and operation of wind technology in Uruguay.
* *Information*
  + Insufficient detailed information related to the wind potential in Uruguay.
  + Lack of incoming information to develop a first group of commercial wind farms.
* *Technology*
  + Lack of financial resources and technical equipment to gather data on winds and make them available to parties interested in future investments.
  + Absence of successful large-scale wind energy projects in Uruguay.

While the barriers aforementioned prevented the development of wind energy in Uruguay, it is worth noting that two basic conditions had already been fulfilled to allow UWEP to remove the barriers identified in Uruguay:

* 1. The recognition by the Government of Uruguay (GoU), represented by Ministerio de Industria, Energía y Minería (MIEM, Ministry of Industry, Energy and Mining) and UTE, to review the cost of wind energy reference, implying extension of the mandate for the latter.
  2. The political will by the GoU to accept and facilitate the entry of private generators in the electricity sector.

These conditions involved a breakthrough for the introduction of decentralized renewable energy sources (including wind power) in the national electricity system and were a breeding ground for the development of UWEP.

The *expected situation at the end of the project* regarding barriers was that by removing those through project execution, a nationwide effect for wind power penetration would be generated, using a renewable energy resource and allowing emissions reductions of greenhouse gases.

The project objective is to contribute to the elimination of existing barriers to the development of wind commercially viable energy investments in the country and the establishment of a 5 MW demonstration wind project for replication. The project will promote wind power generation, contributing to the sustainable development of the energy sector in Uruguay. The activities proposed in this project will remove barriers to the adoption of wind energy in generating electricity in Uruguay, including institutional, regulatory, financial, technological and social barriers.

The Global Environmental Objective (Project Goal) is to reduce emissions of greenhouse gases through the implementation of large-scale wind power connected to the grid in Uruguay. Directly avoided emissions are 0.18 Mt of CO2 in the life cycle (20 years) of a 5 MW wind power plant. Indirectly avoided emissions are 1.1 Mt of CO2 in the period 2006-2015, with annual savings after 2015 from a low of 0.26 Mt CO2.

The *project is consistent* with the objectives of Operational Program # 6: Removing the barriers to the introduction of large-scale Renewable Energy Technologies connected to the grid (specifically wind energy) in Uruguay, and creating the basis for replication and maintenance. It also fits perfectly under GEF CC-4 Strategic Objective which is to promote grid-connected electricity from renewable sources. *The project is also in line with the environmental policy of Uruguay*.

The project strategy designed products aimed at removing each of these categories of barriers. In order to remove the barriers identified, these were thoroughly analyzed in the Project Document (PRODOC) formulation, and the execution of a Medium Size Project, with the following four outcomes was contemplated:

1. An enabling policy framework has been created, including regulations for access and dispatch to the network, for construction and operation of wind farms, technical codes and financial incentives for wind generated electricity
2. Information has been produced and made available to prepare and facilitate identified wind power projects, as well as information and promotion for stakeholders and the general public
3. Increased business skills have been developed to prepare and implement wind energy technology within the public and private delivery model.
4. Technological barriers have been eliminated through the provision of measuring equipment and the implementation of the first 5-MW wind power plant connected to the grid

The project start date was July 1, 2007, with an initial term of three years (until June 30, 2010). The time limit has been extended several times due to delays in the recruitment of staff at the beginning of the project (the first transfer of funds occurred on January 25, 2008), and several reviews of the project included adjusting activities and budget year to year. Total budget was not modified (GEF, US $950,000 and UNDP, US $35,000), with only an addition from MIEM in June 2012 of $ 15,000.

Time extensions totaled three years. This project has been implemented in double the initial term. The project on January 2013 was in the stage of Final Evaluation, thus complying with this GEF requirement.

Uruguay UNDP as the project implementing agency has managed the project in accordance with administrative regulations and procedures, also complying with the tasks established in the PRODOC.

The project executing agency is the DNE (NEX execution) and was responsible for overall project development and day to day implementation. The DNE assigned the project to a task force within the DNE, which was in charge of the project and its execution. The DNE also assigned a Project Leader, responsible for maintaining and developing project initiatives aligned with project objectives[[2]](#footnote-3).

The project established a *Project Management Unit* (PMU) with a Project Coordinator and a Unit in charge of Administration / Secretariat[[3]](#footnote-4). The PMU was located in the DNE. The Project Coordinator was responsible for the daily operations and the designation of the GEF financial contributions according to quarterly plans and budget, and financial bookkeeping. He was also responsible for the oversight of specific project activities and meetings convened between the DNE and UNDP.

The project created a Project Steering Committee (PSC) formed by the PMU, the Project Leader and the Technical Assistant, the UNDP Programme Officer in charge of the project country, and the representative of UNDP / GEF

The project established a detailed *initial schedule* of the activities to be performed for each outcome, which was adapted in the course of execution.

The PRODOC logical framework matrix established performance and impact indicators for project implementation. These indicators and sources of verification are the basis of the monitoring and evaluation which have been employed by UNDP and the DNE.

The total project budget is US$ 6.96 million, not including the PDF-B which has a cost of US $ 55.800 (GEF: US $ 50,000 and MIEM: US $ 5.800)[[4]](#footnote-5). The co-financing from the Government of Uruguay was US $ 5.75 million, an important determinant factor for project success.

This *Final Term Evaluation* is intended to determine the relevance, performance and success of the project, looking for signs of potential impact and sustainability of results, including the project's contribution to capacity development and the achievement of global environmental goals. It also hopes to identify and document lessons learned and make recommendations that might improve design and implementation of other UNDP / GEF projects. The main results and findings[[5]](#footnote-6) of the Final Term Evaluation are:

**Project Formulation**

For the formulation of the project, a profile of the energy situation in the country was performed to characterize the barriers that wind power penetration had and the results proposed to remove the identified barriers. All these elements are well intertwined in the concept of the project, which is in line with the long-term country energy strategy. The 4 outcomes of the project and its components follow a coherent logical framework to remove the identified barriers and to achieve the achievement of objectives. In this logical framework indicators were also made for each outcome, the goals to be achieved and the means of verification. Therefore, it is considered that the *PRODOC contains the elements necessary for the implementation and execution of the project*. *Monitoring, follow-up and evaluation mechanisms are established by UNDP in these projects and have been satisfactorily completed.*

Risk analysis of the project considered two types of risks associated with the positions taken by the parties involved in the execution of the project and the project executor's ability to carry it out successfully. A second risk was the inability to obtain and effectively build the 5 MW demonstration wind farm planned. These risks were considered low and the project confirms the validity of this assumption since the UWEP was warmly welcomed by the executor DNE and supported by the UTE and Universidad de la República (UDELAR, University of the Republic) two of the institutions engaged in the execution.

The *formulation* of the project is ***Highly Satisfactory (HS).***

**Implementation of the project**

The implementation approach is simple and transparent. The DNE as Executing Agency was responsible for the overall project development and day to day implementation. UNDP as Implementing Agency is accountable to the GEF Council in charge of financial management and responsible for the desired results for the project.

The DNE assigned the project to a task force within the DNE with partial responsibility for the activities of the project and provided the Project Leader, responsible for maintaining the project in the right track and developing specific initiatives that are aligned with the objectives of the project.

The logical framework was the guideline throughout implementation. The Work Plan that guided the implementation was presented at the PRODOC. This Plan was adjusted periodically to meet the project in an agile and adaptive way. The work plans for implementation were processed according to UNDP administrative procedures to approve the resources that would be executed each year.

The evaluator considers that the *implementation* approach is ***Highly Satisfactory (HS).***

**Monitoring and evaluation**

From a review of the information received, it was possible to infer the following compliance monitoring mechanisms:

* Monitoring mechanisms established by UNDP using ATLAS were used.
* The DNE as executing agency has dealt with the daily work using the Annual Operating Plans (AOP) and Annual Work Plans (AWP).
* In this project all PIR / APR (PIR: UNDP GEF Project Implementation Reports and APR: UNDP Annual Project Report) were elaborated from the first for the period July 2007 - June 2008 to the last for the period July 2011 to June 30 2012
* Progress evaluation of the project Development Objectives (DO) was always Highly Satisfactory (HS), although for several years the concept of the GEF operational point in Uruguay was missing and in 2001-2012 it was the concept of GEF UNDP Regional Advisor. Thus, on average each year the project was evaluated as HS.
* Progress evaluation for project implementation was rated between Highly Satisfactory (HS) and Satisfactory (S) for the period 2008-2012.
* Overall project performance has been rated in the entire period between S and HS.
* Project Progress Reports. They consist of APR / PIRs. Final reports are also products of the sub-contracts carried out by the consultants and consulting firms.
* Final Project Report. As of December 2012 this report had not been elaborated.
* Meetings of the Project Coordinator. Six Project Steering Committee Minutes were received corresponding to meetings held in 2008, 2009 y 2011 but none in 2010 and 2012. They make presentations of the project state of development and its current status, and recommends actions to redirect its course.

The evaluator considers *UNDP gave systematic monitoring of progress of activities*, and therefore considers that the *monitoring and follow-up of the project is* ***Satisfactory (S).***

**Participation in the project agencies**

* The DNE as the executing agency has responded according to its planning duties helping to enable a proper legal and regulatory framework for the development of wind energy. The UWEP was designed to support management and facilitated the achievements in the fields of DNE and those goals reached in the interaction with the UTE, Dirección Nacional Ambiental (DINAMA, National Environment Directorate) and other agencies involved.
* UNDP Uruguay has had a close and intense work in the project facilitating UWEP development and promoting interaction between the different actors of the project with its management and summoning capacities at all levels with the participating agencies.
* UTE has developed wind farms on its own initiative but has also demanded wind generation involving the private sector and enabling their participation in the market as external generators to the UTE system. UWEP interaction facilitated the development of internal capabilities and contributed to the development of technical, economic, environmental and social terms for the of generation projects.
* Participation of Grupo de Tecnología de Energía Renovable (GTER, Renewable Energy Technologies Group) of UDELAR has been instrumental in the development of technical components of the project and the wind resource assessment, support for the development of wind measurement network, microanalysis of several projects, among others. However, the rapid development that has taken place in wind power in the country has reached levels of knowledge and expertise in the development of wind farms that have exceeded national capacities and led to the rapid search for foreign know-how. Accompanying future developments from the academic sector is a formidable challenge.
* UWEP´s interaction with DINAMA produced the Strategic Environmental Assessment (SEA) for the energy sector. While the SEA contains basics on wind energy, the elements should be studied deeper and that requires sufficient qualified staff at DINAMA.

**Medium Term Evaluation**

Medium-Term Evaluation was suspended for reasons beyond the project´s scope of action and was replaced by a Support Mission conducted in 2011 by the consultant R. Rijs. The objective of the mission was to assess the degree of progress of the project towards expected results in the Project Document, and make recommendations for the remaining period. The final term evaluator considers very accurate the recommendations of the Mr. Rijs Support Mission.

**External Financial Audits**

All financial management and relevant supporting documentation was handled by UNDP-Uruguay.

In accordance to UNDP rules, this project should conduct an audit. UNDP hired a financial audit with an external accountants specialized firm. UNDP received the audit for the period January 1 to December 31, 2010. The report is clean and without comments.

The evaluator considers that *UNDP gave systematic monitoring of progress of activities, and therefore considers that the monitoring and follow-up of the project is* ***Satisfactory (S).***

**Co-Financing**

According to PRODOC, the total initial project budget was US $ 6.96 million, of which US $ 225,000 corresponded to contributions in kind from the GoU and $ 5,750,000 in cash contribution by the GoU to implement a wind farm of 5 MW.

But the GoU through UTE installed not 5 MW but two parks of 10 MW each, for a total of 20 MW, four times the target set for generating capacity in the PRODOC. The cost of Caracoles I (park of 10 MW) was MUS$ 27.5[[6]](#footnote-7). The cost of Caracoles II (park of 10 MW) was MUS $ 26, considering that the power line had been elevated in the first stage of the park[[7]](#footnote-8). Total co/financing was then MUS $ 53.5 for 20 MW at a cost of US $ 2,675 / kW installed.

According to the PRODOC the relationship of co-financing of the GEF grant is 7.33 (= 6,960,000 / 950,000). Taking into account the investments in both wind farms and other in-kind for a total of MUS $ 54.72, the relationship between these costs and the GEF grant is 56.3!

The *leverage* in the project is 56! for the GEF, and the evaluator considers this factor ***Highly Satisfactory (HS).***

**Replicability**

The project considered that one of the risks for the replication of the project would be the non-participation of the stakeholders, especially the private sector in the development of wind energy. The DNE with the support of UWEP achieved an enabling legal and regulatory framework that has promoted the development of wind energy in the country; projects currently under development to be implemented are to provide 990.3 MW by 2015.

Therefore, the expansion of wind energy in the country underway and *replicability* of wind projects connected to the grid within the context of UWEP is ***Probable (P).***

**Effectiveness of the project**

The results discussed and evaluated below show clearly that all the outcomes planned were achieved and specifically the level of penetration that has reached wind energy in the country, which surpassed these goals. *Therefore, the UWEP has been a determining factor in the development and penetration of wind energy in Uruguay.*

The project has by far achieved its objectives and is in terms of *effectiveness* ***Highly Satisfactory (HS).***

**Cost-effectiveness of the project**

"The UWEP goal was mitigating greenhouse emissions through the implementation of large-scale wind power connected to the grid in Uruguay. Directly Avoided emissions are 0.18 Mt of CO2 in the life cycle (20 years) of a 5MW wind power plant of. Indirectly avoided emissions are 1.1 Mt of CO2 in the period 2006-2015, with annual savings after 2015 of a minimum 0.26 Mt CO2 "[[8]](#footnote-9).

"Cost efficiency of the GEF contribution to the UWEP UNDP / GEF initiative is under PRODOC in terms of GEF grants expended per unit of CO2 emissions avoided, 0.78 US $ / ton CO2 linked to emissions avoided indirectly "[[9]](#footnote-10).

But UTE did not implement a 5 MW power but implemented a 2x10 MW park (Caracoles I and II), four times more than initially expected and furthermore the country is developing a program of wind power that will reach 990 MW in 2015.

Direct emissions avoided by 2015 will reach 1.31 MtCO2, indirect 7.83 MtCO2 and 9.14 MtCO2 in total. By 2016 when new plants begin operating for a total installed power of 990 MW at the end of 2015, avoided direct emissions will reach 3.09 MtCO2, indirect 18.53 MtCO2 and Total 21.61 MtCO2.

Taking into account the cost of GEF investment US $ 950,000 and reduced emissions by UWEP in 2015 and in 2016 (including the plants that enter into operation on December 2015), the cost of avoided emissions is to be US $ 0.104/tCO2 t/ and $ 0.044 CO2, respectively.

These figures are 7.6 and 18.1 times lower respectively than the expected figure of US $ 0.79 of the PRODOC. The *cost-effectiveness of the project* is ***Highly Satisfactory (HS)*** for the UWEP, the Government of Uruguay and the GEF.

**Sustainability**

The following four elements contribute to the sustainability of the project. First, the project has developed both the technical capacity mainly in UTE and DNE, the two leading institutions for the development process of wind energy. In developing UWEP activity, knowledge and information was spread to all stakeholders, information was made available on the project website (See <http://www.energiaeolica.gub.uy/>).

Second, various actors among which the DNE, UTE, DINAMA, GTER of UDELAR, private sector actors, among others, have appropriated wind technology and its legal, regulatory, operational, environmental, social and economic aspects.

Third, there has been institutional capacity building mainly in the DNE and UTE. In these institutions, wind energy has positioned itself as a valid source of renewable energy for the country. Other beneficiaries are DINAMA and regional governments through the project approach with the regional authorities and the community in general.

And fourth, the financial sustainability of the project is credible through the projects implemented and the many projects that are being developed by the UTE and the private sector, in which private investors were guaranteed PPAs with fees close to US $ 65/MWh for the most recent projects and higher figures for the oldest.

Taking into account the above considerations we can say that the *sustainability of the project is* ***Probable (P).***

**Project Outcomes**

**Global Environmental Objective.** To mitigate Greenhouse Gas Emissions by Implementing large-scale, grid-connected wind energy systems in Uruguay

Final goal: Directly avoided emissions in Uruguay of 1.1 Mton C02 in 2006-2015 due to installed capacity, annual savings after of a minimum 0.26 Mton C02 due to installed capacity.

There are 5 indicators for the overall goal.

Achievements:

* No 5 MW demonstrative wind power central was built but instead 2x10 MW were built (4 times expected).
* The wind power installed by December 2012 reached 43.45 MW.
* The installed wind power will reach 450.7 MW by December 2015 against 150 MW planned in PRODOC, a figure three times higher than UWEP goals.
* In December 2016, the total installed capacity will reach 990.25 MW by multiple development projects in course and already awarded, 6 times higher than expected from PRODOC of 150 MW by the end of 2015.
* Avoided emissions during the period 2006-2015 will reach 1.31 MtCO2, higher than the 1.1 MtCO2 of PRODOC (119%).
* As of 2015, emissions reductions will reach 0.81 Mt CO2/year, compared to 0.26 MtCO2/year expected in the PRODOC, a figure three times higher than expected.

The evaluator considers that, given the results achieved and the prospect of future development on a three year time horizon, with the implementation of the projects already awarded, the fulfillment of the global objective is ***Highly Satisfactory*** ***(HS)***

**Outcome 1.** An enabling policy framework has been created, including regulations for grid access and dispatch, construction and operation of wind farms, technical codes, and financial incentives for wind-generated electricity

There are four indicators for the outcome.

Achievements:

* An enabling legal framework for the introduction of wind energy was developed including regulations for grid access and delivery, construction and operation of wind farms, technical codes contractual, environmental, tax and financial incentives for wind power generation.
* This framework has allowed UTE to contract and deal with wind power private generators, creation of dispatch conditions for wind power, extend the lease of the sites for the development of wind farms, among others.
* The established market is competitive and transparent, with large private sector participation.
* It has established a framework of investment incentives and incentives for national industry participation in the project.
* It has established a legal framework for industrial wind generation
* It has established a legal and regulatory framework for micro wind power generation
* Appropriate standards have been developed, adopted and employed by the UTE, and these are formally in the approval process by the Regulatory Unit of Electricity and Water (URSEA).
* It established a procedure of certification of origin of components to stimulate the development and participation of the domestic goods and services industry.
* It developed a Strategic Environmental Assessment for the energy sector that requires regarding wind energy greater depth by DINAMA.

The project has met the ***Outcome 1 Satisfactorily (S).***

**Outcome 2.Information has been produced and made available to prepare and Facilitate identified wind energy projects, as well as information and promotion for stakeholders and the Broader public**

There are four indicators for this outcome

Achievements:

* The project was developed in partnership with the GTER of the University of the Republic through which the wind map of Uruguay was developed.
* The project installed four wind measurement stations of which three are in operation since September 2010.
* Feasibility studies were developed for two wind farms (Caracoles I and II).
* As for the creation of knowledge and awareness about wind energy opportunities between relevant stakeholders and society in general, a contribution of the project was to have acted as a facilitator and catalyst for the creation of the Asociación Uruguaya de Energía Eólica (AUdEE, Uruguayan Association of Wind Energy)[[10]](#footnote-11), which is dedicated to promoting, bring companies and people together around issues and projects supporting the use of wind energy
* Stakeholders, government and the general public attended numerous events covering various aspects of wind energy. Particular attention should be given to the work with municipalities and land owners on the use of land for wind farms.
* The project produced 25 publications on wind energy and micro-scale generation distributed through an excellent website: <http://www.energiaeolica.gub.uy/>.

The evaluator considers the achievements of *Outcome 2 as* ***Highly Satisfactory (HS).***

**Outcome 3: Increased business skills have been developed to prepare and implement wind energy technology within the public and private delivery model.**

This outcome has three indicators**.**

Achievements:

* The project has contributed decisively to the development and strengthening of capacity in both the DNE and UTE. In the UTE, the UWEP financed with program resources two engineers who remained in the UTE in Generation Division during the execution of the project and that have been absorbed by the institution.
* The project organized and / or its officers participated in nearly 16 events of various kinds designed to: inform the development of UWEP, strengthen the capacities of different stakeholders, specific training on topics related to technology, promotional aspects as tax benefits and regional integration with Mercosur countries, among others.
* Regarding capacity building in companies interested in wind power, there are currently in Uruguay 177 stakeholders and participants in the development of wind energy. At the beginning of the project in 2007, the core players were reduced to teachers and researchers from UDELAR and several officials at UTE or DNE. This shows an explosion of stakeholders in a 5 year period, which is an important result.

The evaluator considers the achievements of *Outcome 3* as ***Satisfactory (S).***

**Outcome 4: Technological barriers have been removed by facilitating measuring equipment and implementing a first 5-MW wind farm connected to the grid.**

This outcome has two indicators.

Achievements:

* The project bought seven wind measuring stations; four of which have already served three years of operation.
* An information management system was designed and implemented and is currently operated by the UTE and made up of UTE measuring equipment and receiving information from over 20 stations.
* The UTE developed in the Sierra de Los Caracoles a 2x10 MW Park (December 2008, June 2010), four times higher in power than expected by the project. The cumulative generation of these two parks by January 1, 2013 reached 224,538 MWh with a cumulative reduction of 0.131 MtCO2 emissions.

It is considered that the *Outcome 4 is* ***Highly Satisfactory (HS)***.

**Project execution**

It is considered that the quality of the ***UNDP implementation*** has been ***Satisfactory (S).*** The ***execution quality*** *of DNE is considered* ***Satisfactory (S).***

Therefore, the ***overall quality of the implementation and execution*** of the project is considered ***Satisfactory (S).***

**CURRENT STATUS OF THE BARRIERS**

The evaluator considers that after executing this project, the current status of the barriers is as given in the next table.

**GLOBAL EVALUATION**

Next table shows the summary of project performance evaluation ratings for monitoring and evaluation, for performance of implementing and executing agencies, and evaluation of results and sustainability.

**Ratings of project performance evaluations**

|  |  |  |  |
| --- | --- | --- | --- |
| **1. Monitoring and evaluation** | **Rating** | **Two. Executing Agency and Implementing Agency** | **Rating** |
| Monitoring design and evaluation at the beginning | **S** | UNDP Implementation quality. | **S** |
| Implementation of Monitoring and Evaluation Plan | **S** | Quality of execution - Executing Agency | **S** |
| General Quality of Monitoring and Evaluation | **S** | Overall quality of the implementation / execution | **S** |
| **Three. Evaluation of results** | **Rating** | **April. Sustainability** | **Rating** |
| Relevance | **HS** | Financial Resources | **P** |
| Effectiveness | **HS** | Socio-political | **P** |
| Efficiency | **HS** | Institutional framework and governance | **P** |
| Overall rating of project outcomes. | **S - HS** | Environment | **MP-P** |
| **Rating of outcomes**  Global Environmental Outcome  Outcome 1  Outcome 2  Outcome 3  Outcome 4 | **HS**  **S**  **HS**  **S**  **HS** | In overall, the likelihood of sustainability | **P** |

\* Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U) and Highly Unsatisfactory (AI). For sustainability: Probable (P), Moderately Probable (MP), Moderately Unlikely (MU), Unlikely (U).

The whole project can be considered as ***Satisfactory (S) to Highly Satisfactory (HS),*** with 2 Satisfactory outcomes and 3 Highly Satisfactory outcomes

**Effect of the project on barriers**

| **TYPE OF BARRIER** | **STATE OF THE BARRIER BEFORE THE PROJECT** | **STATE OF THE BARRIER AFTER THE PROJECT** |
| --- | --- | --- |
| *Political and regulatory* | * Insufficient, and / or inappropriate transparent regulations to install and operate wind turbines connected to the grid, including grid network access and preferential dispatch. * Lack of an enabling policy framework that allows third parties to embark on wind energy investments, for example under PPA with the national company UTE. * Low development of technical standards, building and electrical codes, and environmental guidelines for wind energy systems. * Unattractive investment return on wind projects selling electricity to the grid and as a result, lack of interest among investors and developers to invest in wind energy. * Lack of long-term financial incentives to be paid by wind generated electricity, based on an assessment of the benefits to the economy and national society. | * Currently there is a legal and regulatory framework available for enabling installation and operation of wind turbines connected to the grid and with preferential dispatch. * There are various kinds of contracts signed between the UTE and wind generation developers. * There are in UTE, technical standards, building codes and electrical codes for wind generation. *Environmental guidelines for wind energy systems still need to be strengthened.* * There are contracts between UTE and private investors indicating appropriate return for investors * The development scheme does not include subsidies for wind power.   ***The regulatory political barrier was almost completely removed (it still requires further strengthening of environmental guidelines) and there is an appropriate environment for adjustments as the development of wind energy in the country continues.*** |
| *Capabilities and business models* | * Insufficient capacity and skills between public sector stakeholders (DNE and UTE) and private sector investments to implement wind energy in Uruguay. * Lack of mandate within UTE to promote and deploy wind energy systems. * Limited understanding on the implementation and operation of wind technology in Uruguay | * DNE and UTE, Governmental institutions, and private sector have developed capacities to implement wind energy investments. * UTE has a clear mandate to promote and install wind power systems with different types of contracts * There is a good understanding by the DNE, UTE, investors and wind energy developers in Uruguay on the implementation and operation of wind technology.   ***The barrier of capabilities and business models has been removed.*** |
| *Information* | * Insufficient detailed information related to the wind potential in Uruguay. * Lack of incoming information to develop a first batch of commercial wind farms | * There is a wind information system in operation which has given enough information about the wind potential to current developments. * This has allowed the development of a total of 43.45 MW of wind power until December 2012, of this 20MW of which were developed directly by the UTE. * By 2015, close to 990 MW of wind power will be installed.   ***The information barrier has been removed.*** |
| *Technology* | * Lack of financial resources and technical equipment to gather information on winds and to make them available to interested parties on future investments. * Lack of successful large-scale project wind energy in Uruguay. | * Governmental institutions DNE and UTE, and private investors have developed capacities to implement wind energy investments. * UTE has a clear mandate to promote and install wind power systems with different types of contracts * There is a good understanding by the DNE, UTE, investors and therefore wind energy developers in Uruguay on the implementation and operation of wind technology.   ***The technology barrier has been removed.*** |

**CONCLUSIONS AND RECOMMENDATIONS**

**To DNE**

Conclusions

* ***The UWEP has contributed significantly to positioning and develop wind power as a renewable energy source for electricity generation in Uruguay.***
* Establishing a long-term energy policy with a comprehensive and multidimensional character considering technological, economic, geopolitical, environmental, social and ethical aspects, and including renewable energy (solar, wind, small hydro and biomass) and energy efficiency of environmentally and economically sustainable manner, is an extraordinary achievement that has been a key factor for the successful establishment of an enabling legal and regulatory framework for the introduction of wind power generation in the country.
* A second success factor has been the ¨country's image¨ according to which the country risk for private investors is low, the long tradition of honoring its commitments UTE (AAA-rated company), transparency by using a business model without subsidies, and the opening and appropriate business environment for private investors.
* The use of wind energy is in line with energy policy, social, labor and environmental development of the country.

Recommendations

* To ensure sustainability of the of the wind power systems is recommended to strengthen the capacity of the actors, in which UDELAR through its GTER should play a major role.
* The know-how and expertise gained by the actors in Uruguay is a potential source of supply of goods and services to the countries of the region.

*The following recommendations should be implemented before the deadline for implementing the June 31, 2013 and its implementation should be reported in the Final Report of UWEP.*

* Document all agreements made with beneficiaries, duly signed.
* Attach the inventory of equipment and services received by the UWEP, auditing records and reception of studies, and collect the installed equipment warranties.
* Formalize (legalize) the transfer of goods and services delivered to the beneficiaries, according to UNDP procedures
* Prepare the Final Report of the project.
* Organize UWEP Closing Event in partnership with UNDP / GEF including presentation of results and the final evaluation.

**To UNDP**

Conclusions

* The success of this project is the result of successful identification of barriers and planning, the proper implementation of the project strategy and selection of the executor, institutional arrangements and the support of UNDP.
* Furthermore, the project had the advantage of having a long term state energy policy term in which wind energy was a major player.
* The project not only removed the barriers but the outcomes and actions of the actors aim to change the country's energy matrix with strong participation of wind power.
* The UWEP has empowered local stakeholders through capacity building and promoting their organization.
* It has been demonstrated once again the importance of a Medium Term Assessments, replaced this time by a technical assistance as a means to redirect the course of the projects.

Recommendations

* The information generated, evaluated experiences and lessons learned in the UNDP / GEF projects should be shared across a knowledge and information platform. The countries of the region have much to learn from UWEP.

**LESSONS LEARNED**

* 3 years initially proposed to run a program that expects to remove barriers at national level, as intended in the design, is a short time, especially considering that some of the results required the participation of different stakeholders.
* The project started on an unusual moment in which the host nation of the project has set a long-term energy policy including renewable energy, in such a way that the project was facilitator and catalyst for action that led to the success of project.
* The implementation strategy of the project was very successful in selecting the project participants, the DNE with the strong backing of the UTE, linking the planning sector, and the generation and supply sectors
* Another element of the strategy that has been a success factor was to include a core of specialists in wind power generation unit of UTE, funded by the UWEP, with the commitment of UTE of absorb them at the end of the project. This strategy was seen in the PRODOC as preferable to the direct support to the private sector, which proved to be valid.
* The response of the UTE to the generation and co-financing of the project has been unique in that installed four times its generation capacity commitments and invested sevenfold the investment commitments established in PRODOC. This positive response of UTE to wind energy is not only derived from the commitment to the implementation of the long term energy strategy but also has strong roots in all the basic knowledge and the potential wind resources derived from the activity of GTER of UDELAR with the facilitation and catalytic action of the UWEP.
* The development of wind energy in Uruguay has already acquired its own dynamic, but the issue of the introduction of hybrid wind power systems for the rural sector is far of being resolved. This technology plays an important role in the goal of an Uruguay fully electrified by 2015 and also opens the opportunity for new cooperation projects.

# introduction

The United Nations for Development (UNDP), the project implementing agency for the ***Uruguay Wind Energy Programme (UWEP) - UNDP-GEF PROJECT (PIMS Project No. 2292****)* hired Humberto Rodriguez (hereinafter, the evaluator) to conduct the Final External Evaluation of the Project. This external evaluation is considered in the Project Document (PRODOC[[11]](#footnote-12)).

The following Final Term Evaluation is intended to determine the relevance, performance quality and success of the project. It seeks to identify the impact and sustainability of results, including the contribution to capacity building and the attainment of global environmental goals. It also seeks to identify and document lessons learned and make recommendations that might improve design and implementation of other UNDP / Global Environment Facility (GEF) projects.

Through this evaluation, there is an opportunity to learn about the success or failure of the project, the sustainability of results and an assessment of lessons learned. It aims to achieve the following goals:

* Analyzing project implementation,
* Reviewing project achievements related to the fulfillment of project goals and expected results,
* Establishing project relevance, performance and success, including sustainability of results,
* Gathering and analysis of specific lessons and best practices on strategies used and implementation arrangements, which may be relevant to other projects in the country and in other countries.

The **evaluation methodology** included:

* *Document review (prior to the visit to Montevideo).* The review analyzed the PRODOC, PIRs and determined key factors in which the evaluator should focus, all linked to goal achievement as well as project implementation and execution. This documentation was received from UNDP Uruguay and the Project executing agency, the DNETN[[12]](#footnote-13).
* *Interviews.* At the beginning of the mission in the country, the evaluator met in Montevideo with the following authorities, in order to obtain information and views on the project:
  + In UNDP
    - Susan McDade, UNDP Resident Representative
    - Aldo José García, UNDP Deputy Resident Representative
    - Rafael Bernardi, Policy and Program Unit, UNDP
  + National Directorate of Energy (DNE), Ministry of Industry, Energy and Mining (MIEM)
    - Dr. Ramón Méndez Galain, Secretary of Energy
    - Sierra Wilson, Renewable Energy Unit, Head
    - Jorge Peña, Uruguayan Saving and Energy Efficiency Trust, Operations Manager, former UWEP Coordinator
    - Paul Caldeiro, Renewable Energy Unit
    - Virginia Echinope, Office of Electrical Energy, Head.
  + National Administration of Power Plants and Electrical Transmissions (UTE: Administración Nacional de Usinas y Transmisiones Eléctricas)
    - Dr. Ing. Gonzalo Casaravilla, President
    - Oscar Ferrero, Generation Area Manager
    - Daniel Pérez Benech, Mechanical Industrial Engineer, Former UWEP Coordinator
    - Ignacio Afonso, Engineer
  + Administration of Electricity Market (ADME: Administración del Mercado Eléctrico)
    - Gabriela Batista, International Relations and Cooperation Unit, Coordinator
  + Uruguay Wind Energy Programme (UWEP), former officials
    - Eliana Cornalino, Technical Consultant, wind measurements.
    - Eliana Melognio, Economist
    - Nicolás Castroman, Economist
    - Enzo Melani, Technical Consultant
  + National Environment Directorate (DINAMA)
    - Jorge Rucks, Director
  + University of the Republic (UDELAR: Universidad de la Republica)
    - Dr. Ing. José Cataldo, Professor
    - Gutiérrez Alejandro Arce, Professor
  + Uruguayan Chamber of Industry (CIU: Cámara de Industrias del Uruguay)
    - César Bourdiel Blanco, Director of Foreign Trade Operations
    - Aldo Felici, Advisor
  + Uruguayan Wind Energy Association (AUdEE: Asociación Uruguaya de Energía Eólica)
    - Eduardo Abenia, Past President and Institutional Relations
    - José E. Perruccio, President
  + Wind energy companies
    - Juan Pablo Saltre, VENTUS, Engineer
    - Antonio Azziz, PARTILUZ SA, Director,
    - Tabaré Pagliano, , SOWITEC, Director
* Visit to the wind farm Kentilux. The aim was to visit the wind farm and get information from the park operator on its features (equipment, units, operating time, etc.).
* Analysis of information. The information gained during the mission was analyzed to determine the extent to which the project achieved its objectives and how it was implemented and executed.

**Project Information.** The information (reports and documents) was directly obtained from the project executing agency and UNDP: Project Document (PRODOC), UNDP Project Implementation Reports (PIRs) for the years 2008 to 2012, and the project POAs from 2008 to 2012. Only one external audit report (for year 2010) was received. Reports were also received from the International Technical Advisor. The list of all information received is organized in Section6.6 and the digital version of this report contains all electronic files received.

After visits in Montevideo were completed, the evaluator proceeded to analyze the information received. The evaluator requested additional information both from UNDP and from the Project Coordinator, obtaining the last information digitally on April 9, 2013 for adjusting UTE co-financing costs for the draft version.

**Report Reviews.** The evaluator has delivered following report versions:

* March 30, 2013, Draft Version 1.0, in Spanish, for review of UNDP and DNE
* May 2013, Final Spanish Version 2.0, with uphold comments from DNE, UNDP and UNDP Regional Technical Advisor in Panama.
* June 2013, Translation to English of the Spanish Version 2.0.

# THE PROJECT AND ITS CONTEXT

The aim of this chapter is to present an overview of the project, considering the main issues raised in the PRODOC, reference document for this chapter.

## DESCRIPTION OF THE PROBLEM

This section is intended to describe the problems in electricity supply Uruguay was facing by 2006, the year in which the project was formulated, and the circumstances in which it was formulated[[13]](#footnote-14).

Uruguay is a country that lacked fossil fuels (both at the time of project formulation and at present), and depends for its power supply on electricity imports from hydropower through interconnections with other countries and imported fossil fuels. Since hydropower potential was practically exhausted, natural gas was expected to play an important role to meet growing electricity demand in upcoming years, estimated at the time at 3% annually. Gas plants were at that time the preferred alternative but had the following consequences: (i) increased dependence on imported energy for Uruguay, (ii) impact of gas price fluctuations in the international market on the national economy, and (iii) increased emissions of greenhouse gases (GHG).

Appropriate measures, energy efficiency and introduction of renewable energy sources were considered could play a valuable role in the national energy sector mainly through (i) substitution of future power plants based on fossil fuels to prevent associated GHG emissions, (ii) improving the conditions of interconnected power system operation, (iii) saving valuable water resources in periods of shortage, and (iv) the contribution to a more balanced energy mix to reduce dependence on imported energy sources.

Biomass and wind energy were considered as primary renewable energy sources with the greatest technical potential for Uruguay at the time of project formulation but it was necessary to develop legal and technical conditions that would enable interconnection and effective operation of decentralized generators.

While the newly elected government gave high priority to the use of domestic energy resources, including wind power and biomass, no specific action had been taken toward effective and sustainable introduction of renewable energy in Uruguay. There was no appropriate legal and regulatory framework for the integration of renewable energy into the electric power system, there were also no incentives to stimulate investments in these technologies and there was but little experience with private power generators and Power Purchase Agreements (PPA). As for wind power, updated information was lacking regarding economic and technical conditions for its integration into the national system.

The institutional framework was integrated by the MIEM which prepared and executed energy guidelines and policies through DNE. The centralized national electricity company UTE has the operational capacity over the electric power system, preparation and implementation of applicable policies, standards and codes. And finally, the Working Group for Renewable Energies (GTER) from the Engineering Faculty of the University of the Republic (UDELAR) provides knowledge about wind technology. As background experience with wind generation, there wasa150 kW Nordex wind turbine generator in the Sierra de Los Caracoles in operation since 2000[[14]](#footnote-15). This was installed by agreement between UTE and the Inter-American Development Bank (IDB).

Based on previous studies[[15]](#footnote-16), GTER estimated the technical potential of wind energy in the three mountain range regions to the east of the country (Sierra de Las Animas, Sierra de los Caracoles and Sierras de Las Cañas) between 400 MW and 600 MW. Good wind potential was also identified at the Laguna de Rocha, at Tacuarembó in the middle of the country, at Las Rosas and Punta Brava or Las Carretas (Montevideo). Positive evaluation of these areas included criteria related to the distance to the power grid network and access to sites.

As a sign of national interest in wind energy in 2003, UTE published a Call for Expression of Interest conducting a survey of foreign companies to access the wind market in Uruguay. UTE had previously conducted an economic analysis of wind projects integrated to the national grid. Later this interest was consolidated by the sub-secretary of MIEM who expressed the country's need for new energy technologies in a workshop organized by UTE the October 18, 2005. However, significant barriers were shown to hamper progress of renewable energy. New forms of contracting with private sector Independent Power Producers (IPP) started to be introduced in the country like the Power Purchase Agreements (PPAs), in a sector where UTE was the owner and operator of most power plants. This then would lead to a transformation in the power supply model with private sector participation in generation.

Given the needs of the electricity sector, the possibility of using wind power and the challenges that its usage entailed, the Government of Uruguay (GoU) requested UNDP the preparation of a technical assistance project for the formulation of Uruguay Wind Energy Programme (UWEP), to be submitted to the GEF for approval and funding[[16]](#footnote-17).

On the other hand, this problem was an opportunity to reduce emissions of greenhouse gases (GHG) as the electricity sector could have chosen to use generation plants using petroleum fuels. This reduction in emissions was in the interest of GEF and in line with the national environmental policy, even if Uruguay was in 2007 a modest GHG emitter (in 2008, emissions were 11.9 Mton CO2 for a population of 12.73 M in 2007, equivalent to0.94 ton CO2/person/year). Uruguay was also a nation eligible for GEF projects. In line with its environmental policy, Uruguay ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994 and the Kyoto Protocol in November 2000.

## Project Objective

The project objective aims to contribute to the elimination of existing barriers to the development of commercially viable wind energy investments in the country and the establishment of a 5 MW demonstration project for replication. The project will promote wind power generation, contributing to the sustainable development of the energy sector in Uruguay. The activities proposed in this project will remove barriers to the adoption of wind energy for electricity generation in Uruguay, including institutional, regulatory, financial, technological and social barriers.

The results associated with this project are:

1. The development of a policy and regulatory framework for wind energy in Uruguay.
2. The development of information to facilitate the development of wind energy projects.
3. Increasing the ability of companies to develop and implement wind energy technologies in the public and private sectors.
4. The elimination of technological barriers through the installation of measuring equipment and the installation of a 5 MW wind plant, connected to the network.

### Barriers Identified

The barriers identified in the PRODOC, after a thorough analysis, were classified into the following four categories:

* *Policies*
  + Insufficient and / or inappropriate transparent regulations to install and operate wind turbines connected to the grid, including network access and preferential dispatch.
  + Lack of an enabling policy framework that allows third parties to embark on wind energy investments, for example under PPAs with the national company UTE.
  + Underdevelopment of technical standards, building codes and electricity, and environmental guidelines for wind energy systems.
  + Unattractive low return on wind projects investment selling electricity to the grid and as a result, lack of interest among investors and developers to invest in wind energy.
  + Lack of long-term financial incentives to be paid for wind generated electricity, based on an evaluation of the benefits to the economy and national society.
* *Capacity and business models*
  + Insufficient capacity and skills between public sector actors (DNE and UTE) and private sector to implement wind energy investments in Uruguay.
  + Lack of a mandate within UTE to promote and deploy wind energy systems.
  + Limited understanding on implementation and operation of wind technology in Uruguay
* *Information*
  + Insufficient detailed information related to the wind potential in Uruguay.
  + Lack of incoming information to develop a first group of commercial wind farms.
* *Technology*
  + Lack of financial resources and technical equipment to gather data on winds and make them available to parties interested in future investments.
  + Absence of successful large-scale wind energy projects in Uruguay.

The project strategy designed products to remove each one of the barrier categories.

While the barriers aforementioned prevented the development of wind energy in Uruguay, it is worth noting that two basic conditions had already been fulfilled to allow UWEP to remove the barriers identified in Uruguay:

* 1. The recognition by the Government of Uruguay, represented by MIEM and UTE, to review the cost of wind energy reference, implying extension of the mandate for the latter.
  2. The political will by the GoU to accept and facilitate the entry of private generators in the electricity sector.

These conditions involved a breakthrough for the introduction of decentralized renewable energy sources (including wind power) in the national electricity system and were a breeding ground for the development of UWEP.

The expected situation at the end of the project regarding barriers was that by removing those through project execution would cause a nationwide effect for wind power penetration, using a renewable energy resource and reducing emissions allowing of greenhouse gases.

### PRODOC Formulation

The Project Document (PRODOC) was developed based on the results of the PDF[[17]](#footnote-18). Its final version of June 19, 2007 includes implementation of a Medium-Sized project with four components, to develop in three years. The project components are designed for the removal of the identified barriers.

### Approval of the Project by the GEF

The Project Proposal was approved by GEF on May 1, 2007. Following UNDP-GEF procedures, the PRODOC was signed by the parties, the Ministry of Industry, Energy and Mining (MIEM), Office of Planning and Budget, and UNDP on June 30, 2007.

### Project Finance

The initial value of the project is US$6,960,000, with a GEF contribution of US $ 950,000 (13.6%), UNDP US $ 35,000 (0.5%), and co-financing from the Government of Uruguay for US $ 5,975,000 (85.8%), of which US $ 225,000 (3.2%) are in kind by the DNE and $ 5,750,000 (82.6%) as a contribution to the development of the wind farm by UTE.

## STARTING DATE AND DURATION OF THE PROJECT

The project start date was July 1, 2007, with an initial term of three years (until June 30, 2010). The execution time limit has been extended several times due to different factors: delays in the recruitment of staff at the beginning of the project, the first transfer of funds (occurred on January 25, 2008), and several reviews of the project including budget and activities adjustments from one year to the next, without any budget change by GEF (US $ 950,000) and UNDP (US $ 35,000), with an addition of MIEM in June, 2012 of $ 15,000.

The time extensions totaled three years. This project therefore was executed at double the initial term. The project on January 2013 was in the Final Term Evaluation stage, thus complying with this requirement of the GEF. Table2‑1 shows the major milestones of the program.

Table 2‑1.ProgramMainEvents



Source: Evaluator`s own compilation

## PROJECT GOAL AND OBJECTIVE

The Global Environmental Goal (project objective) is to reduce emissions of GHGs through the implementation of large-scale wind power connected to the grid in Uruguay. Directly avoided emissions are 0.18 Mt of CO2 in the life cycle (20 years) of a 5 MW wind power plant. Indirectly avoided emissions are 1.1 Mt of CO2 in the period 2006-2015, with annual savings after 2015 of 0.26 Mt CO2 minimum.

The *project development goal* is the removal of these barriers to the development of commercially viable wind power investments in the country, and the installation of a 5 MW demonstration wind farm as the basis for replication in the country.

## PROJECT outcomes andoutputs

To remove identified barriers thoroughly analyzed in the PRODOC, four outcomes were designed:

1. An enabling policy framework has been created, including regulations for access and dispatch to the network, for construction and operation of wind farms, technical codes and financial incentives for wind generated electricity
2. Information has been produced and made available to prepare and facilitate identified wind power projects, as well as information and promotion for stakeholders and the general public
3. Increased business skills have been developed to prepare and implement wind energy technology within the public and private delivery model.
4. Technological barriers have been eliminated through the provision of measuring equipment and the implementation of the first 5-MW wind power plant connected to the grid

Each component has its expected outputs, proposed activities and budget for its execution thus**[[18]](#footnote-19)**:

* **Outcome # 1.An enabling policy framework has been created, including regulations for grid access and dispatch, construction and operation of wind farms, technical codes, and financial incentives for wind-generated electricity.**

Four outputs are expected for this outcome:

* Implementation of amendments to regulations and procedures for enabling wind energy systems to be connected to the grid.
* Implementation of technical standards for wind energy applications in Uruguay.
* Evaluation of the cost of wind energy connected to the national electricity system and the proposal of an incentive mechanism.
* Streamlining of procedures to support project development in relation to spatial and environmental planning, including supportive studies.

The total amount budgeted for this outcome is US $ 120,000 [GEF: US $ 98,000, GoU: US $ 22,000 (in kind)]. This outcome represents 1.72% of the total project budget.

* **Outcome # 2: Information has been produced and made available to prepare and facilitate identified wind energy projects, as well as information and promotion for stakeholders and the broader public**

Four outputs are expected for this outcome:

* + Implementation of a wind measuring Programme to assess the wind potential in Uruguay, including the creation of a wind atlas.
  + Execution and publication of feasibility studies for UTE's proposed first 5 MW wind farm and for two (2) more early-investment wind energy projects
  + Creation of knowledge and awareness on the opportunities of wind energy among relevant stakeholders and the society as a whole
  + Execution of a UNDP/GEF monitoring and evaluation component.

The total amount budgeted for this result is US $ 289,000 [GEF: US $ 229,000; GoU: US $ 60,000 (in kind)]. This outcome represents 4.15% of the total project budget.

* **Outcome # 3.Increased business skills have been developed to prepare, implement and benefit from wind energy technology within the public and private delivery model.**

Three outputs are expected for this component:

* Enabling of the public delivery model by strengthening the skills within DNE and UTE for wind energy development.
* Preparation of the private delivery model by creating capacity among identified private actors
* Capacity building among local companies interested in entering the wind energy market.

The total amount budgeted for this outcome is US $ 223,000 [GEF: US $ 193,000; GoU: US$ 30,000 (in kind)]. This outcome represents 3.2% of the total project budget.

* **Outcome # 4: Technological barriers have been removed by facilitating measuring equipment and implementing a first 5-MW wind farm connected to the grid**

Two outputs are expected for this outcome:

* + The procurement and installation of wind measuring equipment and a data management system for consultation and data analysis.
  + Investment in a 5 MW wind farm (externally funded).

The total amount budgeted for this outcome is US $ 5,990,000 [GEF: US $ 240,000; GoU: US $ 5,750,0000 (cash)]. This represents 86.1% of the total project budget and is therefore from the costs perspective, the major component.

## projectIndicators, monitoring and evaluation

The PRODOC logical framework matrix established for the project objective and for each of the four outcomes performance indicators with their respective sources of verification and under the assumptions associated[[19]](#footnote-20). These indicators and sources of verification are the basis of the monitoring and evaluation, and have been used in the course of project implementation by both UNDP and DNE as the final term evaluator.

## implementation and execution of PROJECT

The project implementation method is National Execution (NEX) (executed by a government agency). This method is advantageous because it enhances technical and management skills of the executing agency, and strengthens its overall profile in terms of leadership and promotion, which impacts on project sustainability and helps to create the conditions for future replication.

The agencies directly involved in the project are the executing and implementing agencies. Their roles and responsibilities are as follows.

### Implementing Agency: UNDP Uruguay

The Project implementing agency is UNDP Uruguay. UNDP is responsible to the GEF Council as GEF Implementing Agency in charge of financial management and for delivering the project expected outcomes.

The project would be managed in accordance with administrative regulations and procedures established by UNDP. UNDP would have the following functions:

* Manage and distribute program funds on behalf of the GEF Secretariat,
* Provide assistance in the procurement of equipment, if required, and ensure that the process of selection of both national and international consultants and subcontracting, will be carried out following competitive and transparent processes,
* Provide assistance with GEF formal procedures regarding reporting
* Act as the formal channel through which correspondence is handled between UNDP-GEF and the project, and
* Be responsible for the ongoing monitoring of program progress.

Also:

* Appoint a Programme Officer as focal point for this program,
* Administrative support and financial and budgetary monitoring of the implementation of the program,
* Provide accounting, financial and budget documents for the project,
* Conduct annual audit of the program following the procedures of the GEF,
* Charge a fee for the provision of services in accordance with the UNDP Corporate Guidelines on Cost Recovery (Medium-High Cost Level on the Universal Price List).

### Executing Agency: DNE

The project executing agency is the DNE[[20]](#footnote-21) (NEX execution). It will be responsible for overall project development and day to day implementation. The DNE will assign the project to a task force within its organization, which will be in charge of the project and of executing some project activities. The DNE will also provide the Project Leader who will be responsible for maintaining the project in its right track and developing specific initiatives keeping with the project objectives[[21]](#footnote-22).

### Project Steering Committee

The project will create a Project Steering Committee (PSC) formed by the PMU, the Project Leader and Technical Assistant, the UNDP Programme Officer of the country in charge of the project, and the UNDP/GEF representative. The PSC will meet quarterly with the task of reviewing the Project progress and problems, and making decisions on strategic or critical matters. The PSC is the highest authority with decision-making power in the UWEP initiative. The quarterly meetings are convened by the Project Coordinator and special meetings will be held if deemed necessary by one of the members of the PSC. In these meetings of the PSC, the project progress for the respective period will be presented and analyzed; its members will receive in advance the documentation relating to project execution, outcomes, fulfillment of objectives, etc.

### Project Coordination Committee

The project will also create a Project Coordination Committee (PCC) formed by the PSC and complemented by other relevant parties involved. Some of the stakeholders identified are UTE, Ministry of Industry, Energy and Mining (MIEM), Chamber of Industries of Uruguay (CIU) and the National Environment Directorate (DINAMA) and the Climate Change Unit. Other stakeholders may be identified before or during of the Project insertion Workshop. In particular, it may be beneficial to invite local government authorities and civil society organizations in the regions where the first wind farms are being planned.

For project implementation the following units were established and the following staff required.

### Project Management Unit

The project will establish a Project Management Unit (PMU) with a Project Coordinator and Administration / Secretariat Joint Unit[[22]](#footnote-23). The PMU will be located in the DNE. The Project Coordinator will be responsible of the day-to-day operations, defining GEF financial contributions according to quarterly plans and budget, and financial bookkeeping. The project coordinator will also be in charge of supervising specific project activities, and convene meetings between the DNE and UNDP.

### Project Coordinator

The executive director of the PMU would be the Project Coordinator (PC) and is to give strategic direction to the PMU and assume ultimate responsibility for the planning and quality of all project results. The PC would have the ultimate responsibility to advise and provide all necessary information on progress of UWEP to the PCC and PMU members. The PC must:

* Formulate and present works and financial plans to the PCC,
* Monitor work progress,
* Coordinate with various departments and agencies timely delivery of inputs from government,
* Provide guidance to the team of national and international project consultants,
* Coordinate with UNDP revision of reports and ensure compliance of administrative processes under UNDP procedures.

### Other PMU Staff

Other PMU staff includes

* **The Planning and Monitoring Specialist i**s responsible for guiding the entire M&E strategy and implementation of related activities within the project and vis-à-vis partners, in addition to providing relevant and timely information to the project manager and the parties involved in the project.
* **The Project Assistant** will be responsible for administrative and financial activities of the project and for the monitoring and disbursement of funds ensuring that UNDP rules and procedures are followed.

Other project activities will be (sub) contracted in compliance with DNE and UNDP / GEF standards and any other applicable law in Uruguay.

## Monitoring and evaluation

The project will be monitored and evaluated according to UNDP rules for such projects implemented through National execution. Monitoring is intended to track the project performance, provide external support and carry out the project final performance and impact evaluation considering planned objectives.

The PMU will develop criteria for participative monitoring of project activities in consultation with the Project Steering Committee (PSC). The Monitoring and Evaluation activities will be based on the Logical Framework Matrix (Annex IB of the PRODOC). The monitoring and evaluation general format will follow UNDP-GEF M&E Unit guidelines and instructions and the details will be provided through the Inception Workshop (to be held within the first two months after the start-up of the project).

The PMU will develop and provide key monitoring and evaluation documentation. It shall also provide updated project financial and progress data. This documentation is subject to review, adjustment, approval and implementation at regular meetings between DNE and UNDP.

The PMU will develop a detailed schedule of project reviews agreed at the start of the project with project implementation partners and integrated to the Inception Report. The agenda will include methodologies and estimated time frames for Tripartite Reviews, Steering Committee Meetings, evaluation and monitoring meetings, and agreement on indicators to be used.

The UNDP / GEF project will require independent Medium Term and Final Term evaluations. Medium Term Evaluation will be executed 18 -22 months after start-up of project activities and will include a review of project progress, including a review of the logical framework and whether the activities and indicators chosen are appropriate.

The project will be subject to UNDP / GEF Monitoring and Evaluation regulations, including the preparation of the Annual Project Implementation Review (PIR) / Annual Project Report (APR), and the Management Framework Based on Results for monitoring and evaluation purposes.

## Project Schedule

The project schedule was drawn up for a period of three years. The following figure shows quarterly planning (Figure 2‑1)..

## FINANCING

Table 2‑2 shows that the total project budget amounts to US $ 6.960.000, not including PDF-B for which the cost was US $ 55.800 (GEF: US $ 50,000; MIEM: US $ 5.800)[[23]](#footnote-24). As can be seen, a *key determinant of project success would be cash contributions from the Government of Uruguay for US $ 5,750,000.*

Table 2‑2. Project Costs in 2007 US$



Source: UNDP-GEF - PRODOC, p. 64.

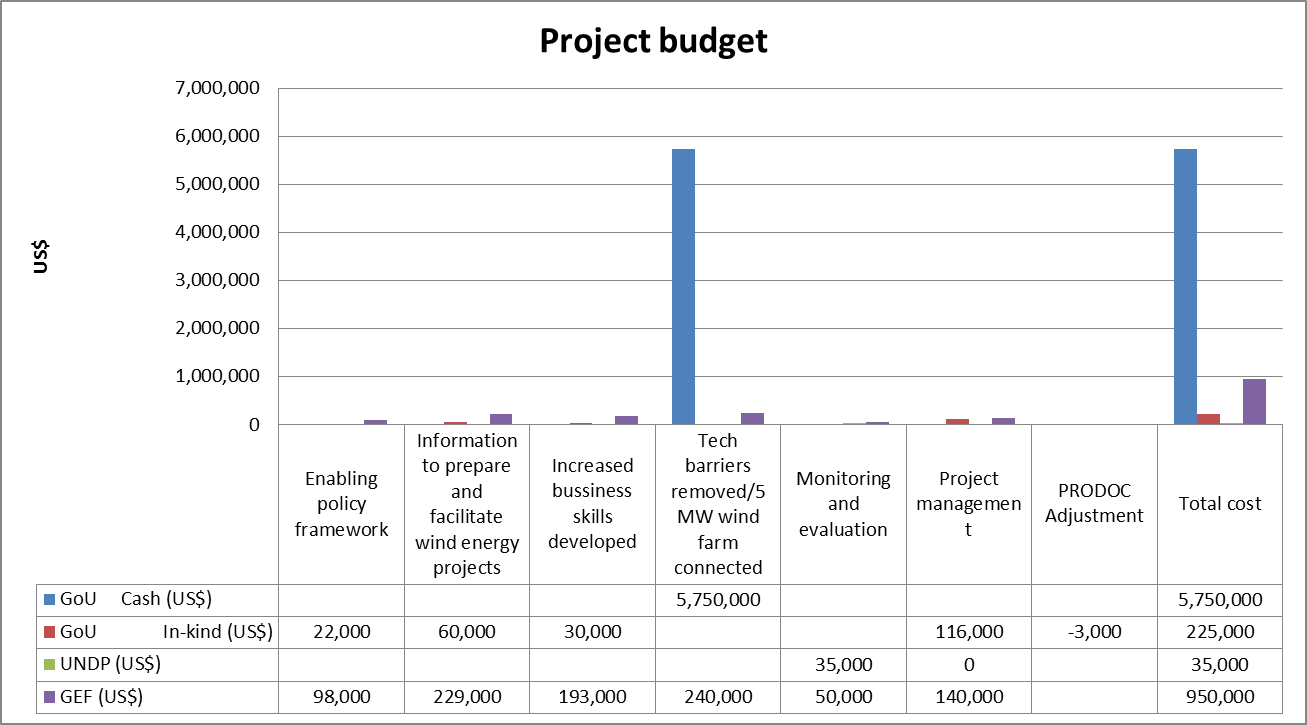
Figure 2‑2 shows the breakdown of the budget by component and source of funding. In this budget, the largest funder is the GoU (85.84%), GEF with 13.65% and UNDP with 0.50%) (Figure 2‑3).

Most of the resources were allocated to the development of the 5 MW demonstration wind power plant for a value of US $ 5,750,000 (an investment cost of US $ 1,150 / kW) (Component 4, 86.03%) (Figure 2‑4).

Figure 2‑1. Project schedule.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * 1. *DURATION OF THE PROJECT IS 3 YEARS* | | | | | | | | | | | | | | | |
| **ACTIVITIES** | **PROJECT QUARTERS** | | | | | | | | | | | | | | |
| **Project components** | I | II | III | IV | V | VI | | VII | | VIII | | IX | X | XI | XII |
| ***Outcome #1*** |  | | | | | | | | | | | | | | |
| Amendments regulatory framework |  |  |  |  |  |  | |  | |  | |  |  |  |  |
| Review of standards |  |  |  |  |  |  | |  | |  | |  |  |  |  |
| Evaluation cost of wind energy |  |  |  |  |  |  | |  | |  | |  |  |  |  |
| Streamlining procedures and supportive studies |  |  |  |  |  |  | |  | |  | |  |  |  |  |
| ***Outcome #2*** |  | | | | | | | | | | | | | | |
| Implementation wind measuring programme and creation of wind atlas and micro-sitting |  |  |  |  |  |  | |  | |  | |  |  |  |  |
| Execution and publication of 3 feasibility studies |  |  |  |  |  |  | |  | |  | |  |  |  |  |
| Creation of knowledge and awareness |  |  |  |  |  |  | |  | |  | |  |  |  |  |
| Monitoring and evaluation |  |  |  |  |  |  | |  | |  | |  |  |  |  |
| ***Outcome #3*** |  | | | | | | | | | | | | | | |
| Enabling public delivery model |  |  |  |  |  | |  | |  |  |  | |  |  |  |
| Preparation of the private delivery model |  |  |  |  |  | |  | |  |  |  | |  |  |  |
| Capacity building local companies |  |  |  |  |  | |  | |  |  |  | |  |  |  |
| ***Outcome #4*** |  | | | | | | | | | | | | | | |
| Procurement and installation wind measuring system |  |  |  |  |  | |  | |  |  |  | |  |  |  |
| Investment and construction of 5 MW wind farm |  |  |  |  |  | |  | |  |  |  | |  |  |  |

Figure 2‑2. Budget by activity and source of funding (2007)



Source: information from UNDP-GEF PRODOC page 64

Figure 2‑3.Project Budget (2007)

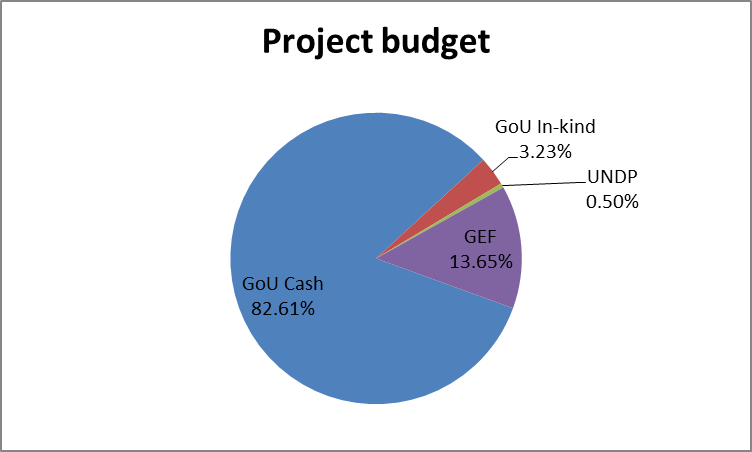
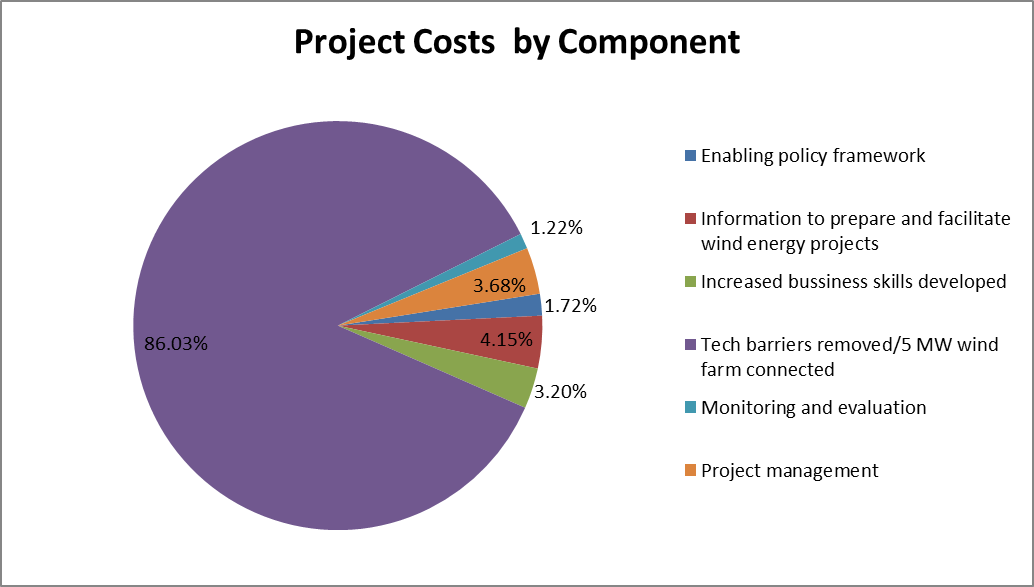


Figure 2‑4. Participation of project activities in the budget (2007)



## SUSTAINABILITY

UWEP proposed initiative seeks to create an enabling environment for investment in wind energy developments and strengthen the technical and operational expertise. Therefore, one of the pillars for project sustainability is cooperation with key institutions in the energy planning (DNE), research (GTER of UDELAR), and generation and distribution of electricity (UTE).

UWEP will assist DNE in leading the process of wind energy planning, project identification and facilitation of public and private wind farms developers. Since UWEP is within DNE, it is anticipated that its activities will gradually be absorbed by DNE so that, once the project ends, DNE automatically continues key activities, ensuring continuity UWEP actions.

UWEP, by assisting UTE during the preparation and implementation of a first publicly funded wind farm, will improve and institutionalize directly specific technical, financial and managerial expertise in wind technology. UTE staff will play a key role in understanding the benefits of wind power connected to the national grid and will be the interface for communication with private sector project developers.

An important aspect of sustainability is the UWEP exit strategy. It was discussed and agreed with DNE that the staff recruited shall be maintained under contract after completion of UWEP in order to continue the development of wind farms. UWEP staff has become wind energy experts within the public sector, and will share their expertise with others through their professional activities. This ensures the sustainability of outcome # 3.

The sustainability of effective use of wind measurement systems delivered cannot be guaranteed by UWEP design. As a result of the use of such equipment, at the end of the project the following items can be checked: (i) the wind atlas of Uruguay, (ii) detailed wind information in a number of promising sites (at least three "micrositing" analyses), and (iii) the continued provision of information from the computerized monitoring wind system (probably managed by DNE and UTE). At the end of the project it is unlikely that the monitoring system be abandoned because operating costs are low and there will be trained personnel available then. Therefore, the sustainability of the monitoring system (Outcome # 4) is very likely.

A third component of the wind measurement system provided is the measuring towers and "micro-siting" equipment. After the project is completed, the system represents a UNDP capital asset (used by DNE); there must be a fair and transparent transfer of this equipment to the end user after the completion of UWEP.

Financial sustainability is taken as a given accomplishment because the economic convenience of the projects will summon other developers to get involved in new projects. But by the end of the project such financial prospect should be improved by: 1) increased financial return on wind farms investment assessing the price paid for wind-generated electricity sold to the national grid, 2) attracting private capital and companies to develop, build and operate wind farms that can sell both to the national grid and directly to final consumers, 3) an assessment of the economic value of wind energy as an asset to technological and economic development, which will provide a rationale for continuous national support for investments in renewable energy.

## Project Risks

Two risks categories that may affect execution and outcomes of the project were considered in the PRODOC formulation. The first are direct risks that may affect project execution adversely. These risks would be related to the positions taken by the parties and the project executor`s ability to carry it out successfully. None of these risks were identified.

The greatest indirect risk was related to the inability to procure and effectively build the 5 MW wind power plant planned. UTE and MIEM, however, have confirmed public funding schemes for the plant and there are serious commitments from these actors that minimize this risk.

Another risk of the project would be the inability to identify and prepare three viable wind power projects (one to be built, and two more to be detailed in the feasibility study). This risk seems small because several areas have been identified with good wind potential, located in the south of the country where access to streets and grid connections are relatively close.

## Replicability

UWEP Project replicability might be jeopardized if no new projects are developed once the first one has been completed. The causes could be:

* Technical wind energy potential lower than expected;
* Commercial potential for wind energy lower than imagined.

The first cause is very unlikely since preliminary studies have estimated wind potential of at least 400 MW, which is considered conservative due to the topographic features of the country.

The second cause is related to the inability in Uruguay to pay a viable price for wind electricity in the long term. This would reduce or inhibit the commercially exploitable wind potential in the country, which has been estimated at a minimum of 150 MW until 2015. The risk is addressed through: (i) project activities that aim to reduce the implementation costs of wind projects and implement viable wind projects carefully designed, (ii) assessing the real value of wind power within the Uruguayan context, conducing to reach a sustainable price, (iii) the anticipated long-term inclusion of domestic renewable energy resources in the national policy to diversify the energy supply mix and reduce its dependence on fossil fuels, and (iv) exploration of niche markets.

# FINDINGS AND CONCLUSIONS

This chapter aims to present findings and conclusions on project development, implementation and outcomes, to give an overall assessment.

Table 3‑1 below shows the summary of project performance evaluation ratings for monitoring and evaluation, for performance of implementing and executing agencies, and evaluation of results and sustainability.

^^

Table 3‑1.Ratings of project performance evaluations

|  |  |  |  |
| --- | --- | --- | --- |
| **1. Monitoring and evaluation** | **Rating** | **Two. Executing Agency Implementing Agency and** | **Rating** |
| Monitoring design and evaluation at the beginning | **S** | UNDP Implementation quality. | **S** |
| Implementation of Monitoring and Evaluation Plan | **S** | Quality of execution - Executing Agency | **S** |
| General Quality of Monitoring and Evaluation | **S** | Overall quality of the implementation / execution | **S** |
| **3. Evaluation of results** | **Rating** | **4. Sustainability** | **Rating** |
| Relevance | **HS** | Financial Resources | **P** |
| Effectiveness | **HS** | Socio-political | **P** |
| Efficiency | **HS** | Institutional framework and governance | **P** |
| Overall rating of project outcomes. | **S - HS** | Environment | **P** |
| **Rating of outcomes**  Global Environmental Outcome  Outcome 1  Outcome 2  Outcome 3  Outcome 4 | **HS**  **S**  **HS**  **S**  **HS** | In general, the likelihood of sustainability | **P** |

\* Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U) and Highly Unsatisfactory (AI). For sustainability: Probable (P), Moderately Probable (MP), Moderately Unlikely (MU), Unlikely (U).

The whole project can be considered as ***Satisfactory (S) to Highly Satisfactory (HS),*** with 2 Satisfactory outcomes and 3 Highly Satisfactory outcomes

The following sections are the considerations that led to the above project ratings.

## PROJECT FORMULATION

This section aims to describe and evaluate[[24]](#footnote-25) how efficiently the project concept and design were able to address the problem, with emphasis on the consistency, strategic logic and logical framework for the project.

### Project Concept / Design

The *project is consistent* with objectives of GEF Operational Program # 6: Remove the barriers to the introduction of large-scale Renewable Technologies connected to the grid network (specifically wind energy) in Uruguay, and create a basis for replication and sustainability. It also fits perfectly under GEF Strategic Objective CC-4 which is to promote grid-connected electricity from renewable sources. The project is also in line with Uruguay´s environmental policy.

For Uruguay´s future energy supply, the possibility of using local resources such as wind and biomass, was clearly understood by the Government of Uruguay and *the consensus achieved between the political parties* that succeeded in establishing a long-term national policy is a fundamental factor for the process of introduction of renewable energy in the country, in particular wind power. Therefore, the execution of UWEP started with an initial legal basis and legal framework that allowed UWEP to develop activities towards the achievement of its outcomes and act as a promoter of project initiatives and catalyst for activities of different stakeholders involved in the development of wind energy in the country.

These national policies and commitments on a path toward the use of the country´s local renewable resources, the increase of renewable energy within the energy mix of the country, reducing dependency on the use of petroleum fuels and sustainable development, are conceptually well connected within the characterization of the project.

The project developed is aimed at removing the barriers identified. *The barriers were well identified and the proposed mechanisms to remove them, appropriate.* Therefore, the global environmental objective, the development objectives of the project and their respective outcomes formulated in the logical framework are consistent with the barriers to be removed. Moreover, the project objectives and outcomes are also in line with Uruguay´s government initiatives to ensure reliable and sustainable supply of electricity for the country.

The *implementation strategy* of the project is considered successful since the participation of the DNE in conjunction with UDELAR and UTE through the Project Steering Committee (PSC), was the appropriate institutional framework for development, harnessing knowledge components by UDELAR, DNE´s leadership and incidence on the country's energy policy, and development capabilities and resources as well as UTE´s ability to summon investors through joint venture calls.

The socio-cultural, political, regulatory, institutional and economic environment of project became apparent in the analysis of *risk factors* identified by the project.

**Project Risks**

Direct risk factors of the project were linked to the positions taken by the parties involved in executing the project and the project executor's ability to carry it out successfully. These risks were considered low and the project confirms that this assumption was right since UWEP was welcomed by the executor, DNE and supported by UTE and UDELAR, two of the institutions engaged with more commitment in the execution. On the other hand, in interviews with different stakeholders (consultants, service providers, guilds like AUdEE), the evaluator confirmed the summoning power UWEP had acting as a catalyst for initiatives and facilitator for the establishment of the AUdEE, an organization that promotes the development of wind energy in the country.

The project considered the inability to effectively build the 5 MW demonstration wind farm planned as the greatest indirect risk. UTE and MIEM had confirmed public financing plans for the wind farm planned. UTE developed two wind farms with a total capacity of 20 MW, four times larger than the 5 MW anticipated in the PRODOC.

Another risk of the project would be the inability to identify and prepare three viable wind power projects (one to be built, and two more to be detailed in the feasibility study). This risk was correctly identified as small, because they identified several areas with good wind potential located in the south of the country where access to routes and network connections are relatively close. Indeed UWEP participated in two UTE parks (out of the three proposed) and currently there are former UWEP officials giving continuity to the work and developing two UTE wind farms parks: 67 MW in Artigas and70 MW in Cologne, a joint project with Eletrobras.

Project components and activities proposed to achieve the objectives are appropriate and respond to the institutional, legal and regulatory issues of the project. The schedules resulting from activities planning and their interrelation can hardly anticipate delays that can occur but that are why project implementation must be flexible and adapt to these situations for the sake of project implementation. This situation has been identified in the AOP from 2008 to 2012, and the project did not alter the barrier removal strategy and expected outcomes. In addition, all modifications to the operating level were manifested in the AOPs and subject to approval by the UNDP-GEF, as established in the PRODOC.

The schedule proposed in the PRODOC foresaw no deficiency or delay in its execution. It is considered that the initial schedule of activities for three years was too short to implement the project and that the runtime should have been greater. The execution time has turned to be 6 years (double the initial estimate) but has also been a consequence of the rapid development of wind energy in Uruguay, supported substantively by UWEP. Fortunately the project development was accompanied by time extensions to the present.

Indicators were defined for the Project Development Objective and in each of the expected outcomes for the four components. Indicators are useful to guide project implementation and measure progress, but there is need to comment on several indicators namely[[25]](#footnote-26):

* **Outcome 1.1.**An enabling policy framework has been created, including regulations for grid access and dispatch, construction and operation of wind farms, technical codes, and financial incentives for wind-generated electricity.

**Description of the Indicator.** Amendments to the policy framework and existing technical regulations, enabling public and private delivery model, measured in five steps: (i) full enabling environment for public delivery model (30%); (ii) implementation of the first 5 MW wind farm (10%); (iii) full enabling environment for private delivery model (30%); (iv) publication of all tendering calls for a second wind farm (20%); and (v) enablement of private company to invest and operate with wind capacity (10%).

**Comment:** The goal for a project to make amendments to the policy framework is desirable but is often outside the scope of a project. As an indicator, it is more realistic to propose amendments than to achieve them. This was not the case in this project due to the very favorable conditions under which UWEP was developed.

Therefore, the evaluator conceptualizes that project formulation is ***Highly Satisfactory (HS)***

### Relevance of the project for the country / Country ownership

Establishing a long-term energy policy with an integrated and multidimensional view, including technical, economic, geopolitical, environmental, ethical and social factors is a substantive achievement of the political leadership of the country without precedent in the history of Uruguay and the region. From initial policy definitions elaborated in 2005, the energy policy was brought to the Council of Ministers in 2008 and then established as a consensus among all political parties in 2010.

One of the backbones of the policy is the introduction of renewable energy (solar, wind and biomass) and energy conservation, so UWEP with its various components was an appropriate project to catalyze and contribute to wind energy development. *UWEP therefore is considered appropriate and relevant to the country.*

Besides the high project relevance for the country, the project has not only achieved the gains that are discussed below, but has managed to position wind power in the Ministry of Industry, Energy and Mining and other areas such as DINAMA, the UTE public company, municipal governments, associations as AUdEE, project developers, and society in general, in short, in all sectors and among all different actors, as a valid and sustainable option for the electricity supply of the country. This situation has been attested by the evaluator through interviews with different stakeholders involved in UWEP. In addition, project stakeholders have appropriated in different degrees knowledge on wind technology, the legal, regulatory, policy and environmental framework that have allowed the current development and implementation of future developments[[26]](#footnote-27).

Therefore, outputs and outcomes defined in the project coincided with national and local priorities, the latter associated with the use of wind energy at the level of micro-generation for the rural sector. The project also helped to resolve needs of the main beneficiary, DNE and UTE, to strengthen capacity development in units related to wind energy, promote the development of technical studies to support decision making, disseminating information and knowledge about wind energy, promoting the interaction between stakeholders and the creation of the AUdEE, among others.

The strategy that propelled the project to achieve outcomes succeeded as it was agreed during the project formulation mainly with DNE and UTE, and therefore has had the acceptance of the beneficiary institutions.

### Stakeholder participation in the project conceptualization / design

The project design was preceded by an initial formulation of the project proposal by the GTER of UDELAR. Subsequently, the project was taken up by UNDP and DNE leading to UWEP. During the formulation of the PDF the main stakeholders were UNDP as implementer, DNE as executor, and UTE and GTER of UDELAR as co-executors. The latter two institutions are central to the implementation of UWEP. Expert meetings were also carried out with the National Administration of Fuels, Alcohol and Portland (ANCAP), municipal governments, research institutions (such as INIA), the private sector, ministries and Policy Units like the National Environmental Directorate (DINAMA) and Energy and Water Regulation Unit (URSEA) among others.

As result of the information analyzed and the interviews conducted by the evaluator, interaction with relevant stakeholders is considered at the highest level in the discussion of the objectives of the project, its scope and the roles of these institutions in the project, a clear demonstration of the ability of the DNE and UNDP to propose actions at the highest level.

*In conclusion, there was good participation of different stakeholders in the conceptualization and design of the project led by the DNE and UNDP, due to the deep knowledge of the energy sector by the DNE and the summoning power of UNDP around a problem of national interest, which is in line with the Government of Uruguay policies on energy and environment.*

### Tracking, Monitoring and Project Management

As a result of dialogue and interviews with different stakeholders of the project, the evaluation found UNDP actively involved in facilitating the efforts of the project.

Active project monitoring and follow-up was also attested and resulted in the excellent ratings given to the project in the PIRs that serve to identify project stakeholders’ deficiencies in project implementation and establish appropriate corrective measures.

### Other issues

For the implementation of GEF projects, UNDP has the advantage, over other institutions, of its enormous summoning power vis-à-vis the State sector and the unions, and society in general. On the other hand, it handles social and governmental lines of work in line with the GoU. Also, their recognized impartiality is favorable for action with multiple actors.

## IMPLEMENTATION OF THE PROJECT

### Implementation approach

The implementation approach is simple and transparent. The DNE as Executing Agency was responsible for the overall project development and the day to day work. UNDP is responsible to the GEF Council as the GEF Implementing Agency in charge of financial management and for obtaining the desired outcomes for the project.

The DNE assigned the project to a task force within the DNE with partial responsibility for the activities of the project and provided the Project Leader, responsible for maintaining project in course and developing specific initiatives that are aligned with the objectives of the project.

The project established a Project Management Unit (PMU) with a Project Coordinator and Administration Unit/Secretariat, located in the DNE. A Project Steering Committee (PSC) was also constituted composed by the MIEM (through the Director of Energy or his delegate), UTE, and UNDP, and the participation of the Project Coordinator. The functions of all the organs of the project and of the positions have been given in Section 2.7.

The logical framework is presented as an integral part of the PRODOC and remained as the guideline of the project. The Work Plan that guided the implementation was presented at the PRODOC. This Plan was prepared and adjusted periodically to respond to the project in an agile and adaptive way. The work plans for implementation were processed according to UNDP administrative procedures to approve the resources that would be executed each year.

Overall bilateral communication channels between parties were satisfactory, and no evidence to the contrary was found.

The ToR of the personnel required for the project was set out in the PRODOC. Various consultants and consulting firms were hired to run the project. In relation to the work of the consultants and consulting firms contracted, the evaluator found that the deliverables met satisfactorily the needs of the project. According to UNDP rules only one external audit was required, as indeed it was carried out in 2010 with satisfactory results (See3.2.2.3).

The PRODOC contains a logical framework consistent and coherent with the general and specific outcomes of the project, and the indicators are sufficient in number and specificity for monitoring, follow-up and evaluation.

Project execution went on without institutional difficulties or difficulties between the consultants and UWEP coordination, as it was evident to the evaluator in the interviews with a group of consultants who worked on the project (See 6.4, Interview No. 8).

The evaluator considers that the implementation approach is ***Highly Satisfactory (HS***).

### Monitoring and evaluation

#### Monitoring

The PRODOC established following Monitoring and Evaluation (M&E) mechanisms for the project[[27]](#footnote-28):

1. The M&E would follow the UNDP monitoring and evaluation procedures in the ATLAS System for projects executed nationally (NEX).Both UNDP and DNE would be jointly responsible for the continuous monitoring of the program progress.
2. The PMU will develop a detailed agenda of reviews, in consultation with project implementation partners during the initial stages of the initiation of the project and will be incorporated in the Project Inception Report. This agenda will include methodologies and tentative time frames for Tripartite Reviews, Steering Committee Meetings, M&E of the project, and agreements on the indicators to be used.
3. The PMU will develop and provide key documentation for M&E. The PMU is responsible for updating, and continually reporting financial and progress information. Documentation shall be subject to approval, possible adjustments and subsequent implementation at regular meetings between DNE and UNDP. At these meetings, any problems that occur in the implementation will be addressed and resolved.
4. The PMU will develop criteria for participatory monitoring of project activities in consultation with the Project Steering Committee (PSC).
5. The project will be subject to the UNDP/ GEF M&E rules and practices, including the preparation of the Annual Project Implementation Review (PIR) / Annual Project Report (APR) and the Results Based Management Framework with M&E purposes.
6. The Logical Framework Matrix would be the guide for evaluating project performance and contains impact indicators with their means of verification.
7. UNDP Uruguay would monitor performance during execution.
8. There will be a Mid Term Evaluation performed between 18 -22 months after initiation of project activities and will include a review of project progress, including a review of the logical framework and whether the activities and indicators chosen are appropriate.
9. A Final Evaluation of the Project will also be undertaken.

Table 3‑2 shows the project M & E related documentation received from 2007 to December 2012. After reviewing this information, the evaluator was able to infer the following compliance of monitoring mechanisms:

* They have employed monitoring mechanisms established by UNDP using ATLAS.
* The DNE as executing agency has dealt with the daily work using the AOP and Annual Work Plans (AWP).
* More specifically and relating to monitoring mechanisms, in this project all PIR / APR were developed (PIR:UNDP Project Implementation Reports and APR: UNDP Annual Project Report) from the first for the period of July 2007 to June 30, 2008 until the last for the period of July 2011 to June 30, 2012 (See Table 3‑2)
* Assessment of progress towards development objectives (DO) for the project was always HS. The concept of the GEF Operational Point in Uruguay was missing for several years and the concept of UNDP GEF Regional Advisory is missing for the period 2001-2012 (See Table 3‑3). Thus, on average each year the project was evaluated as HS.

Progress assessment towards project implementation (PI) was assessed between HS and S for the periods between 2008 and 2012 (See Table 3‑3). It is worth noting that the GEF Operational Point in the country did not evaluate this performance.

* Globally, project performance has been rated for the entire period between S and HS.

Table 3‑2. Documentation on M & E (2008-2012)



Table 3‑3.Project evaluation ratings implementation according to the PIR



Rating: Highly Satisfactory (HS), Satisfactory (S)

Source: PIRS (Evaluator´s compilation)

* Project Progress Reports. Namely APR / PIRs. Final reports are also products of the sub-contracts made by the consultants and consulting firms.
* Final Project Report. *The Project Final Report has not been done(as of December 2012)*
* Meetings of the Project Coordinator. Six Minutes of the Project Steering Committee meetings were received corresponding to meetings conducted in 2008 (3), 2009 (2) and 2011 (1) but none in 2010 and 2012. They contain presentations of project development progress and its current status, and recommends actions to redirect its course.

#### Participation of the agencies in the project

This section seeks to assess the role played by other partner organizations involved in the PSC. The agencies involved in the project are mainly the DNE, UTE, UDELAR, DINAMA and the Chamber of Industries of Uruguay (CIU). According to the results of the project and the information received in interviews (see Section 6.4), we can conclude:

* The DNE as executing agency, in carrying out its functions as energy planning unit in the country and interpreting the will of political authorities responded from its planning perspective helping to enable a proper legal and regulatory framework for wind energy development. UWEP has been an instrument designed to support DNE duties and has facilitated achievements in its field of work as well as those achieved in its interaction with UTE, DINAMA and other agencies involved.
* UNDP Uruguay has had a close and intense work accompanying the project, facilitating and promoting interaction between the different project stakeholders.
* UTE, in fulfillment of its functions has developed wind farms on its own initiative but has also involved the private sector in wind generation business and enabled their participation in the market as external generators. In its interaction with the UWEP, this has facilitated the development of internal capacities and contributed to the development of technical, economic, environmental and social terms for the development of generation projects.
* The participation of GTER has been one of the initiating factors in the development of wind energy in the country. GTER has been instrumental in the development of technical components of the project including the assessment of the wind resource, the development of the wind measurement network, and the microanalysis of several projects, among others. However, the rapid development that has taken the wind power in the country has reached levels of knowledge and expertise in the development of wind farms has exceeded national capacities and led to the rapid demand of know-how abroad. This is a formidable challenge to the academic sector.
* UWEP in interaction with DINAMA developed the Strategic Environmental Assessment (SEA) for the energy sector. While the SEA contains some elements on wind energy, this assessment should be deepened for the wind energy, which requires qualified and sufficient personnel in DINAMA[[28]](#footnote-29).
* The UWEP / DNE supported by the Chamber of Industries of Uruguay (CIU) and as mandated by decrees on wind energy, developed the Assessment Methodology of the National Components of the Wind Energy Projects. The CIU certifies the percentage of national components in the wind farms.

#### Mid Term Evaluation

Medium-Term Evaluation was suspended for reasons beyond the project and was replaced by a Support Mission conducted in 2011 by the consultant R. Rijs. The objective of the mission was to assess the degree of progress of the project towards the expected results in the PRODOC, and make recommendations for the remaining period.

The findings of the mission were[[29]](#footnote-30):

1. “UWEP managed to establish an enabling policy and institutional framework (both in DNE as in UTE), but could continue to generate inputs for regulation (second-level) in the fields of: (i) planning and interconnection, (ii) distributed generation (DG) and / or self-consumption (500 kW - 5 MW), including the creation of a "single window", (iii) simplified regime for micro-generation, (iv) appropriate environmental permits and land use regimes for small projects.
2. It has helped in reducing the information barrier, but has carried out only part of the activities planned. The Project could expand in the following topics: (i) wind power capacity penetration on the network in combination with hydroelectric reservoirs, (ii) integration studies of DG systems in areas of low transmission capacity and / or distribution; (iii) technical training of UTE personnel to meet the demands of DG and micro-generation, (iv) updating the national wind map with UTE measurements, and (v) methods of "forecasting" in wind generation.
3. UWEP has promoted the construction of the first wind power project in the country by the development of regulatory instruments and promoting professional skills. However, it would be important to give greater support to (private) initiatives in progress and consolidate Project out comes. It is also important to address demands by society such as increased participation of Uruguayan companies in projects, the development of domestic products and services, environmental concerns, local benefits, information diffusion, all this this in cooperation with the AUdEE.”

This mission established following conclusions and recommendations:

* The Consultant believes that the Uruguayan Wind Energy Project is developing satisfactorily towards its main objectives. However caution should be taken in the barrier removal process, specifically in the areas of: (i) the legal basis of land use, (ii) assessment and regulation of the (negative) local environmental impact, (iii) support to distributed generation, and (iv) management of high levels of wind penetration in the grid.
* Several activities planned have lost their relevance, which justifies a reorientation of the project in terms of objectives and resources. In particular, it is recommended to cancel the acquisition of measurement towers as their added value is minimal and the GTER generated the wind energy map using UTE measurements. The funds associated with this item can be used for institutional strengthening of AUdEE, to run further studies, and possibly to establish a test center for wind technology development in the country.
* It is recommended that the Project Coordinator and Steering Committee make explicit the project exit strategy in terms of outputs and human resources. Relevant elements are: the project website, the maintenance of the national wind energy map, anchoring wind energy knowledge in the DNE and UTE, and the role of AUdEE.
* Finally, it recommends the UNDP office in Uruguay to request an extension of the project to GEF until June 2012.

As regards these recommendations is important to note that due to the rapid development of wind energy in Uruguay, new challenges emerged such as managing the high penetration of wind power in the country (as initially a 5 MW park was foreseen and development conduced to hundreds of MW), so the UWEP considered appropriate to conduct studies with Energinet (June 2012) on the interaction of wind energy with the national electricity system. UWEP also supported the distributed generation regulation.

The final term evaluator considers very appropriate the recommendations of the Mission of Mr. Rijs.

#### External Financial Audits

UNDP-Uruguay handled all the financial management and relevant supporting documentation. UNDP contracted an external financial audit for the project. This included a review of the CDRs (Combined Delivered Report), operating procedures used by the project according to the provisions of the UNDP, and the internal control environment of the project.

In accordance to UNDP rules, this project should conduct an audit. UNDP received the audit for the period January 1 to December 31, 2010. The audit report is clearly clean and without observations.

The evaluator considers that UNDP gave systematic monitoring of progress of activities, and therefore considers that the monitoring and follow-up of the project is ***Satisfactory (S)***.

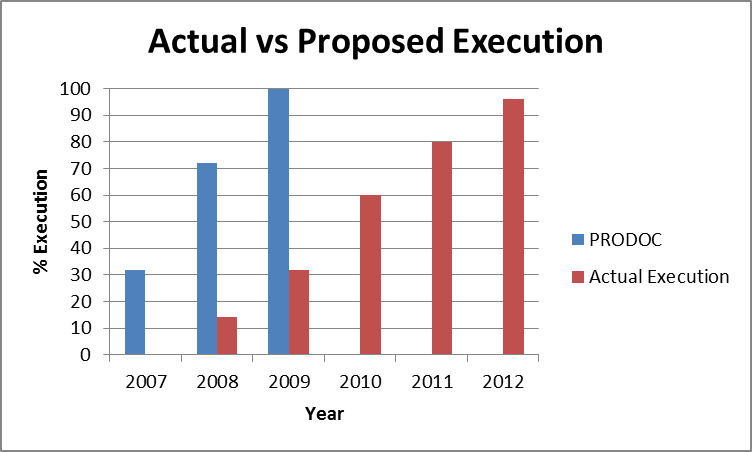
### Financial Planning

The project was carried out according to the ¨NEX" method, according to which transactions, contracts and disbursements necessary for the execution of the project are authorized by the executing agency, but are reviewed by UNDP.

In relation to the financial performance of the project, according to the PIR of June 30, 2012[[30]](#footnote-31), the GEF had estimated an outlay of US $ 842.054, which corresponds to 88.6% of a total of $ 950,000. A more recent UNDP report of December 31, 2012[[31]](#footnote-32) indicates a resource availability of GEF funds of US $ 7.192, thus implementation of GEF resources reached 99.24%.

As regards budget execution, the following figure shows the cumulative budget execution for the implementation of the project over a three years period versus the actual cumulative budget execution over the course of six years. As can be seen the execution was highest during the year 2010 having reached 30% of the total.

Figure 3‑1. Implementation of the proposed GEF resources in PRODOCs vs. actual execution



Source: PRODOCs and POAs

#### Amount of investment, co-financing and GEF leverage factor

According to PRODOCs, the total initial budget of the project was US $ 6.96 million, of which US $ 225,000 corresponded to contributions in kind from the GoU, and $ 5,750,000 in cash contribution by the GoU to implement a 5 MW wind farm.

But actually, the GoU through UTE installed not a 5 MW wind farm but two 10 MW farms each, for a total of 20 MW, ***four times the target set as wind generation capacity***.

The cost of Caracoles I (park of 10 MW) was US $ 27.5 M. This cost is a bit high for current values, but bear in mind that the purchase was made in 2007, and the site is a mountainous terrain with its consequent additional costs for site preparation, roads and grid lines. The cost of Caracoles II (park of 10 MW) was US $26 M, considering that the grid line had been set for Caracoles I [[32]](#footnote-33). Total co-financing investment was then US $53.5 M for 20 MW at a unitary cost of US $ 2.675 /kW installed.

The Table3‑4 shows the total amount of contributions currently planned and executed. It should be noted that the proposed figure of $ 225,000 as compensation has been considered as of June 20, 2011 and US $ 17.190 reported as verified in the mid-term evaluation. Since the final term evaluator found no support for this figure given in the PIR according to the Mission Report of Mr. R. Rijs, the evaluator assumes all in-kind contributions of the GoU. As above, the expected leverage factor for GEF resources would be of 7.33 (= 6,960,000 / 950.000), a high figure but largely superseded by the UWEP to reach the figure of 56.3! (= 54,718,000 / 950.000 = 56.3).

Table 3‑4. Contributions under the PRODOC and executed up to December 2012



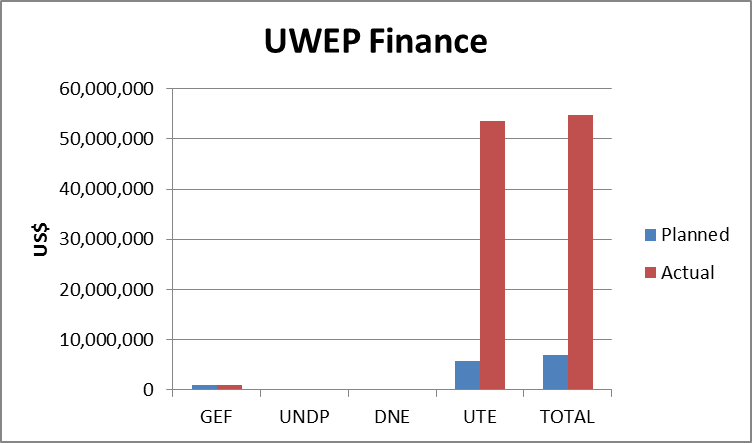
Source: PRODOCs and PIRs 2012 and 2011.

The Figure 3‑2 shows the resources provided in the PRODOC and executed by the project, which shows the great investment effort made UTE.

The leverage factor achieved by the project is 56! for the GEF, which the evaluator considers ***Highly Satisfactory (HS).***

The only external audit of the project received for the year 2010, as mentioned above, is clean and comments free (Section3.2.2.3). This indicates that there has been due diligence in managing GEF funds.

Figure 3‑2- Resources planned and executed currently by UWEP



### Replicability

The project considered that one of the risks that would affect the replication of the project would be the non-participation of stakeholders in the development of wind energy, especially of the private sector. The DNE with the support of UWEP achieved enabling legal and regulatory framework that has promoted the development of wind energy in the country, with 990.3 MW currently under development to be implemented until 2015 (See Table 3‑9).

Therefore, the expansion of the wind energy in the country is underway and the replicability of wind energy projects connected to the grid within the context of UWEP is ***Probable (P).***

### Effectiveness of the project

The results discussed and evaluated below show clearly that all them were successfully achieved. The level of penetration that the wind energy will reach in the country will exceed the objectives established in the project.

The next section shows how the emissions reduction by 2015 will achieve the goals set, and from 2016 onwards will exceed the reduction target widely. Significant progress was made in the legal, regulatory, operational, socio-political and institutional framework. There was also a great work of capacity building. ***Thus, UWEP has been a determining factor in the development and penetration of wind energy in Uruguay*.**

It is then considered that the UWEP has achieved its objectives and is in terms of effectiveness, ***Highly Satisfactory (HS).***

### Cost effectiveness of the project

According to the PRODOC[[33]](#footnote-34):

"The goal of this project is to mitigate greenhouse gas emissions by implementing large-scale, grid-connected wind energy systems in Uruguay. The directly avoided emissions are 0.18 Mton CO2 over the lifetime (20 years) of a 5 MW wind farm. The indirectly avoided emissions are 1.1 Mton CO2 over the period 2006-2015, with yearly savings after 2015 of minimum 0.26 Mton CO2"[[34]](#footnote-35).

"The cost-effectiveness of the GEF contribution to the UNDP/GEF UWEP initiative in terms of GEF funding per unit CO2-emissionsavoided, is: 0.78 USD/ton CO2related to the indirectly avoided emissions"[[35]](#footnote-36).

The Table 3‑5 shows the reconstruction of GEF calculations for avoided emissions costs for a wind power plant of 5 MW.

Table 3‑5. Estimated avoided emissions GEF costs (reconstruction)



Note: The indirectly avoided emissions considered in the PRODOCs are

6 times the directly avoided.

UWEP did not implement a 5 MW wind farm but UTE did implement a 2x10 MW park (Caracoles I and II), four times the originally expected capacity, and the country is also developing a wind project program that will reach a total capacity of 990 MW in 2015 (See Table 3‑9).

Taking into account the cost of the GEF investment (US $ 950,000), and the emissions reduced by UWEP in 2015 and in 2016 (when all plants commissioned in December 2015 are generating), the emissions avoided cost is US $ 0.104/tCO2 and US $ 0.044 tCO2, respectively (Table 3‑10).

Table 3‑6. Unit cost of emission reduction of UWEP

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **GEF Donation (MUS$)** | **Directly avoided emissions (MtCO2)** | **Indirectly avoided emissions\* (MtCO2)** | **Total avoided emissions (MtCO2)** | **Unit cost (US$/tCO2)** |
| 2015 | 0.95 | 1.31 | 7.83 | 9.14 | 0.10 |
| 2016 | 0.95 | 3.09 | 18.53 | 21.61 | 0.04 |
| \*Indirect Emissions = 6 x Direct Emissions | | |  |  |  |

These figures are 7.6 and 18.1 times lower respectively than the expected figure of US $ 0.79 of the PRODOC. The cost-effectiveness of the project is ***Highly Satisfactory (HS)*** for the UWEP, the Government of Uruguay and the GEF.

### Project Impact

The UWEP has been a project that has helped to change the conditions for the development of wind energy in Uruguay, contributed to the development of an enabling legal and regulatory framework for wind generation capacity, developed capacity in both DNE and UTE as well as in other government agencies and private actors, helped to establish an information system on the potential of wind power, contributed installing two wind farms of 10 MW each by UTE, and facilitated the participation of non-state actors in the development of the project, among other results.

***Therefore, UWEP is a project that has produced a great impact on the development of wind energy in Uruguay***.

It is important to note that the project was executed in optimal conditions because the state had established a long-term energy policy to introduce renewable energy, so the government environment and the commitment of institutions like DNE, UTE and UDELAR trough GTER, was crucial to the success of UWEP.

### Sustainability

The aim of this section is to assess the extent to which project benefits continue within or outside its boundaries after it is completed.

#### Development of Technical Capacity

As stated in the PRODOC, the project developed several components that have left an important capability in both DNE and UTE mainly, the two institutions leading the development process of wind energy. The project also used the valuable national capacity available in the GTER of UDELAR allowing this group to strengthen its national capacity and international visibility. In developing UWEP, technical knowledge and information was available to all stakeholders, employing different media and the project website (See <http://www.energiaeolica.gub.uy/>).

#### Ownership of Wind Energy Technology

The implementation of wind energy projects requires a wide variety of scientific and technological knowledge, as well as legal, regulatory, operational, environmental, social, and economic issues, among others. The UWEP has employed know-how resources appropriated by different national stakeholders in all these relevant issues. After reviewing the list of stakeholders and the diversity of activities involved in the wind projects, although there are international stakeholders, the high number of local stakeholders involved denotes a high ownership degree for the country. The institutions that have been more benefited have been the institutions directly involved in UWEP, like DNE, UTE, DINAMA and GTER of UDELAR.

#### Institutional Capacity Building

The most notable beneficiaries in terms of institutional capacity building have been again DNE and UTE. They have received the direct benefit of the project and both institutions have qualified their personnel, information and methodologies through project development so to ensure continuity in the use of wind energy. Other beneficiaries are DINAMA and regional governments through the project approximation to regional authorities and the community in general.

#### Financial sustainability of the projects implemented

Financial sustainability is likely through implemented projects and many projects underway by UTE and the private sector, in which private investors were guaranteed PPAs close to US $ 65/MWh for the latest developments and higher figures for the oldest.

Taking into account the above considerations we can say that the sustainability of the project is ***Probable (P).***

### Execution and Implementation modalities

The evaluator considers that UNDP Uruguay:

* *Effectively supported* the selection, recruitment, assignment of experts and consultants, and national counterparts in the definition of tasks and responsibilities.
* *Led jointly with the UNDP Regional Office in Panama* the consultation process for the approval of contracts.
* *Made timely payments* in relation to the fees and services hired by the UWEP.
* *In relation to the review of the products by the consultants, there were no judgments about their quality,* as it is a responsibility of DNE.

The meetings and interviews held with contractors and personnel hired by the project, as indicated earlier in this report, acknowledge that the participation of UNDP remained constant in relation to the quantity, quality and timeliness of inputs, and regarding their responsibilities for implementing the project.

The availability of funds was in line with the needs of the project, i.e. the provision of resources for payments was timely "following the due process for payment requests¨.

It is considered that the quality of the UNDP implementation has been ***Satisfactory (S).*** The quality of implementation by the DNE is considered ***Satisfactory (S).***

Therefore, the overall quality of the implementation and execution of the project is considered ***Satisfactory (S).***

## OUTCOMES

The following achievements are analyzed in relation to the Global Environmental Objective of the project, using as criteria the proposed indicators and sources of verification described in the PRODOC.

### Global Environmental Objective

The Global Environmental Objective is to **mitigate greenhouse gas emissions by implementing large-scale, grid-connected wind energy systems in Uruguay**. Table 3‑7 shows the Global Environmental Objective, indicators and sources of verification.

Table 3‑7. Global Environmental Objective. Indicators and sources of verification

| **Objective: To mitigate emissions of greenhouse gases in Uruguay implementing wind energy systems connected to the network on a large scale** | | |
| --- | --- | --- |
| **Project Strategy** | **Objectively verifiable indicators** | **Sources of verification** |
| **To remove the present barriers for the development of commercially viable wind energy investments in the country and establish a 5 MW showcase as a basis for replication.** | * Investment in wind energy technologies in Uruguay by private and public sector, leading to installed large-scale wind energy systems in Uruguay (2007: 5 MW; 2008: 15 MW; 2010: 30 MW; 2012: 50 MW; 2014: 50 MW); * Annual energy production from the installed wind capacity under UWEP; * Directly avoided emissions in Uruguay of 0.18 Mton CO2 over the lifetime (20 years) of the 5 MW wind farm; * Directly avoided emissions in Uruguay of 1.1 Mton CO2 over the period 2006-2015 due to installed wind capacity; * Yearly savings after 2015 of minimum 0.26Mton CO2 due to installed wind capacity. | * Figures on wind turbine market in Uruguay; * Number of local and international companies involved in wind market in Uruguay; * Baseline report by GoU on GHG emissions; electricity sector publications over time period; * Figures on wind-generated electricity sales in Uruguay; * Amount of capital investment in wind market. |

\* Mton = Mt = Million tons

The Global Environmental Objective of the project is the reduction of CO2 emissions due to electricity generation using a 5 MW wind power demonstration plant that should be developed during the project and the reduction due to increased wind generation capacity in the country.

As sources for verifying the achievement of the project global objective, we have used information provided by UTE and the figures obtained in the UWEP website on operating and awarded wind projects. Information was sought also on the web site of the AUdEE on the projects developed.

The emissions avoided by a wind farm during one year are calculated as

AE (tCO2/year) = P (MW) \* CF (%) \* 8760 (hours / year) \* EC (tCO2/MWh)

where:

* AE: Emissions avoided (tCO2/year)
* P: Wind Power expressed in MW
* CF: Capacity factor is the percentage of plant operating at full capacity and is calculated as the Electricity Generation during a year / Wind Power / 8760 h.
* EC is the coefficient of CO2 equivalent avoided emissions per unit of energy, expressed in tCO2/MWh.

For estimating the avoided emissions the PRODOC employed a CF= 35% and EC = 0.5871 kg CO2/kWh = 0.5871 tCO2/MWh[[36]](#footnote-37). Table 3‑8showsthe expected wind power additions between 2007 and 2015 according to the PRODOC, and their corresponding avoided emissions. As shown in the Table 3‑8, at the end of 2015, 150 MW ought to be installed and their cumulative avoided emissions reach 1.16 Mt of CO2.

Table 3‑8. Target of wind power and CO2 emission reduction according PRODOC



Source: Estimated using data from the PRODOC verification

Table 3‑9 shows the current installed wind capacity additions until January of 2013 totaling 52.5 MW. In 2013 two new additions were made: Kentilux 7.2 MW and Engraw 1.8 MW. Additional projects granted in 2011 and 2012 (corresponding to the decrees 77/006, 403/009, 159/011 and 159/011) are expected to enter in operation. By December 2015, it is expected that total installed capacity will be 990.3 MW of wind power.

Table 3‑9. Current and expected wind power



Source: Based on information from the DNE

Table 3‑10 shows the cumulative wind power until December 2012, the expected capacity additions between 2013 and 2015, and cumulative wind capacity until December 2016. The cumulative capacity differs from the effective capacity in that the latter considers the date of entry into operation of the new capacity additions (e.g., a plant which is expected in December, adds power that year, but only until next year generates power and reduces emissions). The table uses UTE data of wind generation for the years 2008-2012. The generation of new plants has been estimated with a capacity factor of 35%, as assumed in the PRODOC[[37]](#footnote-38),[[38]](#footnote-39).

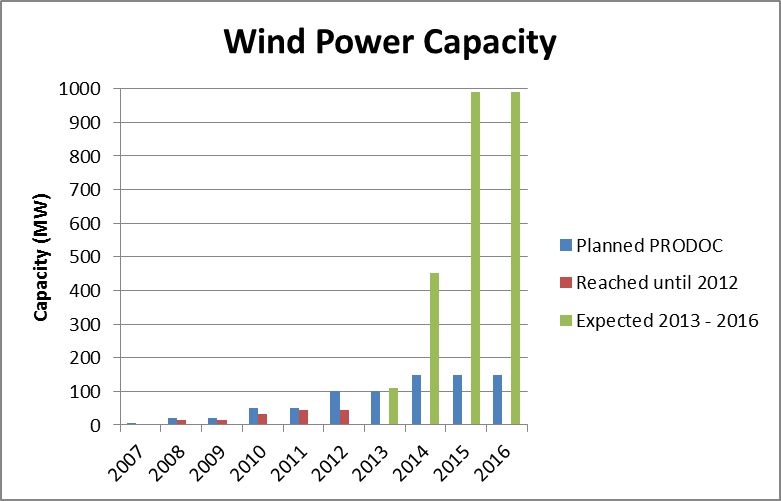
According to previous calculations, the cumulative emissions reduction up to December 2012 are 0.20 MtCO2 and with new capacity additions until 2015, the avoided emissions are expected to reach 1.31 MtCO2 on December 2015 and 3.09 MtCO2 on December 2016 .

Table 3‑10.Project Direct CO2Emissions Reduction

Source: Compiled from information by UTE & DNE

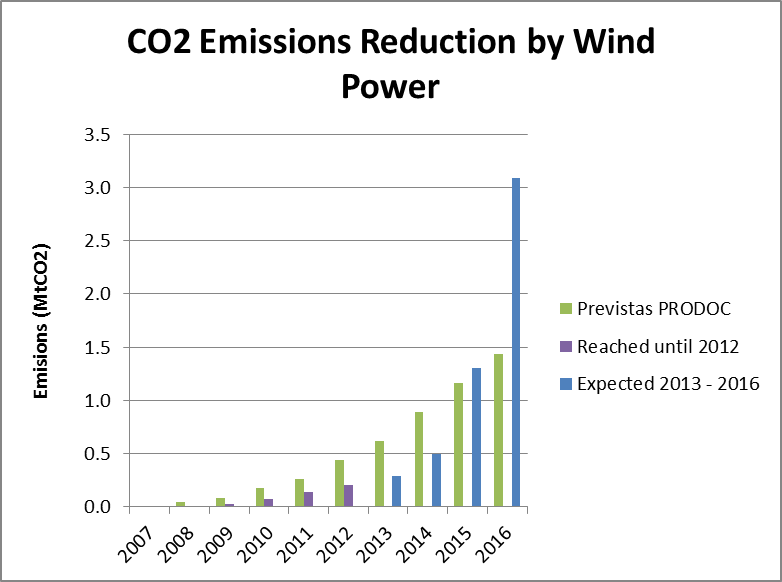
The Figure 3‑3 shows the evolution of the wind capacity foreseen in the PRODOC assumptions until 2016, the capacity achieved until December 2012 and the expected capacity to be reached on 2013. As can be seen from the figure, the cumulative wind power on 2013 corresponds to the power expected in the PRODOC for same year, but by 2015 the installed capacity will be between 6 and 7 times higher than expected in the PRODOC.

Figure 3‑3. Wind capacity provided by the PRODOCs and achieved by the project



The Figure 3‑4 shows that as of December 2012 avoided emissions are lower than those estimated by the PRODOC for same year, but already in 2015 they are comparable to those of the PRODOC and the avoided emissions in 2016 will be twice higher than those expected in the PRODOC.

Figure 3‑4. CO2 emissions reduction by wind generation



Consequently, the power addition and avoided emissions results exceed by far those expected by the project.

Information on the wind turbine market was not available but it is clear that if the 2 MW standard wind turbine is used for estimating the number of wind turbines installed or to be installed, then for the development of 990.25 MW by the end of 2015, it is necessary the deployment of 495 units. And as for the amount of investments required, these figures are considered confidential by the developers and have not been made available. Both issues are so highly favorable to the UWEP because it is a considerable volume of turbines and a large amount of capital investment in the country.

The project has achieved the following goals:

* The 5 MW demonstration project was not carried out but UTE co-financed a of 2x 10 MW park, a figure *four times higher than UWEP goals.*
* In 2012 the installed capacity reached 43.5 MW versus 100 MW planned in the PRODOC. In 2015, the program will have reached 450.7 MW compared to 150 MW planned in the PRODOC, a figure *three times higher UWEP goals*.
* As for emissions reduction, on 2015 the cumulative reduction of emissions will amount to*1.31 MtCO2 compared to 1.1 M tCO2 on the PRODOC (119%).*
* Starting in 2015 the emissions reductions will be 0.81 MtCO2/year, compared with 0.26 MtCO2/year expected in the PRODOC, a figure *three times higher than expected*.

The evolution of installed capacity and also the bids awarded made with direct support from UWEP, are a milestone that occurred in Uruguay in relation to wind energy on reaching 1000 MW. This is a very good result for the development of renewable energy in the country, an increase of renewables in the energy mix, reducing the dependence on imported fuels, among other benefits for the country. From the point of view of the UNDP-GEF it is a successful implementation case. From the point of view of the GEF is an extraordinary achievement in terms of project formulation and implementation of emission reduction projects, low cost of avoided emissions and high investment leverage.

The evaluator considers that, given the results achieved and the prospect of future development on a three year time horizon, with the implementation of the projects already awarded, the fulfillment of the global objective is ***Highly Satisfactory (HS)***

### Outcome 1. An enabling policy framework has been created, including regulations for grid access and dispatch, construction and operation of wind farms, technical codes, and financial incentives for wind-generated electricity.*[[39]](#footnote-40)*

Table 3‑11 shows the outcome 1, its indicators and sources of verification.

One of the most important developments in the energy sector in Uruguay has been the development of an Energy Policy for the 2005-2030 time horizon. This policy integrates a multidimensional vision of technological, economic, geopolitical, environmental, ethical and social factors. In 2005 began this discussion with the participation of public actors involved in the energy country´s sector. By the year 2008 the approval by the Executive of this long-term policy was achieved. It has in its strategic development four focal points: Strategic guidelines, goals (short-term (2015), medium (2020) and long term (2030) goals), Lines of Action, and Permanent Analysis of the Energy Situation at global, national and regional level. In 2010 a Country Policy is established as a result of inter party agreement. Thus were set the basis of the State Policy which has down as one of its core components the development of renewable energy to keep carbon emissions, reduce fossil fuel imports, reduce and stabilize electricity prices , build local capacity and improve energy independence. Renewable energy sources identified were bioenergy, small hydro, solar thermal and wind power.

It must be highlighted that the UWEP began at a time when there was an established long term energy policy and emerges as an appropriate enforcement tool because of its flexibility. The UWEP is rightly inserted in developing the country's energy policy.

Table 3‑11. Outcome 1. Indicators and sources of verification

| **R#** | **Project Strategy** | **Objectively verifiable indicators** | **Sources of verification** |
| --- | --- | --- | --- |
| **1.0** | **OUTCOME 1**  **An enabling policy framework has been created, including regulations for grid access and dispatch, construction and operation of wind farms, technical codes, and financial incentives for wind-generated electricity.** | * Amendments to the policy framework and technical regulations in place, enabling the public and private delivery model, measured in five steps: (i) full enabling environment for public delivery model (30%); (ii) implementation of first 5 MW wind farm (10%); (iii) full enabling environment for private delivery model (30%); (iv) publication of call for tendering a second wind farm (20%); and (v) assignment to private company to invest and operate wind capacity (10%). | * Publication of positive decisions to accept enabling measures; * 5 MW wind farm installed and operational; * Publication of tender calls and assignment to third party. |
| 1.1 | * Implementation of amendments to regulations and procedures for enabling wind energy systems to be connected to the grid. | * Anticipated studies and analysis carried out by/for DNE; * Proposals and amendments presented by DNE; * Proposals and amendments approved by competent authorities and implemented. | * Reports with analysis and proposals; * Implementation of proposals in the regulatory framework. |
| 1.2 | * Implementation of technical standards for wind energy applications in Uruguay. | * Appropriate standards for wind energy technology designed and presented by/for DNE; * Standards approved and implemented by competent authorities. | * Reports with analysis and proposals; * Implementation of standards and procedures into the normative framework. |
| 1.3 | * Evaluation of the cost of wind energy connected to the national electricity system and the proposal of an incentive mechanism. | * Anticipated evaluation carried out by/for DNE and proposal presented to competent authorities; * Proposals for price incentive to open a wind energy market in Uruguay approved and implemented by GoU. | * Reports with analysis and proposals; * Publication of formal approval price mechanism. |
| 1.4 | * Streamlining of procedures to support project development in relation to spatial and environmental planning, including supportive studies. | * Anticipated studies carried out for DNE and results made available to target stakeholders; * Consultation with lower authorities and design and implementation of streamlined procedures facilitating wind energy investments. | * Reports with results from studies; * Existence of improved procedures. |
| 1.5 | * UNDP / GEF Execution monitoring and an evaluation component | * Execution monitoring activities according to the UNDP / GEF M & E plan guidelines * UNDP / GEF Running an independent external mid-term and final evaluation | * Work plan and mission Report * Evaluation Report. |

**Legal Framework for Wind Energy**

The electricity market in Uruguay is segmented into generation, transmission, distribution and marketing. Transmission, distribution and marketing are subject to the activity of a single agent, the state-owned company UTE. The generation market is open to the private sector. A private agent can generate and connect to the public grid under certain prescribed conditions (technical and environmental).

The current legal framework is composed of a set of laws and decrees, some of which are general to all power generators and others are specific to wind generators, and / or other renewable power plants[[40]](#footnote-41). Table 3‑12shows the Laws and Decrees for the electricity sector in general and provides the framework for the regulation of the wind power sector.

Table 3‑12. Legal and Regulatory Framework for Electricity Sector - Technical and contractual

| **Year** | **Law or Decree** | **Object / Subject** |
| --- | --- | --- |
| 1977 | Law No. 14,694. | [National Electricity Law](http://200.40.229.134/leyes/AccesoTextoLey.asp?Ley=14694&Anchor=) |
| June 17, 1997. | Law No. 16,832 | [Act Electricity Sector Regulatory Framework](http://200.40.229.134/leyes/AccesoTextoLey.asp?Ley=16832&Anchor=) |
| June 28, 2002 | [Decree 276](http://www.presidencia.gub.uy/decretos/2002072501.htm), | General Regulatory Framework Regulation Electricity System |
| June 28, 2002 | [Decree 277](http://www.presidencia.gub.uy/decretos/2002072502.htm), | Electricity Distribution Regulation |
| June 28, 2002 | [Decree 278](http://www.presidencia.gub.uy/decretos/2002072503.htm), | Regulation of Transmission of Electricity |
| 2007 | [Decree 228/007](http://www.presidencia.gub.uy/_Web/decretos/2007/06/IE423_28%2005%202007_00001.PDF), | Substitution of Article 103 of the Rules of electric power transmission |
| September 10, 2007 | [Decree 366/007](http://www.presidencia.gub.uy/_web/decretos/2007/09/IE459AS187_11%2009%202007_00001.PDF) | Amends Articles 11, 17, 18, 19 and 68 of Decree 277/002. |
| September 11, 2002 | [Decree 360/002](http://www.presidencia.gub.uy/decretos/2002091101.htm) | Regulation of the Wholesale Electricity Market |
|  | [Decree 72/010](http://www.presidencia.gub.uy/_web/decretos/2010/02/46%20.pdf) | Complements the terms of Decree 360/002 to obtain authorization from the Executive for the installation of electrical power generation. |
|  | [Decree 389/005](http://www.presidencia.gub.uy/_Web/decretos/2005/10/ASUNTO%20330_07%2010%2005_00001.PDF) | Sets electricity purchase contracts to fixed price. |
| January 31, 2007 | [Decree 44/007](http://www.presidencia.gub.uy/_Web/decretos/2007/01/23_15%2009%202006_00001.PDF) | Sets the remuneration system for electric power transmission. |
|  | [Decree 229/007](http://www.presidencia.gub.uy/_Web/decretos/2007/06/424_28%2005%202007_00001.PDF) | Fixing charging and parametric system by use of transmission power. |
| February 22, 2010 | [Amending Decree No. 72/10](http://www.presidencia.gub.uy/_web/decretos/2010/02/46%20.pdf) the [Decree 360/002](http://www.presidencia.gub.uy/decretos/2002091101.htm) | To install electricity generating plants (of any primary source) is required to obtain authorization from the Executive, meeting the requirements of Articles 53 and 54 of the Regulations of the Wholesale Electricity Market (Decree 360/002) |

The development of wind energy has required a legal and regulatory framework complementary to the electricity sector, in terms of technical, contractual, environmental and tax issues. This framework has allowed the contracts of wind power by the UTE, develop terms for dispatching of wind energy, extending the lease on the sites for the development of wind farms, among others. Table 3‑13 shows the technical and contractual aspects of this framework.

Table 3‑13. Legal and Regulatory Framework for Wind Energy - Technical and contractual

|  |  |  |
| --- | --- | --- |
| **Year** | **Law or Decree** | **Object / Subject** |
| March 13, 2006 | [Decree 77/006](http://www.presidencia.gub.uy/_Web/decretos/2006/03/73_13%2003%202006_00001.PDF), Decrees[397/007](http://www.presidencia.gub.uy/_web/decretos/2007/10/490_28%2005%202007_00001.PDF),[296/008](http://www.presidencia.gub.uy/_web/decretos/2008/06/IE631_10%2006%202008_00001.PDF)and[299/008](http://www.presidencia.gub.uy/_web/decretos/2008/06/633_10%2006%202008_00001.PDF) | UTE is instructed to call for competitive tender process to provide 60 MW of non-conventional renewable sources |
| 2009 | [Decree 258/009](http://www.presidencia.gub.uy/_web/decretos/2009/06/876.pdf), | Sets conditions for those who provide wind data series for the development of the [Wind Map of Uruguay](http://www.energiaeolica.gub.uy/index.php?page=mapaeos) under the Convention between the MIEM and the University of the Republic |
| 2009 | [Decree 377/009](http://www.presidencia.gub.uy/_web/decretos/2009/08/925.pdf) | Tender offer to companies that will match the winning bid of 15 MW. UTE, under this decree, signed contracts with three private companies for a total amount of 28.45 MW. |
| August 24, 2009 | [Decree 403/009](http://www.presidencia.gub.uy/_web/decretos/2009/08/931.pdf) | Entrust UTE to promote, through a competitive process, the realization of wind power contracts with the private sector for a nominal power of 150 MW, and leaves for a second stage of the regulation the completion of additional 150 MW to reach the 300 MW target for 2015 |
| February 1, 2010 | [Amending Decree 41/010](http://www.presidencia.gub.uy/_web/decretos/2010/02/IE1033%20.pdf) |
| December 9, 2009 | [Decree 460/009](http://www.presidencia.gub.uy/_web/decretos/2009/12/460.pdf) | Supplementing Decree 360/002 and sets the particular conditions for dispatching wind energy. |
| December 9, 2009 | Decree 567/009 | Sets the dispatch methodology of wind farms. This decree complements the Wholesale Electricity Market regulation, which did not include dispatch rules for this form of generation. |
| 2010 | [Decree 343/010](http://archivo.presidencia.gub.uy/sci/decretos/2010/11/miem_353.pdf) | Modifies the documentation to be submitted for obtaining the authorization for generation connected to SIN granted by the Executive, for UTE calls under the Decree 403/009 |
| July 14, 2010 | Law 18,666 | Modifies the maximum lease period for a property employed for wind generation setting a maximum of 30 years. |
| May 6, 2011 | [Decree 159/011](http://www.presidencia.gub.uy/sci/decretos/2011/05/miem_68.pdf) | It mandates UTE to contract with privates 150 MW from wind energy. The power set was conducted through the competitive process K41938, where 192 MW were awarded, that contribute to the goal of having at least 300 MW of installed capacity of wind power by 2015. |
| December 6, 2011 | [Decree 424/011](http://archivo.presidencia.gub.uy/sci/decretos/2011/12/miem_475.pdf) | UTE was tasked with concluding wind power contracts for companies that submitted bids in the previous call (159/011) and were not selected. 9 offers were awarded ad-referendum in the first instance, for a total of 437.8 MW, the remaining other wait for the assessment of the offers by July 2012. |

In addition, consistent with the sustainable development, the environmental and land use regulation, the legislation on access to sites for wind energy exploitation has been developed (Table3‑14).

Related also to the promotion of wind energy and taking into account the national interest to encourage foreign investment and domestic industry, a legal and regulatory framework to promote renewable energy has been developed (Table 3‑15 ).

Table 3‑14.EnvironmentalandLand Use Regulation

| **Year** | **Law or Decree** | **Object / Subject** |
| --- | --- | --- |
| January 26, 1994 | Law No. 16,466 | [Law on Prevention and Environmental Impact Assessment](http://200.40.229.134/leyes/Ley16466.htm) |
| 21 Septem. 2005 | RegulatoryDecree[349/005](http://www.presidencia.gub.uy/_Web/decretos/2005/09/CM-123_28%2009%202005_00001.PDF)previousAct | Regulates the environmental impact assessment and permits. |
| 2007 | [Law No. 18,362](http://www.parlamento.gub.uy/leyes/AccesoTextoLey.asp?Ley=18362&Anchor=), Articles 241 to 250 | The legislation on access to the sites for the exploitation of wind energy source ("wind right to access"). |
|  | [Law No. 18,308](http://www.presidencia.gub.uy/_web/leyes/2008/06/V287PARTE1__00001.PDF) | Land Planning Act. Sets overarching framework for land use planning and sustainable development. |

Table 3‑15. Legal and regulatory tax framework

|  |  |  |
| --- | --- | --- |
| **Year** | **Law or Decree or Resolution** | **Object / Subject** |
|  | [The Law for the Promotion and Protection of Investments](http://200.40.229.134/leyes/AccesoTextoLey.asp?Ley=16906&Anchor=), No. 16,906 | Framework of incentives for investment in the country. Investment projects should be submitted to the Committee of Application of the Ministry of Economy and Finance |
| March 4, 1998 | [Decree 59/998](http://www.energiaeolica.gub.uy/uploads/documentos/decreto_59_98.pdf) | Sets VAT and IMESI exemptions, and VAT return under certain conditions. |
|  | Decret220/998, A46 and 47 | Regulates the investment law as regards VAT. |
| November 26, 2007 | [Decree 455/2007](http://www.presidencia.gub.uy/_web/decretos/2007/11/835_19%2010%202007_00001.PDF) | Investments are rated and according to the score obtained, the tax benefits are granted. The criteria for the allocation of these benefits are: employment generation, decentralization, increased exports, increased domestic added value, use of clean technologies, increased research and development and innovation (R + D + i) and impact of the project on economy. The exemption is between 51% and 100% of the invested amount and the term can vary from one to thirty years, applying different exemption rates. |
| January 9, 2012 | [Decree 2/012](http://archivo.presidencia.gub.uy/sci/decretos/2012/01/mef_705.pdf) | Sets modifications to the methodology for evaluating investment projects established in the Decree 455/007 |
| August 3, 2009 | [Decree 354/009](http://www.presidencia.gub.uy/_web/decretos/2009/08/245%20.pdf) | Promotes, under Article 11 of Law 16,906, a set of activities among which are electric power generation from nontraditional renewable sources, domestic manufacture of machinery and equipment bound for these and other related activities. |
|  | [Resolution 67/002](http://www.energiaeolica.gub.uy/uploads/documentos/Resolucion%2067002%20art%2038%20decreto%20220998.pdf) of DGI | VAT exemption for complete renewable energy generation equipment consisting in tower, wind mills, wind turbines, safety equipment, load controls and power inverters. |
|  | Resolution[1508/2010](http://www.energiaeolica.gub.uy/uploads/documentos/Res%20DGI%201508%20(IRAE).jpg) of DGI | Enacts that the documentation issued by UTE has the validity for withholding the Income Tax of Individuals by the taxes generated in the activity of micro-generation connected to the grid at low voltage. |

In addition to the above aspects linked to the large-scale wind generation, the project also was involved in wind generation for the industry (Table3‑16). Proof of this is the entry into operation of a 1.8 MW wind turbine for the company Engraw in January 2013. This turbine will generate for the factory consumption and sell the surplus in the spot market.

Table 3‑16.WindGeneration Regulation for the Industrial Sector

|  |  |  |
| --- | --- | --- |
| **Year** | **Law or Decree or Resolution** | **Object** |
| May 17, 2012 | [Decree 158/012](http://archivo.presidencia.gub.uy/sci/decretos/2012/05/miem_589.pdf) | Sets the possibility that Industrial Consumers of electricity generated by wind power can conclude sell/purchase contracts with UTE. It recognizes three possible contract modalities: Generation on-site, off-site and in partnership with others. |
|  | [Supplementary Decree](http://www.energiaeolica.gub.uy/uploads/eolica%20industrial/Decreto%20e%C3%B3lica%20industrial%20complementario.pdf) | Set the price for the energy in the system and how it is calculated and updated, among other issues. |

Uruguay is also a pioneer in South America in releasing the connection to the public low-voltage distribution grid for the electricity generated from renewable sources (Table 3‑17).

Table 3‑17. Legal Framework for Micro-Generation - Commercial and Technical Aspects.

|  |  |  |
| --- | --- | --- |
| **Year** | **Law or a Decree or Resolution** | **Object / Subject** |
| 1st July 2010 | [Decree 173/010](http://www.presidencia.gub.uy/sci/decretos/2010/06/miem_56.pdf), | Enables connection to the low voltage grid for renewable energy generators (wind, solar, biomass and small hydropower). It also sets the commercial conditions for purchasing excess energy, and ensures contracting periods of 10 years. |
|  | [Resolution 1895/010](http://www.energiaeolica.gub.uy/uploads/Microgeneraci%C3%B3n/Resolucion%20MIEM%201895-010.pdf) | For low power. For energy exchange, signed agreement with UTE and meet the General [Conditions](http://www.miem.gub.uy/portal/hgxpp001?5,6,554,O,S,0,SRC;51;0;5067;N;SRCMNU;E;49;7;MNU;,), which have been set by MIEM, and Particular [Conditions](http://www.ute.com.uy/servicios_cliente/firmas_instaladoras/microgeneracion.htm) approved by UTE. |
| July 29, 2010 | [Resolution 163/010](http://www.energiaeolica.gub.uy/uploads/documentos/Resoluci%C3%B3n%20163-10%20del%20P%20E%20%282%29.pdf) URSEA | Requirements to be applied by UTE for measuring the electricity of micro-generators. |
| 2010 | Resolution 1896/010 | See <http://www.energiaeolica.gub.uy/index.php?page=informacion-y-estudios> |

In this way, Uruguay has developed **an enabling legal framework that includes regulations for access and supply to the grid, construction and operation of wind farms, technical codes, and financial incentives for wind-generated electricity.**

It is precisely during the development of this framework that, the role played by the UWEP from mid-2007 until 2012must be highlighted, through its interaction between the DNE with UTE, other ministries and state agencies as well as with other stakeholders involved in the development of the wind energy in the country.

As regards the Outcome 1.2, for the development of appropriate standards approved by competent authorities is necessary to note, firstly that the final recipient of these standards is primarily the UTE and to a lesser extent, individual users and the companies that develop self-generation projects using wind power. Secondly, the regulatory process in URSEA (Regulatory Unit of Electricity and Water) involves different stakeholders and is very time consuming. And thirdly, the speed required for the bidding process by the UTE prompted the development of this this regulation and its introduction in the UTE bidding processing wind energy purchases (Decree 403/009 for 150.0 MW and Decree 159/011 to 192.0 MW).

The regulation considers diverse fields such as the environmental, social, technical and economic, and more specifically in the electricity sector, quality standards for electrical signals and electrical system compatibility. UTE officials and engineers participated in the process funded by UWEP. UWEP also sponsored missions abroad to update the information on wind energy standards. Therefore, these standards are found in the UTE bidding process statements and are accessible on the UTE website. This response corresponds to the UWEP adaptive management quickly answering to the demands of the development of wind energy projects.

UWEP also considered the micro-generation as a necessity in Uruguay due to the possibility of using small scale wind systems in the far isolated regions of the country. UWEP launched the National Wind Turbine Contest in June 2008, which was awarded on December 2, 2008 to the companies SOLCO and Amplin to develop wind turbines with capacities of about 1 kW. An additional direct result is the development of unified standards with the UTE for small scale wind systems (see The Site of the Installer, folder: Micro-generation in

<http://www.ute.com.uy/servicios_cliente/firmas_instaladoras/firmas_instaladoras.htm>).

Another additional result is the work done with the Chamber of Industries of Uruguay in the development of regulations to deliver the "certificate of origin" of the components of the wind farms, to verify the share of at least 20% national components, as required in the bidding processes. This forms part of restrictive mechanisms and incentives developed under Outcome 1.3.

As regards Outcome 1.4, facilitation of procedures to support the development of projects in relation to environmental and land use planning, UWEP elaborated with DINAMA´s support, the Strategic Environmental Assessment (SEA) of the National Energy Policy 2005 - 2030. The SEA is an integration tool that supports multi-sectorial approaches to the process of decision making incorporating environmental considerations and other sustainability objectives in the formulation of policies, plans and programs in the long term. The main objective was the "Assessment of the four focal points of the Energy Policy with a strategic approach incorporating concepts of sustainability."

The absence of a Normative Environmental Framework oriented to the wind energy development that should be developed by DINAMA and that has not gone hand in hand with the wind energy development, appears as a deficiency. UWEP worked together with DINAMA in the process of Previous Environmental Authorizations (AAP). However there is no clarity about the procedures of the AAP. This deficiency is probably one of the main current barriers to the development of wind energy, linked to the limited technical capabilities of DINAMA in the energy sector and particularly in wind energy.

The project has met the Outcome 1 **Satisfactorily (S).**

### **Outcome 2:** Information has been produced and made available to prepare and facilitate identified wind energy projects, as well as information and promotion for stakeholders and the broader public.

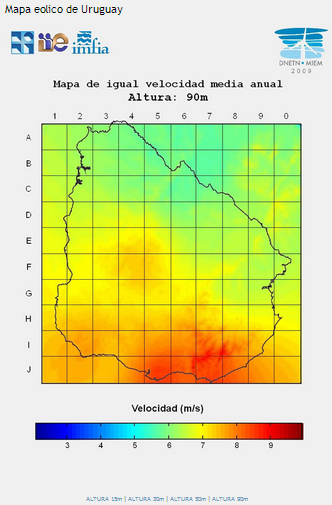
These outcome activities are related to the GTER of the University of the Republic. GTER has played an important role in the development of wind energy in Uruguay. GTER established since 1988 an agreement with UTE for working in wind energy. In the period 1988-1993 GTER conducted the assessment of the wind potential of the country. In 2003, the University participated in the development of an initial proposal for the GEF, which was stalled until 2005, when it began to make a second version, the current UWEP.

Table 3‑18. Outcome 2. Indicators and sources of verification

| **R#** | **Project Strategy** | **Objectively verifiable indicators** | **Sources of verification** |
| --- | --- | --- | --- |
| **2.0** | **OUTCOME 2**  **Information has been produced and made available to prepare and facilitate identified wind energy projects, as well as information and promotion for stakeholders and the broader public.** | * 3-yr wind measuring Programme in Uruguay carried out successfully; * 3 Feasibility studies for wind projects carried out; * Improved awareness on wind energy opportunities among a broader public; * Project monitored and evaluated by UNDP/GEF and results made public. | * Publications (documents, electronic media) with anticipated information, wind maps, etc.; * Reports and publication of performed studies; * UNDP/GEF monitoring and evaluation reports. |
| 2.1 | * Implementation of a wind measuring Program to assess the wind potential in Uruguay, including the creation of a wind atlas | * Data collection and processing; * Calculations of wind potential and production of regional wind maps; * Micro-sitting on a number of selected sites for feasibility studies; * Design and implementation of data monitoring and analysis system, and training on its use. | * Publications with anticipated wind maps, calculations; |
| 2.2 | * Execution and publication of feasibility studies for UTE's proposed first 5 MW wind farm and for two (2) more early-investment wind energy projects. | * Feasibility study for first wind farm carried out for DNE including : (i) detailed micro-sitting; (ii) EIA assessment; (iii) assessment of socio-economic, cultural and archaeological constraints. * Two more feasibility studies carried out for DNE and made available to third-parties through appropriate, transparent mechanisms (at least one as part of a PPA scheme for third-party generation). | * Reports and publication of performed feasibility studies; * Calls for bidding procedures. |
| 2.3 | * Creation of knowledge and awareness on the opportunities of wind energy among relevant stakeholders and the society as a whole. | * Involvement of stakeholders and society by requests for information, participation, initiatives, etc.; * Publicity by newspapers, TV, radio; * Anticipated number of publications (minimally 3), CD's (1), website (1), best practices guide (1). | * Evidence of participation / initiatives by local parties; * Records of activities performed by the project; * Anticipated products physically delivered. |
| 2.4 | * Execution of a UNDP/GEF monitoring and evaluation component. | * Execution of monitoring activities according to the M&E plan following UNDP/GEF guidelines;   Execution of external, independent mid-term and final evaluation by UNDP/GEF. | * Work plan and mission reports; * Evaluation reports. |

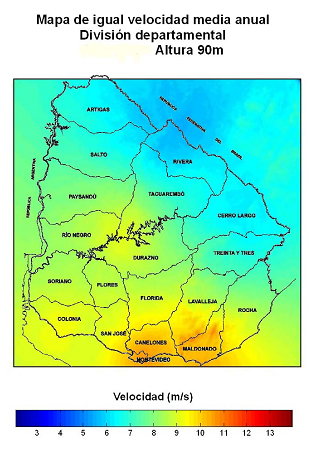
In relation to Outcome 2.1, the UWEP established a cooperation agreement with the UDELAR (April 15, 2008) for the development of the Wind Map of Uruguay. Earlier in the period 1990-1991, the DNE had advanced a measurement campaign in 18 locations around the country, along with information from other 28 stations which was analyzed to establish the quality of the information. Gathering and processing this information in 2009 resulted in the Wind Map of Uruguay (Figure 3‑5). This figure shows the spatial distribution of mean annual wind speed in m / s at 90 m height (also available at 15, 30 and 50 m in height), basic information to estimate the wind potential of the country. The same map with the political departments shows the regional distribution of the resource (Figure 3‑6).

Figure 3‑5.WindMap of Uruguay (90 m height)



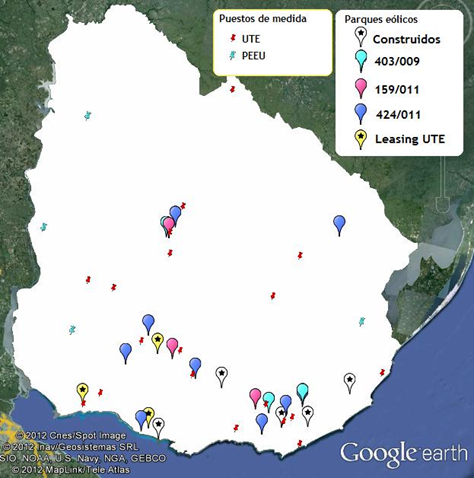
Source: <http://www.energiaeolica.gub.uy/index.php?page=mapa-eolico-de-uruguay>

Figure 3‑6. Departmental Wind Map of Uruguay



For the development of the measurement campaign of UWEP, UDELAR established the technical specifications for the purchase of equipment[[41]](#footnote-42) and considered the validity of installing the equipment in telecommunication towers[[42]](#footnote-43). UWEP advanced the acquisition of the equipment following the procedures of UNDP[[43]](#footnote-44). Four measuring stations were acquired with UWEP resources and installed in ANTEL telecom towers[[44]](#footnote-45). The stations are: Arroyo Black (started measuring since24/09/2010), Egaña (05/09/2010), Lascano (26/09/2010) and Itapebí (06/04/2011) (Figure 3‑7). The three first complete on March 2013, 30 months of operation and Itapebí 23 months.

Figure 3‑7.Map of measuring sites and wind farms (2012)



Source: <http://www.energiaeolica.gub.uy>

A wind data monitoring and analysis system was also designed and implemented. In Uruguay, the institutions that measure wind were the DNE, UTE, the Faculty of Engineering (FI) of UDELAR, the National Directorate of Meteorology (DNM) and the Department of Oceanography, Hydrography and Meteorology of the Navy (SOHMA) .While the last two are interested in characterizing the wind as a climate factor, the first is interested in the wind as an energy resource. UDELAR recommended that UTE should centralize and handle the available data[[45]](#footnote-46). This was the option that has been implemented. Data management (collection and information processing) is performed in the UTE by two officials who were trained and paid by the UWEP. They have now joined UTE staff.

Micro-siting analysis for feasibility studies is a complex process to which UDELAR has contributed significantly. As a result, UDELAR has recommended micro-siting studies in the departments of Montevideo, Canelones, Maldonado, Rocha and Lavalleja that present the highest wind velocities in the country. As of November 2011, UWEP uploaded on the web site an *Energy production tool* that calculates the energy delivered by a wind generator from the power curve of the wind turbine and wind resource in a particular place[[46]](#footnote-47). The tool has its instructive.

As relates to Outcome 2.2, the execution of feasibility studies for the first 5 MW plant and the two investment projects, as mentioned before, instead of a 5 MW plant two 10 MW wind farms were constructed ( Caracoles I and II)[[47]](#footnote-48). For the micro-siting and generation studies of these wind farms, a physical model of the site and the wind turbines was used, and the behavior of the park was simulated in the wind tunnel of UDELAR. Subsequently, numerical models used by the project contractors confirmed the results of the UDELAR simulation. Therefore, these studies were conducted for two parks and a study for a third wind farm was not performed as planned in the PRODOC. But subsequently to the development of these two farms, the UTE group is working on two additional developments in Artigas (67 MW) and Colonies (70 MW together with Eletrobras), so it is considered that UWEP achieved the goals in terms of feasibility studies. Regarding the Environmental Impact Assessments (&EIA) for Caracoles the participation of UWEP is not known nor the assessment of socio-economic constraints, cultural and archaeological issues.

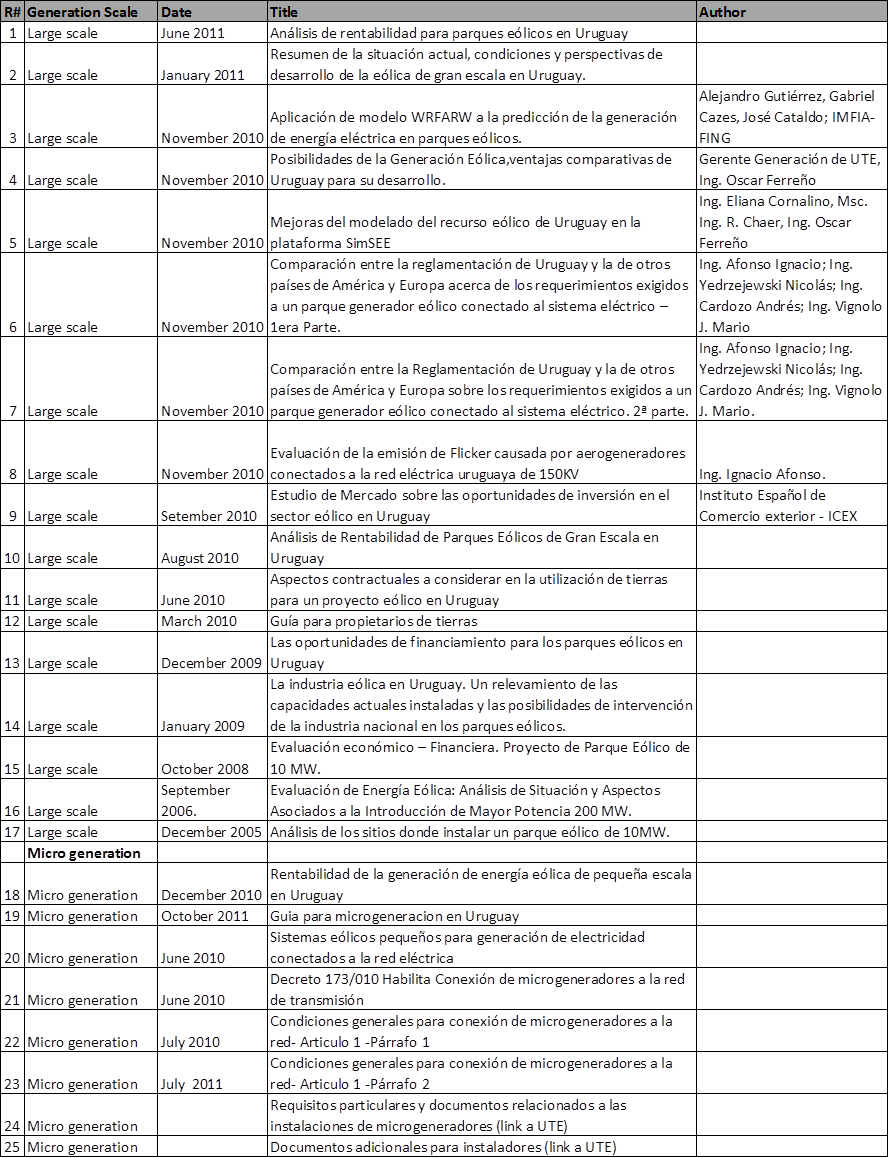
Table 3-19 shows a sample of studies and publications by UWEP. These cover a variety of topics related to the generation of large-scale wind farms and micro-generation. In particular, At large-scale, analysis of sites to install wind farms (publication # 17), economic evaluations and profitability of wind farms (# 1, 10 and 15), investment and financing opportunities (# 13, 9), wind energy development prospects in Uruguay (# 2.4), regulatory issues (# 6.7), technical issues (# 3,5 and 8), land use (# 11 and 12),and national capabilities (# 14, 16), among other.

As regards Outcome 2.3, the creation of knowledge and awareness about wind energy opportunities between relevant stakeholders and society in general, one of the most significant contributions of the project was to have acted as a facilitator and catalyst for the creation of the Uruguayan Association of Wind Energy (AUdEE)[[48]](#footnote-49).AUdEE is a civil association that is dedicated to promoting, group companies or people, and to support the use of wind energy in the country. Created in 2009, this association is a discussion forum for individuals from different stakeholders (government agencies, private companies and individuals).

As for the creation of knowledge and awareness among the general public, although no program was planned with this purpose, along with UDELAR, UWEP conducted various activities which included a public presentation of the Wind Map, which turned out to be a significant diffusion tool to inform the public and private stakeholders about potential of the wind resource nationwide. UWEP also participated in the workshop "Myths, Realities and Perspectives of Wind Energy in Uruguay" organized by the Municipality of Maldonado and UWEP on April 21, 2010, attended by inhabitants of the Department of Maldonado and especially by owners of land sites.

Concerning diffusion activities of UWEP and its outcomes using newspapers, radio and TV, a detailed report of such activities was not found, but it is known that information was made available to the news media.

Table3‑19. UWEP Publications



UWEP developed an excellent web site *[[49]](#footnote-50)*where information is classified in the following categories: institutional, policy, large-scale wind, micro-generation, wind resources, events, links, reports and contacts. There are 25 papers in total. Good practices documents are:

* Guide for micro-generation in Uruguay. UWEP-DNE. (November - 2010). Montevideo
* Small wind systems for the generation of electricity connected to the network (p. 64 to 67). Construction Guide (2010)
* Small Wind Systems for grid-tied electricity generation. A guide for Uruguay (June 2010)
* Overview of the wind energy development - Highlights for an investment project - Chapter 1. UWEP - DNE (November 2011) Montevideo
* Development, operation and maintenance of a wind farm - Chapter II. UWEP - DNE (November 2011). Montevideo

Therefore this result is fully satisfactory.

In relation to Outcome 2.4, Execution of a UNDP/GEF monitoring and evaluation component, monitoring activities have been in accordance with the M & E plan guidelines respecting the UNDP / GEF procedures. The medium-term evaluation was not performed because the selected consultant did not have time to do it promptly. Instead this evaluation, there was a mission to support the Project Management Unit. The mission´s report presents observations on the participation of private actors in the generation in Uruguay, their interests against those of UTE, the need for training of UTE to strengthen its position in dialogues and negotiations with the private sector, the limitations on the participation of the domestic industry in projects given the high standards of quality of the equipment imposed by the project developers, sector planning regarding new developments and UTE contracting modalities with respect to the future maintenance of its wind farms..

From a project management perspective, the support mission made observations on human resources. It also recommended that the current configuration of the Management Unit (coordinator, economist and manager) along with two engineers in the Generation Unit of UTE should be changed. The idea was that DNE should seek the economist (as well as restoring the position of Project Director temporarily suppressed by internal reforms in DNE) and an engineer was placed in the UTE Planning Unit. The placement of the engineer in the UTE Planning Unit was never made effected.

The Project Final Evaluation is this report conducted by an independent consultant.

The evaluator considers the achievements of Outcome 2 as ***Highly Satisfactory (HS).***

### Outcome 3: Increased business skills have been developed to prepare and implement wind energy technology within the public and private delivery model.

Table 3‑20. Outcome 3. Indicators and sources of verification

| **R#** | **Project Strategy** | **Objectively verifiable indicators** | **Sources of verification** |
| --- | --- | --- | --- |
| **3-0** | **OUTCOME 3**  **Increase business skills have been developed to prepare and implement wind energy technology within the public and private delivery model.** | * Public target institutions (DNE and UTE) strengthened with 4 people; * Continuation by DNE and UTE to continue wind activities and staff after finalizing the project; * Increased capacity and impetus for wind farm development among private parties (companies, investors) in Uruguay; * Local companies becoming involved in wind energy industry. | * Records of staff within target institutions involved in wind energy; * Existence of procedures to prepare, assess and execute wind energy within institutions; * Feasibility studies, bidding calls etc. published by institutions; * Value of wind project portfolio built up by public and private stakeholders. |
| 3.1 | * Enabling of the public delivery model by strengthening the skills within DNE and UTE for wind energy development. | * Effective training and transfer of knowledge on wind energy within target institutions; * Anticipated number of staff (4 people) added to DNE and UTE by the project. | * Records of people hired by the project; * Development of procedures to prepare, assess and execute wind energy within institutions; * Records of project training and awareness raising activities. |
| 3.2 | * Preparation of the private delivery model by creating capacity among identified private actors. | * Increased number of institutions and personnel that has become actively involved in wind energy development, lending, supply, etc.; * Increased capacity of private stakeholders to develop wind energy; * Number of capacity building activities carried out by the project among local companies. | * Records of project training and awareness raising activities; * Value of wind project portfolio built up by private stakeholders. * Other verifiable activities on wind energy performed by third parties. |
| 3.3 | * Capacity building among local companies interested in entering the wind energy market. | * Investment and contracts by local companies related to wind energy in Uruguay, Mercosur or world-wide; * Increased number of people employed by domestic companies related to wind energy; * Prospects of national companies interested to become active in wind energy sector. | * Inquiries and audits of companies; * Inquiries of local companies, statistics from Chamber of Industry; * Records of capacity building activities carried out by the project. |

For its Outcome 3.1, UWEP has contributed decisively to the development and strengthening of capacity in both the DNE and UTE. The UWEP first of all, had a seat in the DNE and had the Project Coordinator, an economist and an assistant as full-time staff. UWEP also hired qualified staff depending on project needs. Furthermore, in compliance with the commitments with UTE under the PRODOC, UWEP financed with program resources two engineers who remained in UTE in the Generation Unit during the execution of the project and they have been later absorbed by UTE. On the other hand, the staff improved their skills through workshops, events and courses in UDELAR.

In terms of capacity building for the private sector, the project developed capacity building activities both on its own and in partnership with other institutions. As relates to Outcome 3.2, during the execution of the project a database with a record of 177 stakeholders interested in wind power was developed. The Figure 3‑8 shows the number of records for each type of activity (it should be noted that the same stakeholder can have multiple activities). Most of the actors are interested in providing services, project development and industrial stakeholders in the supply of parts and components. Among the stakeholders there are both domestic and foreign companies.

UWEP also conducted events and / or participated in them. Table 3‑21 has recorded 16 events of various kinds designed to inform the development of UWEP, strengthen the capacities of different actors, specific training on topics related to technology, promotional aspects as tax benefits and regional integration with Mercosur countries, among others.

The first workshop was conducted by UWEP in April 2009, called "First Encounter between Stakeholders of Uruguay Wind Power: Opportunities in Development". The workshop was organized by the Chamber of Industry of Uruguay and the DNE. It covered regulatory and strategic commercial themes for the sector in Uruguay, associative and financial and technological aspects. The event was attended by 43 stakeholders from different sectors. It involved 131 actors between developers, utilities, industry representatives, international investors and service industry representatives, from Argentina, Brazil, USA, Spain, Italy and Uruguay.

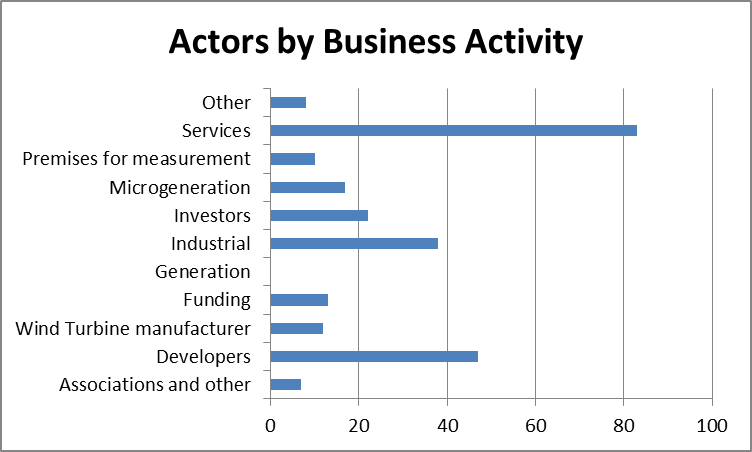
The remaining workshops disseminate valuable information for the projects, present outlines of policy and strategy, discuss operational aspects of large-scale wind generation, technical training, among others. UWEP also participated in the workshop "Productive integration of the wind industry in Mercosur" organized by the Productive Integration Group (GIP) on April 23, 2010, with the participation of the industrial sector of the region.

In association with UDELAR, a Wind Measurement and Micro-localization Course was held in the Ministry of Industry, Energy and Mining aimed at technicians of companies that work on issues related to wind energy.

It is important to note that capacity development was mainly aimed at the institutional level (DNE, the UTE, ADME and URSEA). In addition, the incentive of calls for bids also promoted activities between private sector actors- Two examples are the event related to wind energy with participation of the German Commerce Chamber. Advance WindPro software courses were also carried out. In the case of micro-generation, the courses were assumed by UWEP because the scale of the projects did not encourage the private sector to promote its realization.

UWEP also conducted events and / or participated in them. Table 3‑21 has recorded 16 events of various kinds designed to inform the development of UWEP, strengthen the capacities of different actors, specific training on topics related to technology, promotional aspects as tax benefits and regional integration with Mercosur countries, among others.

Figure 3‑8.Actors by business activity

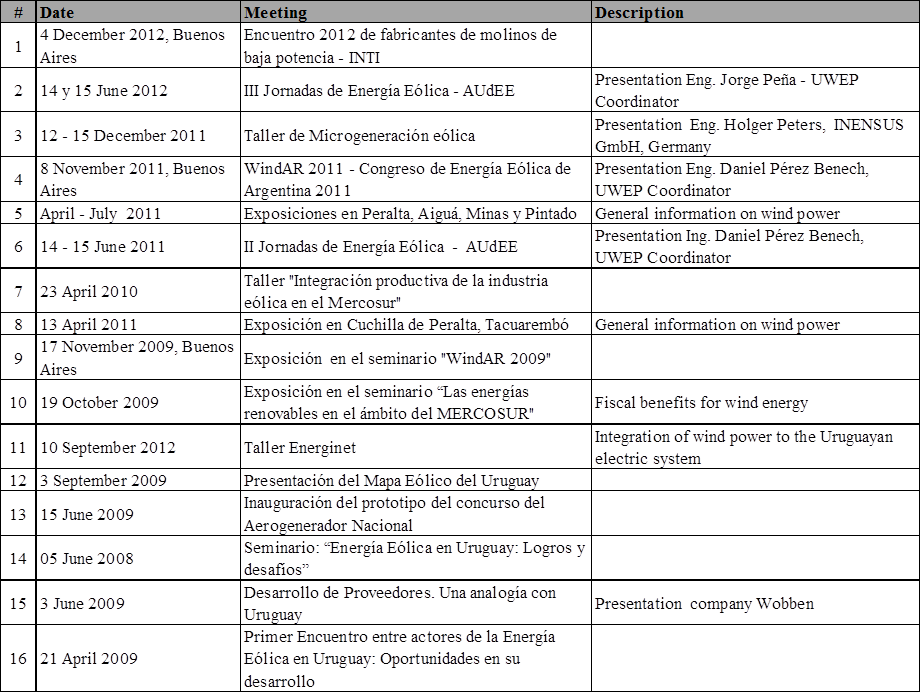


Source: From information UWEP

Regarding capacity building in companies interested in wind power, Outcome 3.3, there are currently in Uruguay 177 stakeholders participating in the development of wind energy. It should be noted that at the beginning of the project, in 2007, the core of actors were professors and researchers of UDELAR and several officials of the DNE and UTE. This shows an explosion of actors in a period of five years, which have established the AUdEE. In terms of capacity building, the AUdEE organized with the support of UWEP a series of events such as:

* Third. Wind Energy Conference - 14 and June 15, 2012
* Workshop "Public and Private Actors building together the Wind" - December 13, 2011
* 2nd. Wind Energy Conference - 14 and June 15, 2011
* Wind Day Celebration - June 15, 2010
* 1st. Conference on Wind Energy Associations Uruguay - Brazil - 3 and November 4, 2009

Table 3‑21. UWEP participation in events



Source:[http://www.energiaeolica.gub.uy/index.php?page=informacion-institucional-del-UWEP](http://www.energiaeolica.gub.uy/index.php?page=informacion-institucional-del-peeu)

At bi-national level, UWEP promoted contacts between industry representatives of Uruguay and Brazil to encourage productive integration. Contacts are established and they are expected to become effective during the development of wind power industry in Uruguay.

Mercosur was also subject of UWEP attention. They interacted with the Productive Integration Group seeking to integrate the potentialities of the countries of the agreement. Despite efforts made by the UWEP no major institutional integration was accomplished.

As regards the number of people employed by local companies on wind power there is no explicit information on the subject but from stakeholder information it can be estimated that approx. a hundred people were directly involved and an unknown number of indirect participants. It is also known from the interview with the Director of the DNE that in 2013 there is a study to determine the impact that the development of wind power has had in terms of investment and employment, among others.

The evaluator considers this result as ***Satisfactory (S).***

### Outcome 4: Technological barriers have been removed by facilitating measuring equipment and implementing a first 5-MW wind farm connected to the grid. .

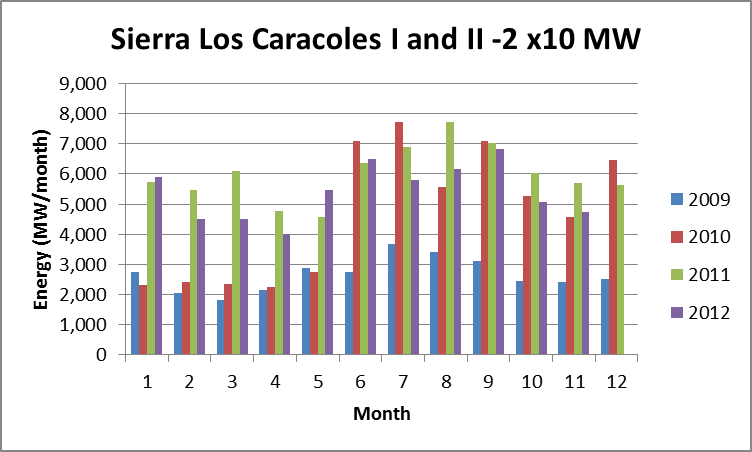
In relation to Outcome 4.1, UWEP purchased seven measurement stations, of which four were installed and have already completed nearly three years of operation. An information management system currently operated by UTE was also designed and implemented. The system comprises the information from over 20 stations[[50]](#footnote-51) (See section 3.3.3).Recently (as of December 2012), an agreement between the DNE and AUdEE was established for the donation to AUdEE of the three remaining measurement stations for conducting measurement campaigns for wind power micro-generation projects[[51]](#footnote-52).

Table 3‑22.Outcome 4.Original and revised Indicators and targets

| **R#** | **Project Strategy** | **Objectively verifiable indicators** | **Sources of verification** |
| --- | --- | --- | --- |
| **4.0** | **OUTCOME 4**  **Technological barriers have been removed by facilitating measuring equipment and implementing a first 5-MW wind farm connected to the grid.** | * Wind measuring equipment operational; * One 5 MW wind project externally financed, built and operational. | * Physical existence of equipment; tender documents; * Existence of first wind farm in Uruguay. |
| 4.1 | * The procurement and installation of wind measuring equipment and a data management system for consultation and data analysis. | * Installation of minimally six (6) lower and two (2) higher measuring posts at suitable locations and 3-yr ongoing data collection; * Design and installation of data management system. | * Physical existence of measuring systems in place; * Physical verification of data management system in place. |
| 4.2 | * Investment in a 5 MW wind farm (externally funded). | * Investment in 5 MW wind farm placed and wind farm constructed; * Annual energy production and CO2-savings from the installed wind farm. | * 5 MW wind farm installed and operational; * Records of delivered electric energy. |

In the development of a 5 MW wind power plant, Outcome 4.2, UTE developed in the Sierra de Los Caracoles a 2x10 MW park in two stages (December 2008, June 2010). The Figure 3‑9 shows the annual generation of the park where there are two periods of generation: Before June 2010, when only 10 MW were operating and after June 2010 when it expanded to 20 MW.

Figure 3‑9. Sierra Los Caracoles wind farm (2x10 MW).



Source: Compiled from information of UTE

The generation of the park Los Caracoles in 2009 was 31958 MWh, which corresponds to 76.8% of UTE´s total wind generation (Table3‑23). The remaining 33.2% was purchased from private wind generators. The participation of private generators has been increasing and UTE generation was 58.4% in 2012. The capacity factor of Los Caracoles in the last 4 years is on average 38.7%. Emission reductions of UTE´s wind generation is for the last four years 0.194 MtCO2.

Table3‑23. Generation of Los Caracoles I and II



Source: Compiled from information from the UTE

It is considered that the Outcome 4 is ***Highly Satisfactory (HS).***

## Current project status

On March 2013, the project has yet to execute and with a deadline of June 30, 2013:

* Full inventory of goods and services financed by the GEF
* Financial audit (2012 – 2013)
* Transfer of property to the DNE (non-fungible) acquired with UWEP resources, in particular measuring stations, software packages and purchased library materials (standards)
* The development of a final report by the UWEP although not mandatory according to PRODOC is recommended.
* General systematization of Project Lessons Learned
* Closing Event: Presentation of results of the final evaluation and lessons learned with the UWEP

Annex 6.7.5established the number of actions required to close the project.

## Current Status of the barriers

The barriers identified in the PRODOC, after a thorough analysis, were classified into the following four categories: Policies, Capacities and Business Models, Information and Technology. The project strategy designed outputs to remove each of the categories of barriers. It is convenient to keep in mind that two basic conditions had already been established in order to allow the removal of the barriers identified in Uruguay:

* 1. The recognition by the Government of Uruguay (GoU represented by MIEM and UTE) of the need to check the reference cost of wind energy, allowing for an extension of UTE´s mandate.
  2. Political will of the GoU to accept and facilitate the participation of private electric generators in the electricity sector.

This meant a breakthrough for the introduction of decentralized Renewable Energy Sources (including wind power) in the national electricity system.

The evaluator considers that after executing this project, the current status of the barriers is as given in Table 3‑24.

Table 3‑24. Effect of the project on barriers

| **TYPE OF BARRIER** | **STATE OF THE BARRIER BEFORE THE PROJECT** | **STATE OF THE BARRIER AFTER THE PROJECT** |
| --- | --- | --- |
| *Political and regulatory* | * + Insufficient, and / or inappropriate transparent regulations to install and operate wind turbines connected to the grid, including grid network access and preferential dispatch.   + Lack of an enabling policy framework that allows third parties to embark on wind energy investments, for example under PPA with the national company UTE.   + Low development of technical standards, building and electrical codes, and environmental guidelines for wind energy systems.   + Unattractive investment return on wind projects selling electricity to the grid and as a result, lack of interest among investors and developers to invest in wind energy.   + Lack of long-term financial incentives to be paid by wind generated electricity, based on an assessment of the benefits to the economy and national society. | * Currently there is a legal and regulatory framework available for enabling installation and operation of wind turbines connected to the grid and with preferential dispatch. * There are various kinds of contracts signed between the UTE and wind generation developers. * There are in UTE, technical standards, building codes and electrical codes for wind generation. *Environmental guidelines for wind energy systems still need to be strengthened.* * There are contracts between UTE and private investors indicating appropriate return for investors * The development scheme does not include subsidies for wind power.   ***The regulatory political barrier was almost completely removed (it still requires further strengthening of environmental guidelines) and there is an appropriate environment for adjustments as the development of wind energy in the country continues.*** |
| *Capabilities and business models* | * + Insufficient capacity and skills between public sector stakeholders (DNE and UTE) and private sector investments to implement wind energy in Uruguay.   + Lack of mandate within UTE to promote and deploy wind energy systems.   + Limited understanding on the implementation and operation of wind technology in Uruguay | * DNE and UTE, Governmental institutions, and private sector have developed capacities to implement wind energy investments. * UTE has a clear mandate to promote and install wind power systems with different types of contracts * There is a good understanding by the DNE, UTE, investors and wind energy developers in Uruguay on the implementation and operation of wind technology.   ***The barrier of capabilities and business models has been removed.*** |
| *Information* | * + Insufficient detailed information related to the wind potential in Uruguay.   + Lack of incoming information to develop a first batch of commercial wind farms | * There is a wind information system in operation which has given enough information about the wind potential to current developments. * This has allowed the development of a total of 43.45 MW of wind power until December 2012, of this 20MW of which were developed directly by the UTE. * By 2015, close to 990 MW of wind power will be installed.   ***The information barrier has been removed.*** |
| *Technology* | * + Lack of financial resources and technical equipment to gather information on winds and to make them available to interested parties on future investments.   + Lack of successful large-scale project wind energy in Uruguay. | * Governmental institutions DNE and UTE, and private investors have developed capacities to implement wind energy investments. * UTE has a clear mandate to promote and install wind power systems with different types of contracts * There is a good understanding by the DNE, UTE, investors and therefore wind energy developers in Uruguay on the implementation and operation of wind technology.   ***The technology barrier has been removed.*** |

# CONCLUSIONS AND RECOMMENDATIONS

This chapter aims to establish project findings and recommendations to the executing agency and UNDP.

**DNE**

Conclusions

* ***The UWEP has contributed significantly to positioning and developing wind power as a renewable energy source for electricity generation in Uruguay.***
* Establishing a long-term energy policy with a comprehensive and multidimensional character considering technological, economic, geopolitical, environmental, social and ethical aspects, and including renewable energy (solar, wind, small hydro and biomass) and energy efficiency in an environmentally and economically sustainable manner, is an extraordinary achievement that has been a key factor for the successful establishment of an enabling legal and regulatory framework for the introduction of wind power generation in the country.

* A second success factor has been the ¨country's image¨ which established that the country risk for private investors is low, result of UTE´s long tradition of honoring its commitments (AAA-rated Company), transparency by using a business model without subsidies, and the opening and appropriate business environment for private investors.
* The use of wind energy is in line with the country´s energy, social, labor and environmental policy.

Recommendations

* To ensure sustainability of the wind power systems it is recommended to strengthen the capacity of stakeholders, in which UDELAR through its GTER should play a major role.
* The know-how and expertise gained by the actors in Uruguay is a potential source of supply of goods and services to the countries of the region.

*The following recommendations should be implemented before the execution deadline on June 31, 2013 and its implementation should be reported in the Final Report of UWEP.*

* Document all agreements made with beneficiaries, duly signed.
* Attach the inventory of equipment and services received by the UWEP, auditing records and reception of studies, and collect the installed equipment warranties.
* Formalize (legalize) the transfer of goods and services delivered to the beneficiaries, according to UNDP procedures
* Prepare the Final Report of the project.
* Carry out the UWEP Closing Event in partnership with UNDP / GEF including presentation of results and the final evaluation.

**UNDP**

Conclusions

* The success of this project is the result of successful identification of barriers and planning, the proper implementation of the project strategy and selection of the executor, institutional arrangements and the support of UNDP.
* Furthermore, the project had the advantage of having a long term state energy policy term in which wind energy was a major player.
* The project not only removed the barriers but the outcomes and actions of the stakeholders aim to change the country's energy matrix with strong participation of wind power.
* The UWEP has empowered local stakeholders through capacity building and promoting their organization.
* It has been demonstrated once again the importance of Medium Term Assessments, replaced this time by a technical assistance as a means to redirect the course of the projects.

Recommendations

* The information generated, evaluated experiences and lessons learned in the UNDP / GEF projects should be shared across a knowledge and information platform. The countries of the region have much to learn from UWEP.

# LESSONS LEARNED

* 3 years, as initially proposed to run a program that expects to remove barriers at national level, as was intended in the design, is a short time, especially considering that some of the expected outcomes required the participation of different stakeholders.
* The project started at a peculiar moment in which the project beneficiary nation had established a long-term energy policy including renewable energy, in such a way that the project was facilitator and catalyst for action that led to the success of project.
* The implementation strategy of the project was very successful in including as the project participants DNE with the strong backing of the UTE, linking the planning sector, and the generation and supply sectors
* Another element of the strategy that has been a success factor was to include a core of specialists in wind power generation unit of UTE, funded by the UWEP, with the commitment of UTE of absorb them at the end of the project. This strategy was considered in the PRODOC as preferable to the direct support to the private sector, and proved to be valid.
* The response of the UTE to the generation and co-financing of the project has been unique in that it installed four times its generation capacity commitments and invested sevenfold the investment commitments established in PRODOC. This positive response of UTE to wind energy is not only derived from the commitment to the implementation of the long term energy strategy but also has strong roots in all the basic knowledge and the potential wind resources derived from the activity of GTER of UDELAR with the facilitation and catalytic action of the UWEP.
* The development of wind energy in Uruguay has already acquired its own dynamic, but the issue of the introduction of hybrid wind power systems for the rural sector is still to be resolved. This technology plays an important role in the goal of a fully electrified Uruguay by 2015. There is here also open the opportunity for new cooperation projects.

# ANNEXES

## TERMS OF REFERENCE

INTRODUCTION

UNDP / GEF Policy monitoring and evaluation (M & E)

UNDP / GEF Policy for project monitoring and evaluation (M & E) has four objectives:

* Monitor and evaluate results and impacts;
* Provide inputs for decision-making and making necessary amendments and improvements;
* Promote accountability in the use of resources;
* Document, provide feedback and disseminate lessons learned.

To ensure the effectiveness of the of projects M & E, a set of tools applicable continuously over the life of the project is used, e.g. periodic monitoring of indicators, midterm evaluations, audit reports and final evaluations.

In accordance with the policies and UNDP / GEF M & E procedures, all projects funded by GEF should make a final assessment near the end of its implementation. Final evaluations provide a comprehensive and systematic explanation of the performance at the end of the project cycle. Considering the entire effort, from project design to implementation and completion and also taking into account the probability of sustainability and potential impacts.

**Objectives of the project and its context**

The aim of the project is the exploitation of renewable energy resources, in the use of wind energy for electricity generation, contributing to environmentally sustainable development. The activities proposed in this project aim to remove barriers to the installation of wind power in electricity generation in Uruguay, including barriers in the regulatory, institutional, financial, technological and social arenas. The outcomes associated with the project are:

**Outcome 1:** Development of a policy and regulatory framework for wind energy in Uruguay

**Outcome 2:** The information to facilitate development of wind power projects identified.

**Outcome 3:** Increase business skills to prepare and implement wind energy technologies in the public and private sectors.

**Outcome 4:** Removal of technological barriers through the installation of measurement equipment and the installation of a 5MW plant connected to the grid.

**OBJECTIVES OF THE EVALUATION**

The final evaluation is intended to provide a review of the progress of implementation, review project achievements in the realization of their outputs and determine progress toward achieving the goal and expected outcomes of the project and lessons learned.

In this context, the purpose of this consultancy is to assess the fulfillment of the objectives and outputs of the project, at the end of the implementation period, in relation to Detailed Work Plan and the respective Annual Work Plans approved by UNDP.

Final evaluations have also the following additional purposes:

* Promote accountability and transparency, assess and reveal the progress towards meeting project achievements.
* Identify key lessons learned that can be spread between GEF and relevant projects that may help improve the selection, design and implementation of future UNDP / GEF initiatives.
* Provide feedback and comments on key issues recurring in the portfolio that need attention and improvements on key issues.

The main actors of this evaluation are: the project team, the National Directorate of Energy, Ministry of Industry, Energy and Mining (MIEM), the power company State (UTE) and UNDP. The intended beneficiaries of the UWEP initiative are, apart from the global environment, the domestic economy and Uruguayan society, which are represented in the context of the society and by the government of Uruguay, environmental institutions, national power industry, components and generation companies and organized civil society and society in general.

Please refer to Section 7 for details regarding the scope of this evaluation.

**EVALUATION EXPECTED OUTPUTS**

The evaluator is expected to deliver the following outputs:

Oral presentation of the main findings of the evaluation: this must be presented at the UNDP Country Office before the evaluation mission is completed, this will verify, validate and clarify the findings of the evaluation.

Assessment Report: This report must be sent electronically to the UNDP Country Office (CO according to its acronym in English), to the Regional Office for the Coordination of UNDP-GEF (RCU, according to its acronym in English) and to the project team no later greater at 2 weeks after completion of the mission. The parties will review the document and deliver remarks and / or comments to the project team by no later than 1 month after the report is delivered. The evaluator/swill considers the comments to be included in a final report to be delivered no later than one week after delivered the comments. In case any discrepancies between the impressions and findings of the evaluation team and the parties mentioned above, an annex at the end of the document should be included explaining these discrepancies. The Regional Coordination Unit of UNDP-GEF and the UNDP Country Office will sign a final form of the document approval that will be attached to the final report (see Appendix 4). The evaluation report structure is described in Section 7.

General considerations of the report:

* Format: Times New Roman - 11; single spacing; automated table of contents, number of pages (centered below) suggest the use of graphics and photographs, where relevant
* Length: Up to 50 pages in total, excluding annexes
* Delivery dates: First draft within a period not exceeding two weeks after completion of the mission

**EVALUATION METHODOLOGY**

This section provides a summary of the assessment approach or methodology. However, it should be clear that the evaluator must review it if necessary. Any changes must be in line with international standards, norms and standards for professionals adopted by the United Nations Evaluation Group. Any changes must be supported by the UNDP Country Office before being implemented.

1. **Document Review:** The list of documents reviewed is included in Appendix 1. All documents will be provided to the evaluation team by the UNDP Country Office and the Project Team. The project team and the UNDP Country Office will prepare a note for each document that describes its corresponding importance and the key sections where the evaluator must pay special attention. The evaluator should consult all relevant sources of information including among others: The evaluation policy of UNDP and GEF, the project document, minutes and decisions of the steering committee, project budget, operational and work plans, reports progress, PIRs, project files, documents UNDP guidelines, national legislation relevant to the project and any other material that may be useful. The project coordinator will also provide a report with the main lessons and progress of the project.
2. **Interviews:** the evaluator conducted interviews with the following institutions and individuals, as a minimum: project team, UNDP Programme Officer, the Director of Energy, UTE staff, University of the Republic, and other relevant groups.
3. **Views:** The consultant will visit the stakeholders required; e.g., UTE, UDELAR, etc. The consultancy does not include field trips out of town.
4. **Semi-structured interviews:** The evaluator should develop a process to conduct semi-structured interviews to ensure that all issues are covered. Group discussions (Focus groups) with the beneficiaries of the project will be carried out when necessary.
5. **Questionnaires**
6. **Participatory techniques and other approach for collecting and analyzing data, if necessary**

**EVALUATION TEAM**

There will be a single evaluator for the Final Evaluation of Uruguay Wind Energy Programme, with knowledge and experience in the area of ​​wind energy. In particular, it is expected that the consultant meets the following requirements:

1. Professional graduate degree with related materials
2. Knowledge of the policies and procedures of UNDP - GEF in the area of ​​climate change.
3. Experience in project management and monitoring and evaluation of UNDP-GEF projects
4. Experience related to wind energy
5. Excellent language skills English and Spanish will be necessary.

The evaluators must be independent from the generation of management policies and assistance. Therefore, applications from evaluators who have had any direct involvement with the development or implementation of the project will not be considered. Any previous association with the project, relevant government counterparts, the Uruguay UNDP Offices or other players must be mentioned in the application.

If the / the evaluators / as selected had not mentioned these links, this will be grounds for immediate termination of the contract. In such circumstances, reports and other documentation produced by the evaluators will be retained by UNDP.

**ARRANGEMENTS FOR IMPLEMENTING THE EVALUATION**

**Management Arrangements**

The evaluation was requested by UNDP, led by the UNDP country office in Uruguay, as Project Implementation Agency. The UNDP Country Office has the overall coordination and logistical responsibility for the evaluation arrangements as well as to give necessary support to the evaluator (travel, accommodation, work space, communications, etc.) with the timely delivery of per diem and contract payments. The UNDP Country Office will organize a mission to the site (travel arrangements, meetings with key stakeholders and beneficiaries, interviews and field visits). The evaluator will receive a brief oral summary from the Country Office and the RCU, at the beginning of the mission. The Evaluator is expected to also deliver an oral summary of preliminary findings and conclusions of the assessment mission to CO and RCU. If it is necessary, further discussions with the CO and RCU about the mission and the project can be coordinated while the evaluation is performed.

These terms of reference are based on UNDP-GEF policies and procedures and have been agreed, as well as the agenda of the mission, between UNDP-CO, UNDP-GEF-RCU and the project team. The final report must have been accepted and approved by UNDP before being used publicly. For this, the UNDP-CO and UNDP-GEF-RCU must formally approve the report (see Appendix 4).

**Main activities and deadlines**

The total duration of the evaluation will be 17 (seventeen) days according to the plan presented in the Terms of Reference for the consultancy.

**FINAL EVALUATION SCOPE OF GEF PROJECTS[[52]](#footnote-53) AND SPECIFIC ISSUES TO BE COVERED**

**7.1 General**

The final evaluation will assess, at least, progress towards achieving outputs and outcomes. In this sense, the evaluation should assess the extent to which the results of the project have been achieved, or are expected to be achieved, and assess if the project has had, so far, any other positive or negative result.

While assessing the progress of a project, the final evaluation is to identify lessons learned and gaps in the process of achieving the goal of the project as stated in the project document and also indicate whether there were any changes and whether these changes were approved and made.

Overall, the final evaluation should address the following issues and questions related to the project:

**Project design:** How current and valid is the design of the project since its original development, and whether its contribution can be identified to reach the objectives set or not?

**Impact:** Does the project achieve satisfactory progress toward the expected impact? How have leading indicators evolved?

**Indicators:** Do the indicators reflect the overall objectives of the project? Have baseline measurements been taken at areas where pilot experiences are being developed?

**Implementation and execution:** Have implementation and execution modalities operated in an efficient and effective manner? Was there a clear division of roles and responsibilities between all stakeholders in the project? Was there effective communication between all groups involved? What were the strengths and weaknesses? Were administration costs reasonable? How was the delivery of the co-financing contributions (regarding the delivery schedule, amounts, exchange rates, etc. - Special emphasis should be given to this issue)?

**Lessons learned:** For example, how could impacts / results have been achieved more efficiently and effectively? What has worked particularly well and can be considered "best practice"? What should not have been done because it had little or negative impact on the overall objective?

The evaluation should examine and evaluate properly the various stakeholders’ perspectives. In most cases, a final evaluation includes field visits to verify the progress in achieving the objectives and outputs of the project and interviews with key national and local level stakeholders, where appropriate. It should also analyze the use of GEF resources and co-financing in the broader context of the country.

**Evaluation of progress towards the achievement of project results**

If the project did not establish a baseline (initial conditions), the evaluation team made up of an international consultant and a national consultant, in conjunction with the project team must calculate the initial conditions (baseline) so that the achievements and outputs can be properly identified. The outcomes are the effect, in the short or medium term, probable or achieved out of the intervention outputs. Examples of outcomes include, among others, strengthening institutional capacity, an increase in the levels of public awareness (when generating behavioral changes), and transformation of policy and market frameworks. As part of the evaluation, the evaluation team will have to quantify project results using relevant indicators and Tracking Tools (Tracking Tools)*[[53]](#footnote-54)*.

To determine the level of achievement of project outcomes and provide a basis for discussion, the following three criteria should be evaluated:

* **Relevance:** Are the outcomes of the project consistent with the focal areas / operational program strategies and country priorities? The assessment should also measure the extent to which the outcomes specified in the project document are actually outcomes and not outputs or inputs.
* **Effectiveness:** The probability of achieving the objectives. Are the project outcomes proportional to the expected outcomes (as are described in the project document) and the problems that the project was intended to address?
* **Efficiency:** The extent to which the outcomes are being achieved with the most economical resource potential (also called cost effectiveness or efficiency). Was the project cost effective? Did the project have the minimal cost option? Was implementation of the project delayed, and if so, did that affect cost-effectiveness? Where possible, the evaluation should also compare the project cost-time relation vs. outcomes, with other similar projects.

The relevance, effectiveness and efficiency evaluation should be as objective as possible and include sufficient and convincing empirical evidence. Ideally the project monitoring system should deliver quantifiable information leading to a robust assessment of the effectiveness and efficiency of the project.

In addition to a descriptive analysis, the evaluation should describe the project using the following categories:

* **Highly Satisfactory (HS):** The project had no shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
* **Satisfactory (S):** The project had minor shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
* **Moderately Satisfactory (MS):** The project had moderate shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
* **Moderately Unsatisfactory (MU):** The project had significant shortcomings in the achievement of its objectives, in terms of relevance, effectiveness and efficiency.
* **Unsatisfactory (U):** The project had major shortcomings in the achievement of its objectives, in terms of relevance, effectiveness and efficiency.
* **Highly Unsatisfactory (HU):** The project had severe shortcomings in the achievement of its objectives, in terms of relevance, effectiveness and efficiency.

**Approach to sustainability of project outcomes**

Although by project completion evaluation of "probability of outcomes sustainability and the provision of a classification" is not intended, the evaluation should offer clues for the analysis of the sustainability horizon at the end of the project. To do this, special attention should be paid to the analysis of risks likely to affect the continuance of project outcomes.

**Catalyst role**

The evaluation will also describe any catalytic or replication effect of the project that can be identified. If no effect is identified, the evaluation will describe the catalytic or replication actions that the project has made.

**Assessment monitoring and evaluation systems**

The evaluation will assess whether the project met the design requirements established for monitoring and evaluation (M & E) and whether the M & E implementation plan for the project was carried out. Specifically, it shall analyze the relevance, feasibility, accuracy, consistency and temporal disaggregation of indicators, and assess the relevance, feasibility and application of the tools provided in the monitoring and evaluation system. GEF projects must plan budget adequately for execution of the M & E, and provide adequate resources for the implementation of a M & E plan It is also expected that project managers use the information generated by the M & E system during project implementation to improve and adapt the project. Due to the long duration of many GEF projects it is also encouraged for projects to include plans for long-term monitoring to measure outcomes (such as environmental results) after completion. The report is expected to include separate assessments of the achievements and shortcomings of these two types of M & E systems.

**Special Issues to consider**

During the first interviews with the project team, government, counterparts and UNDP, in conjunction with UNDP, those issues that may be required further evaluation and care will be defined if necessary.

**Structure of the final report**

**1. Executive Summary**

* Brief description of project
* Context and purpose of the evaluation
* Main conclusions, recommendations and lessons learned
* Table summarizing ratings on this evaluation

**2. Introduction**

* Evaluation purpose
* Key issues addressed
* Evaluation methodology
* Evaluation structure

**3. The project and its development context**

* Onset and duration of project
* Problems that the project seeks to address
* Immediate and development objectives of the project
* Actors
* Expected Results

**Results and conclusions**

In addition to the effectiveness and efficiency evaluation described above, a descriptive analysis must be submitted. All criteria marked with (\*) must be rated using the following divisions of categories: Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U), Highly Unsatisfactory (AS ). Please see Appendix 2 for explanation of GEF terminology.

* 1. **Project Formulation**

The section should begin by describing the context of the problem the project is addressing. It should describe how efficient was the design and how the project was conceptualized to address the problem, emphasizing the consistency and logic of the project strategy and logical framework. This section should answer questions such as how well the project was formulated? Are the changes that were made during its execution, resulting in better outputs and (potentially) greater impacts? This section includes:

Conceptualization / Design (\*): This section should assess the approach used in the design and give an appreciation of how appropriately conceptualized the problem was and whether the selected intervention strategy was the best option to address barriers in the project area. It should also include an assessment of the logical framework and whether the various components and activities proposed to achieve the objective were appropriate, viable and responded to the institutional, legal and regulatory context of the project. It should also assess the indicators defined for guiding implementation and measurement of achievements and whether lessons from other relevant projects (in the same focal area) were incorporated into the project design.

* National ownership: the evaluation should assess whether the initial project idea originated in local, national or sectorial development plans and if the project meets the national interests in terms of the environment and development.

Stakeholder involvement (\*): the evaluation should assess whether there was dissemination of information, consultation and participation of stakeholders in the project design.

Replicability: the evaluation should determine how the lessons and experiences from the project were or can be replicated or scaled up in the design and implementation of other projects (this also relates to the practices undertaken during implementation).

Other aspects: revision in the project formulation approach of the comparative advantage of having UNDP as project implementing agency, the consideration of linkages between projects and other interventions within the sector and the definition of clear and appropriate arrangements of management at the stage of Design.

**4.2. Project Implementation**

* **Implementation Approach (\*):** Regardless of whether the project has been designed correctly, the next question to ask is if it has been well implemented? Among other factors, the following should be evaluated:
  + 1. The use of the logical framework as a management tool during implementation and any changes made to it in response to changing conditions and / or feedback from monitoring and evaluation activities.
    2. Other particular elements showing that adaptive management existed, such as the systematic development of work plans and realistic large and / or changes in management arrangements to enhance implementation.
    3. The establishment and use of electronic information technologies to support implementation, participation and monitoring, as well as other project activities.
    4. Operational relationships between the institutions involved and others and how these relationships have contributed to effective implementation and achievement of project objectives.
    5. Technical capacities associated with the project and their role in the development, management and project achievements.

**Monitoring and Evaluation (M & E) (\*):**the evaluation should include an assessment of whether there has been adequate periodic monitoring and implementation activities in order to establish whether the inputs, work, schedules, and outcomes have progressed according to plan. If there have been formal evaluations and assess whether actions have been taken following their results and conclusions. To assess this it is proposed that the evaluator uses the following criteria: i) assess whether there has been an M & E system that has allowed for properly tracking progress towards achieving the project outcomes and objective. ii) assess whether adequate M & E tools have been used such as baselines, practical and clear indicators, data analysis, studies to evaluate the outcomes for certain stages of the project (results or indicators of progress). iii) assess if there were the resources and capacity to conduct adequately monitoring and if the M & E system was used for the management / adaptive management of the project.

**Stakeholder Involvement (\*):** This should include an assessment of the mechanisms for the dissemination of information on project implementation and the extent of stakeholder participation in management, emphasizing the following aspects:

1. The production and dissemination of information generated by the project
2. The participation of local users and NGOs in project implementation and decision making. Analyzing the strengths and weaknesses of the approach adopted by the project in this topic.
3. The establishment of partnerships and cooperative relations between the project and local, national and international institutions and the effects they have had on project implementation.
4. The participation of governmental institutions in project implementation, the degree of government support to the project.

* **Financial Planning:** It should include an analysis of:
  1. actual project cost by objectives, outputs and activities.
  2. cost-effectiveness of the outcomes. Has the project been so far cost-effective?
  3. financial management (including disbursement issues)
  4. co-financing (see Annex 5 for information on the report of co-financing. This table must be completed and submitted in the evaluation document).

**Implementation and execution modalities:** This should consider the effectiveness of the UNDP counterpart and the participation of the Project Coordination Unit in the selection, recruitment, assignment of experts, consultants and national counterpart staff and the definition of tasks and responsibilities; the quantity, quality and timeliness of inputs to the project with respect to execution responsibilities; the enactment of legislation and budgetary provisions and extent to which these may have affected implementation and sustainability of the project. Also the quality and timeliness of inputs by UNDP and the Government, and if applicable, other partners responsible for providing resources to the project and the extent to which this has affected the implementation of the project. This section should seek to answer the following questions: *Did modality of project implementation and execution operated so far in an efficient and effective manner? Did effective communication with stakeholders critical to meet the needs of the implementation take place? Were administration costs reasonable?*

**4.3. Outcomes**

Achievement of outputs / outcomes and objectives (\*): This final evaluation seeks to determine the success achieved on the objective and outcome of the project and if there is any positive or negative impact. For this it is important to determine the successes and failures of the project to achieve its objective and results. If the project did not establish a baseline (initial conditions), the evaluators, along with the project team should try to determine it using special methodologies to successfully establish achievements, results and impacts. This analysis will be carried out based on specific project indicators. This section should also include an assessment of the following:

This section should also review the following aspects:

* **Sustainability:** Including an appreciation of how the project benefits continue, within or outside the project area after GEF assistance ends. Sustainability analysis of the results should give special attention to the risks that may affect the continuity of the results. Sustainability analysis should also explain how other contextual factors that affect project outcomes are sustainability. This analysis should be done based on the following four dimensions of sustainability. Furthermore, these dimensions should be classified with the categories described in the footnote*[[54]](#footnote-55)*:
  + Financial Resources: Are there any financial risks that could affect the sustainability of the initiative? What is the probability that there are no financial resources to sustain the project results after GEF support is finished? (Resources can be from various sources such as public and private sectors, income generating activities, and trends indicate that in the future there may be adequate funding to sustain the project results).
  + Socio-Politics: Are there any social or political risks that may jeopardize the continuity of the project results? Is there any risk that the appropriation of the stakeholders is insufficient to ensure the continuation of benefits and outcomes? Do key project stakeholders seem interested that the benefits of the project continue? Has there been increased awareness among the public and stakeholders to continue their support to the project objective in the long term?
  + Institutional framework and governance: Does the institutional and governance framework pose a risk to the benefits of the project? It must also be considered whether the systems for accountability and transparency, and the ability (expertise) are suitable and available to continue the initiative.
  + Environmental: Are there any environmental risk or activities in the project area that can reduce the future flow of project environmental benefits? The final evaluation should assess whether some project activities may exert some kind of threat to the sustainability of project outcomes. For example, the construction of a dam in a protected area could inundate a large area and thus neutralize the biodiversity benefits achieved by the project.
* **Contribution to improving the skills of national / local staff.**

**Conclusions and recommendations**

This section should give the main points or findings of the evaluation and the specific recommendations. Recommendations should be specific indicating to whom they are addressed. Please fill in the relevant columns of the table in Annex 4 with the main recommendations. This section must contain:

* Final comments and syntheses on the relevance, effectiveness, efficiency, and sustainability of the project results;
* Final comments on the degree of progress of the project results and purpose.
* Corrective actions for the design, implementation, monitoring and evaluation;
* Follow-up actions to reinforce the initial benefits of the project;
* Proposals for future directions to strengthen the achievement of the main objectives;

1. **Lessons Learned**

The evaluator will present lessons and recommendations on all aspects of the project deemed relevant. The evaluator is asked to pay special attention to analyzing the lessons making recommendations on issues related to factors that help or hinder: the achievement of the objective and outcomes of the project, the sustainability of project benefits, innovation, catalytic effect and replication as well as monitoring and evaluation. Here are some questions to consider:

* Is there anything worth mentioning that is special or critical that was learned during implementation of the project this year that is important to share with other projects so that they can avoid this error or use this opportunity? "
* What ought to be done differently if the project started again?
* How the project contributes to technology transfer?
* How the project has contributed to technology transfer?
* To what extent this UNDP-GEF project is relevant to national and local efforts to reduce poverty / Democratic Governance / strengthening capacities for crisis prevention and recovery / gender equality and empowerment of women? Please explain
* Has the project created so far environmental global benefits as well as contributing to the achievement of national priorities for environmental management and sustainable development?

1. **Annexes to the evaluation report**

* Terms of reference for the evaluation
* Agenda and itinerary
* List of persons interviewed
* Summary of field visits
* List of documents reviewed
* Questionnaire used and summary of results
* Comments of stakeholders (only in case of discrepancies with the findings and conclusions of the evaluation)
* Review and approval Form of the RCU and CO

## ITINERARY

Table 6‑1. Air and land itineraries of H. Rodriguez.



## LIST OF INSTITUTIONS / INDIVIDUALS VISITED



## Summary OF interviews

|  |  |  |  |
| --- | --- | --- | --- |
| Location: | | | Montevideo |
| Consultants: | | | Humberto Rodríguez |
| Project: | | | Uruguay Wind Energy Programme - UWEP |
| Mission dates: | | | 22 a January 30, 2013 |
| **Objective:** | | | 1. **Getting key information firsthand** 2. **Answering questions about previously performed document review** |
| **Date** | **Meeting and Key Considerations** | |
| Tuesday, 22 January, 2013 | 1. **9:00 to 10:30 Meeting with UNDP Staff**   Questions were raised about the project related to its interaction with UNDP and were mainly on administrative procedures.   1. **17:00 Professor Joseph Cataldo and Alejandro Gutiérrez, University of the Nation**   The University of the Republic has played an important role in the development of wind energy in Uruguay and UWEP project.  Since 1988 there is an agreement with UTE to start work in wind energy.  The University conducted the wind potential assessment of the country during 1988-1993. In 2000 the University installed the first wind generator (150 kW, Nordex, asynchronous generator, stall) in the Cerro Los Caracoles. Then prepared for the Ministry a work plan to identify barriers to include wind power in the energy mix.  In 2003 the University developed a project for the GEF. Institutional support was obtained from the DNE, Montevideo Municipality, Chamber of Industry of Uruguay, ADME and UTE. This first proposal did not receive the approval of the government, being stalled until 2005.  Then they formulated the second version in which the executor is the Ministry of Industry. In the PDF-B, 30% of the project budget was allocated to the University, firstly for the development of the wind map and secondly, for the measurement station network.  This project launched Wind Energy in the UTE. The University is considered a definitive factor for project success. The main products of the project are:   * The Wind Energy Map of the country was prepared, using historical data. A second edition of the map was then prepared using measurements data. * A measurement network and associated database was established. The UTE manages the database. The network consists of 25 NRG stations and four Ammonit purchased by the project with GEF resources. * Capacity Development. The human resources that manage the wind information in UTE were trained in the project. The GEF incorporated 2 people who were assigned to the UTE and trained at the University (Eliana Cornalino and Martin Draper)   Other tasks performed for the project were:   * Evaluation of local capacity to develop wind generators. Visits were made to businesses and institutions, and the ability of Uruguayan companies in wind energy was assessed. * Proposed legislation on land use. Literature review of global legislation for land use was performed. * Formulation of the elements of the Environmental Assessment.   It currently has 3 research lines:   * Forecasting of the wind resource. The University developed an operational forecasting model in cooperation with UTE. * Characterization of extreme events (tornados) * Incorporation of wind energy in urban environments. | |
| Wednesday, 23 January, 2013 | 1. **9:00 Eduardo Abenia (former president) and José Perruccio (President). AUdEE**   The AUdEE evolved as the result of collective interest in using Wind Energy in Uruguay. One factor that led to interest and meeting of stakeholders was the competition for the National Wind Turbine (December 2008) which brought together nearly 150 people. In May 2009 the first meeting of the Association took place and on June 15, 2009 (Day of the Wind) was the date of birth of the AUdEE.  The association is open to everyone; it is made up of individuals. AUdEE is involved in information dissemination and organized the First Wind Energy Day Uruguay Brazil in 2009. It has three working groups: Micro and Large Sacle Generation, Logistics, and Circumstantial. It also has the web site[www.auee.com.uy](http://www.auee.com.uy)   1. **10:00 Ing Juan Pablo Saltre, Ventus**   Ventus is a Uruguayan consultant company that started in 2007. It has worked for the wind farm Kentilux (See technical visit). It has also developed an industrial project self-generation wind turbine of 1.8 MW Vestas V100; it sells the energy surplus in the spot market.  In his view, the UWEP led to:   * Awareness of different sectors on wind energy. Before 2008 there was no talk of it. * Decrees of dispatchability, auto-producers and industrial consumers of December 28, 2011 * The development of AUdEE * The development of wind energy in Uruguay and developed capacity in the DNE and the UTE   The development of wind energy has to face at present logistical challenges, grid limitations, roads and ports for the installation of the wind projects in development.   1. **11:00 Dr. Eng. Gonzalo Casaravilla, President UTE**   This meeting dealt with the purpose and scope of the evaluation of UWEP. Some aspects of the interview were:   * UWEP worked in close interaction with the UTE and facilitated wind energy experts who participated in wind generation projects of UTE in technical, regulatory and operational issues, mainly. * Then the interview focused on the development strategy of the electricity sector in which wind power will have a strong participation in the generation of the country, reaching a 29% share in 2015. It is important to note that wind generation is cost-efficient for UTE   See: Casaravilla, G. (December 2012) Expansion and Infrastructure Power generation from 2012 to 2020, ppt.   1. **13:00. Daniel Perez, UTE Wind Projects Group (former UWEP Project Director)**   All factors listed below are, in the opinion of the interviewee, important for the successful development of UWEP.  External factors which UWEP supported but was not decisive, were:   * Low price of wind equipment in the international market * Uruguay offered an image of stability and reliability for long-term investments. This advantage of the country was presented by representatives of UWEP and other agencies in international forums as a credible investment opportunities in Uruguay   The topics where the UWEP was decisive (in the sense that if the UWEP had not existed, they probably would not have materialized) are:   * Identification of Wind Energy in the Investment Promotion law * Tax incentives for Renewable Energy in Uruguay * Capacity Development. Needs were identified in the UTE and ability to have projection in the Wind Division, two engineers of UWEP were assigned to UTE (paid by UWEP) that were subsequently absorbed by UTE. * Establishment of AUdEE. UWEP presented the favorable environment for the creation of the Association which has the function of being a forum for the development of Wind Energy, involving many different actors. * Induction of processes independent from specific people and UWEP in order to ensure the sustainability of the project. * UWEP developed interagency agreements with actors such as UTE, the University of the Republic, Chamber of Industries, among others. * UWEP assumed the role of coordinator between the stakeholders to be receptive to proposals and initiatives of the actors, which in turn generated credibility and support to the project stakeholders. * Development of Wind Map of Uruguay. * Making interagency training for knowledge sharing between UWEP, URSEA, UTE and DNE. * Technical training on wind energy to technicians from Departmental Governments and the National Authority on Land Use. * Strategic Environmental Assessment of the "Energy Policy 2005 - 2030" * Wind measurements campaign at sites away from the UTE transmission network.  1. **14:00 UWEP Team (former personnel) consisting of:**  * Eliana Cornalino, Technical Consultant, wind measurements. * Eliana Melognio - Project Economist. * Nicholas Castroman, Project Economist * Enxo Melani, Technical Consultant - parks authorizations monitoring and due diligence   The UWEP began in 2007, first hiring officials in early 2008.  At the beginning there were many barriers, lack of personnel and expertise. Today looking back it is considered that:   * There was a lack of legal and environmental support to the projects * There was poor project's ability to support UTE negotiations   It is considered that the most important results of UWEP are:   * It attracted international actors. Interest was generated by the country inviting international players. * Uruguay became a focus of interest for investment in wind energy * Constitution of AUdEE as a promoting factor for the development of Wind Energy * Micro-generation arose as a wind energy opportunity in the Uruguay * National capacities. Participation of goods and services in the wind energy projects. There has been development in consulting, equipment installation, shipping and handling of large loads. * The second wind map was made with project resources. The integration of the work of Prof. Cataldo and UTE. UWEP allowed merging the results of the University and UTE. * It appears as a deficiency the absence of an Environmental Regulatory Framework that will need to be developed by DINAMA (National Environmental Directorate) and which has not gone hand in hand with wind energy development. The UWEP contributed to the process of the Prior Environmental Authorization (AAP). This deficiency is probably one of the main barriers to wind energy development.   New initiatives are proposed:   * To develop a new project to address environmental issues * To develop a Single Window to centralize the processing of all permits for wind energy projects (currently there is the need to interact with 6-8 organisms)   The support of the International Consultant (Remi Rijs) in 2008/2009 is considered very valuable for the contribution to the strategy due to his very good knowledge of the GEF project cycle.   1. **15:30 - Antonio Azziz, Pertiluz (President)**   Partiluz manufactures transformers for wind energy up to 3000 kVA, with voltages between 660 and 780 V, and high voltage up to 36 kV.  In Vestas windmills the transformers are placed in the nacelle, are dry-type and encapsulated in epoxy resin. Partiluz has not been involved in the supply of transformers for the wind projects until now. For wind turbines in which the transformers go down inside the tower, these are of the Slim type. Those who go down and out of the tower are conventional or PAD mounted type.  UTE requested by 20% of national participation in the first wind farms, and those who exceed this participation, will receive benefits. For a product to be considered as national, the value added in Uruguay must be at least 35%.  Contributions of the project were:   * + - Attendance at meetings allowed contact with project bidders     - National integration conditions gives some preference to the supply of transformers     - It has allowed the company to have international presence and start marketing their products in Mercosur.   What could have been done better?   * Preference at tender offer should be extended to those that integrate more components in the execution.   It is considered that the program has been successful because it has contributed to the wind energy development in the country | |
| Friday January 25, 2013 | 1. **10:00 Arch. Jorge Rucks, Director, National Environment Directorate (DINAMA),** Paul Caldeiro (DNE), Daniel Bernardi (UNDP)   DINAMA is an important partner in the development of wind power because it is responsible for the Environmental Permits.  The UWEP has helped to build trust between the actors involved in the development of wind energy. DINAMA considers that the Strategic Environmental Assessment did not work well due to institutional constraints since even now personnel with no experience in these assessments and much less, oriented towards wind power, is hired. At present there is only one official involved with wind energy.  However, the UWEP produced useful material for further development of SEA for wind energy.  In Uruguay, the Environmental Permits have several stages. They are classified into three categories: A, B and C, according to level of environmental impact and location analysis. Those classified as A, are approved. The B requires evaluation and its results are disseminated in cities. The study implies a detailed environmental impact assessment and a public hearing is conducted in person with those who feel affected. Wind projects are classified in category B (some C due to the proximity to protected areas or environmental risk identified).  The SEA seeks to evaluate the policies and programs creating a precedent for the evaluation of other projects on a case by case basis, which would lead to re-evaluate the project and make the approval of the environmental licensing procedures more agile. If SEA would have developed, the project evaluation process would have been facilitated. The process has been slow and cumbersome. Working with SEA have given some learned lessons:   * Limitations were found in capacity and experience, issues that must be addressed by DINAMA   At present there has been a flood of applications for wind projects. DINAMA has decided to:   * Convene bidder winners of wind projects to clarify and explain the general criteria that apply - in each specific case it has worked with adjustments required. * Exchange information with the DNE * Seek to achieve a balance of requirements  1. **11:30 Mrs. Gabriela Batista, ADME** (Electricity Market Management)   Programming of the Uruguayan Energy System :  2 Seasonal schedules are performed each year in February. Results for the seasonal programming are:   * Operation expected for the semester, the expected energy consumption * Fuel Expense * Marginal cost expected by time post with probability of surplus. * Estimated black-out.   To program weekly operation   * For short-term, they use the software OPERGEN of Iberdrola, and for the long-term, Electricité de France (EDF) software * The hourly demand forecast * Unavailability forecasts of all plants * Availability of energy exchanges with Argentina and Brazil * The model that prioritizes water is used * Figure of merit, cost and value of water   Regulation provides self-dispatched for power plants with less than 5 MW.  Contributions of UWEP:  The Uruguayan electrical system does not have physical limitations that hamper the operation of wind energy. However, the units engaged in the operation of the system are faced with the challenge to modify operating procedures to make it more flexible because the programs must change according to the wind forecasts. The more wind power installed, stronger the need for operational flexibility.  It will also be necessary to adjust the energy exchange agreements with Argentina and Brazil to make them more flexible. This can increase the chances of making the most beneficial use of wind power, because wind power can be exported if the production is high.  Another point that this project requires is focusing on having good wind forecasts. While UTE has an agreement with the UDELAR to develop a wind power forecast model, UTE must continue to improve the forecast as more wind power inputs enter into the system.  Another issue with which the Uruguayan system must deal and for which it should prepare is the spinning reserve allocation as power plants with more capacity provide additional services and voltage control, and at times of high wind power generation such services and controls are still needed.  ADME Website: publishes the following information:   * seasonal, weekly, daily programming * expected and executed spot price * previous day postoperative * monthly and yearly report of the executed operation   All reports and schedules contain the generation by power plant. In the case of wind power published values are the sum of all the generation of each source.   1. **Visit to KentiluxWindfarm13:30**   See next section. | |
| Monday, January 28, 2013 | 1. **Tabare Pagliano SOWITEC Director, 9:00**   SOWITEC (SonnenWind Technology of Germany Sonnenbühl based near Stuttgart) is in Uruguay since 2006, through its subsidiary "Sowitec Uruguay SA".  SOWITEC has since 1995 parks in Germany, and to date has not installed parks in Uruguay but through one of its subsidiaries called "Minas SA Wind Generation" was awarded a 42 MW park in Zone The Valleja, 15 km south of Mines. Vestas machines to be used are V112, 3 MW, 95, 112 m rotor diameter, 14 machines for a total of 42 MW. Entry into operation 1stquarter of 2014. Wind measurements were made since April 2008, nearly 5 years (1 tower, lattice 30 cm side, 66 m height, with wind anemometers at 20, 40, 60 m).  Also, through another of its subsidiaries, in this case "Vientos de Pastorale SA" it was awarded 49.2 MW in the Department of Flores, near the city of Ismael Cortinas.  The energy price was US$ 63.9 / MWh, adjusted for parametric formula. The formula is: 40% is fixed (fixed assets and disbursements paid in the first 2 years and unaffected by depreciation). And 60% of the price is updated in time (divided into the national fraction which is adjusted by the CPI and the abroad fraction is adjusted by US CPI. Two indexes were added: a penalty if the national component supply does not reach the level of the national component declared in the bid offer and a correction factor for the exchange rate between current the year and the year in which the offer was awarded.  UWEP significance for the country   * It is fundamental for the country as it aims to incorporate wind power in the energy basket * It has removed some awareness barriers (lack of knowledge of the technology) * The geographical distribution of wind plants ensures a certain minimum of contribution of the wind to the load dispatch, equivalent to a "minimum plant factor at country level", considering all the parks of Uruguay as being a "single park". * The reports and studies generated by UWEP were disseminated in the country and reached also the National Parliament. * The change in the Parliament took place. Wind energy was the force that motivated a law to adjust the lease terms to 30 years (normally 15) in the case of lease holdings in energy endeavors (wind, solar, biomass, etc.). * The wind map slightly underestimates the wind resource in the north. * There are already in operation 20 MW of UTE, 18 MW of Kentilux, 150 MW awarded in 2010, 192 MW in the second phase of August 23, 2011 (US$ 63.90 / MWh), then there was a call for bidders who had participated in the bid call 2011 and had not won, UTE has offered to accept their proposals if they accept the price of US$63.5/MWh. Here, 450 MW came out in 9 different venture projects, each one with 50 MW.   Significance of UWEP for your company   * The company would have needed to lobby to convince decision-makers and avoid "misinterpretations" * It succeeded in projecting a reliable picture of the country regarding the prospects with Wind Energy. It became state policy. * UWEP reflected the interests of wind developers. The project acted as a link between the state public activity and on the other hand the private sector.   What should have been done better or what deficiencies are to be noticed?   * The project suffers of the day after problem. UWEP should have a person to act as CEO (within the GEF?) that might have made a link with the institutions to make a "smooth" transition. * The possibilities of incorporating national components appear to have been overestimated in the beginning; this is probably due to the surveys with Uruguayan industries whose statements about possibilities seem to have been too optimistic in some cases. One issue is the program of integration of wind power and another issue is the local capacity building for manufacturing of components. The process of local capacity building for production of parts, although it might be in some way referred to in UWEP, should be part of another independent industry program. UWEP was somewhat gullible to process information, perhaps too optimistic on existing local capacities for production of parts. * It requires a certain level of production to achieve production local capacity. As an example, demand and annual production should be: blades 500-1000 MW, and 1000 MW or more in the case of the nacelles. * The Decree 354, 2009 to support renewables program provides for the exemption of 90% of income tax until 2017, and until 60%, until 2019. * Through investment promotion, the elements that make up a wind farm can enter the country with 0% rate, and be declared as promoted investment.  1. **11:00 Virginia Echinope, DNE Electric Power Unit, Director**   28/01/2013 11:14 a.m.  UWEP significance for the country   * It made the measurements and the wind map very well. * The Faculty of Engineering offered training courses, calibrated anemometers, conducted noise studies, etc. * Helped to evaluate the wind resource * Created awareness about Wind energy in the country at different levels   Significance for DNE:   * The UWEP partially funded the study with Energinet for the interaction between the wind energy and the national grid. * The project opened a space for the DNE in the electricity sector and has also been a facilitating factor for the wind energy development. * Participated in   + The decrees   + Interacted with the Chamber of Industry to obtain national component certification   + Helping to determine what are the national capacities for the development of Wind Energy   + talks with companies from Brazil and Argentina to explore synergies for development of Wind Energy   + promotion of the Overall Energy Development Plan   + Participated in the development of the bidding specifications in conjunction with UTE for long term (20 years) energy purchases.   + Hiring studies that are difficult for the state. UWEP provided quickly expert contracting services.   + The project had a lot of flexibility in the implementation   The new challenges that have emerged are:   * The new battle is how to reconcile resource use with the current system * How the operation of the system will be affected, an issue that was not raised because only 5 MW were expected.  1. **12:00 Mr. Ignacio Afonso (UTE, formerly UWEP)**   UWEP significance for the country   * It served to provide information and update on the state of the art of Wind Energy to the managerial staff of UTE, DNE, the political leadership of the country and the Ministry of Industry, Energy and Mining. * UWEP sponsored the conference of wind equipment manufacturers from Germany, Argentina and Brazil * UWEP participated in the drafting of the technical conditions for the incorporation of wind energy in the Uruguayan electric system. It contributed to the specifications and technical conditions for the Wind Energy Purchase and contracts * The project promoted wind energy as a sustainable source at different levels   Significance for DNE:   * Training of technical staff * Participation in wind energy encounters in Germany, visiting companies like Enercon and electrical system operators * The generation unit in UTE is divided into hydraulic and thermal sub-units. There is no a specific wind unit, but the creation of a wind power management unit is scheduled at the end of 2013 (UTE is in the process of corporate restructuring).   What should have been done better or what deficiencies are to be noticed:   * At the beginning there were wind resource, electrical power systems specialists and economists. There was a lack of Personal related to environmental issues and logistics. * A further stage of the project is not needed. It is time to take decisions and actions. * The project served its purpose because it was to facilitate and promote the development of the Wind Energy in Uruguay. The implementation is a task of UTE, the state and other organizations, among others.  1. **14:00 Dr. Ramón Méndez, Secretary of Energy, Ministry of Industry, Energy and Mining**   The UWEP has been of great significance for the country.  Highlights of the introduction of wind power in the country are:   * There is a very solid process in the country which will become the country with the highest percentage of wind power in the electricity supply in the world * Uruguay will have between 25 and 28% wind energy in the energy mix, tripling the German average. * Uruguay will have a single dispatch model with large share of wind power * It has offered US$ 62 / MWh without subsidies, without Feed-In-Tariff, reducing the generation costs for the country. * The development has been outstanding. Coming from nothing and wind energy becomes the base, having resolved technical problems and costs.   What are the success factors of the project?   * A pivotal element has been the role of the state driving the process. Planning defined in 2008 a long-term policy, in 2010 the four parties agreed the energy policy for the next 25 years, which is a factor of attraction for investors and is the basis of the project development. * The country factor is low-risk to investors, highly rated (AAA), a low-risk recognized state. * Long-term policy, credible and stable regulatory framework, investment sustainability for investors. * This setting was achieved through steps:   + making measurements covering the entire country by the project,   + measures audited by G Hassan,   + association with the academy that allows to place wind measurements means in the wind map,   + Operating frameworks (one of the few countries where the wind resource is considered a public good (easement, any owner of private land must allow measurements, installation, operation and land use change, with compensations)   + Appropriate Regulatory Framework: dispatch priority given to ensure floating reserve, network stability and proper operation   + Economic conditions. The best conditions to bidders: dispatch priority. * Two factors IRENA highlights:   + Firstly, there are no subsidies, which is a guarantee for the sustainability of the process and it is a genuine market depending on competitive conditions, and   + Secondly, the state is responsible for all to happen (state enterprise launches project competition) and the contract is backed by an AAA company, ensuring that rates are going to be paid, in a stable country. * The Uruguayan experience has been presented at COP 18 (Conference of the Parties) of the UNFCC (United Nations Framework Convention on Climate Change) in Doha by the company SEEG.   What should have been done better or what deficiencies are to be noticed?   * The academic sector was a leader in knowledge transfer. As a subject of interest for country, it requires a strong academic sector. Temporarily consultants are being brought to the country. * Not having achieved greater national participation in the projects. A greater national participation (components, transfer of technology, jobs, etc.) was required. But the scale and political immaturity of the Uruguayan market does not make believable that there is a national wind industry. There will be a study to measure the impact of wind power in the labor market, how renewable energy industries create jobs and how it is generated. There is a smoke free industry (service industry for parks, cranes, etc.), studies, new developments in networks stability, etc. * The political immaturity of Mercosur in terms of integration that could allow greater integration of components and services in projects. * Strategic alliances, for example with Brazil, for the development of wind.  1. **15:00 Mr. Oscar Ferreño, Generation Area Manager, UTE**   Eng. Ferreño was a member of the Steering Committee of the project  UWEP significance for the country:  In the process, the following facts emerged:   * Wind energy is very abundant. There was no awareness of this. The potential is in GW. * The parks are having a capacity factor between 40 and 45%, double the European factor * **Success factor is the nationalization of the market.** More than the property the operation is relevant. * The dispatch has joint control of all hydropower centrals. Thus arose the problem of deliverability of wind farms. Wind energy will be first dispatched, then water, then thermal * **Another success factor** were the measuring stations: 4 with MIEM (DNE) and UTE installed 31 measurements stations for a total now of 35. The first were with the UWEP. Improved wind map * The time scale for the resources is different: Wind power is not reliable in the short term but in the long term. * The key environmental barrier is the landscape. The first mills of the mountains are seen from the distance. Second, the migratory birds. Kentilux is a model – does not interfere with farming activities. It limits aerial spraying of plantations.   Significance of UWEP for UTE   * Opened the eyes of UTE in relation to wind energy. In 2005 it had halted the development of hydropower. In 1982 the last central was built. Electricity generation was 3 times the demand. Uruguay was a net exporter of energy. * Now the demand is growing and doubling every 20 years. * Uruguay thought its thermal reserve was in Argentina. The 2002 Argentina crisis affected the power supply to the country. Uruguay increased the purchase of fossil fuels. * In two years Uruguay will have the highest % of Wind Energy in the world (is going to exceed 40%). * The UWEP acted as a catalyst * The first park of UTE took advantage of debt relief with Spain.   What should have been done better or what deficiencies are to be noticed?   * The part that did not go so well was the incorporation of the domestic industry. That segment has been low.  1. **16:00 Cesar Burdiel, Director and Aldo Felice, Advisor, Chamber of Industries of Uruguay**  * The Chamber of Industries of Uruguay (CIU) has been delegated by the Executive power as a qualified entity for certification of origin in the field of international trade. * The political definition of diversifying the energy matrix and, with it, the strategic definition to promote national industry and technological development components, set an excluding condition for participation that at least 20% of total investment came from national components. The total investment to consider, excludes three major concepts: purchase or lease of land, the park maintenance costs, financing costs and, depending on the process in question, the interconnection to the National Integrated System (SIN). * Current Status of situation:   + Very favorable:   + High interest for participation. E.g.: in the second call for the installation of 150 MW, the offers exceeded 800 MW.   + CIU has already certificated one park and is now close to certify two more projects (biomass). * The methodology that to date has the character of a Ministerial Resolution was developed by the DNE with the collaboration of the CIU. This methodology establishes the criteria for determining the national character of each investment component.   UWEP significance for the country?   * It has been an important and strategically wise decision to promote domestic industry and thus components that contribute to the technological development of local industry.   UWEP significance to the Chamber of Industry?   * The CIU was not involved in the definition of 20% of national components.  1. **17:00 Mr. Fernando Schaich, SEG**   Significance of the project for the country.   * The UWEP is considered very successful. It has been an extremely dynamic process * UTE and the DNE called asking how they could help   Significance of the project for your company   * The UWEP opened opportunities for the development of wind energy in the country. * SEEG presented offer to the 1st bid, but the price was high. In the second tender, SEEG quoted 64.96 US $ / MWh (the cap was 65 US $ / MWh) and won 100 MW. Final price was 63.90 US $ / MWh * The three towers were telecommunications services. It was needed to negotiate with 15 owners. The negotiation was with 2 owners and 1 at the north. * Measurement Tower: Reticular of 81 m, Ammonit anemometers anemometer at 3 levels Thies. Total cost: about U.S. $ 60 000 (installation cost 8,000 and the tower cost $ 25,000) * For the park, there are soil surveys, telecom certifications that the park will not cause interference, environmental approval (DINAMA), authorization of the Municipality of Tacuarembo. * The program has had a huge impact on business. * But there can be a boomerang effect   What you should have been done better or what deficiencies are to be noticed?   * There are others obstacle such as the port, customs and the Ministry of Transportation that can hamper developments   Suggestion: a single window for wind projects procedures | |
| Tuesday January 29, 2013 | 1. **UWEP 11:00 - Paul Caldeiro**   The evaluator had the opportunity to consult the documentation of project where he observed the existence of related project documents, correspondence between UWEP, compared standards, consultancy reports, contracts, etc.., all these material very carefully preserved. | |

## KENTILUX WIND FARM VISIT

Date: February 1, 2013

Location: 42 km of the Route 1 to San Jose.

Figure 6‑1. Partial view of the wind farm (capacity of 17.2 MW on January 2013)



Three 50 m towers were installed in 2009 for wind measuring.

Kentilux The wind farm was developed in two stages:

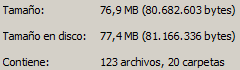
* First stage: 5 x 2 MW Vestas V90 diameter 80 m, 80 m tower, in operation since January 2011;
* Second stage: 4x1.8 MW Vestas V100 100 m diameter, 80 m tower, in operation since January 2013
* Total Capacity on January 2012: 17.2 MW.

The origin of the companies was as follows:

* Uruguayan companies: consulting, transportation, foundations, access roads, electrical installations, operation.
* Foreign companies: supply of equipment, installation.

## LIST OF DOCUMENTS REVIEWED

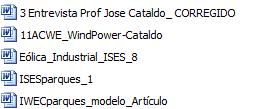
The information received from the GEF DNE and consists of 123 files in 20 folders with 76.9 MB



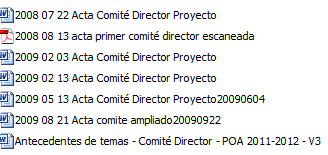
The following table shows the files received. This information is systematized in the digital version of the report.

Table6‑2. Project Documentation





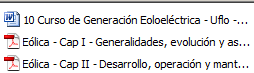






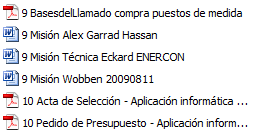






(Continued)

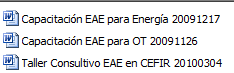




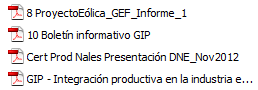










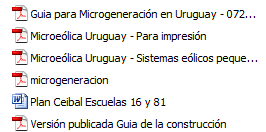






(Continued)

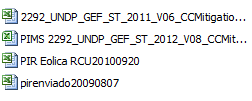




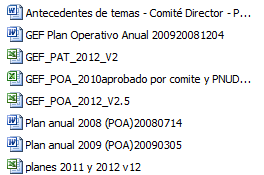






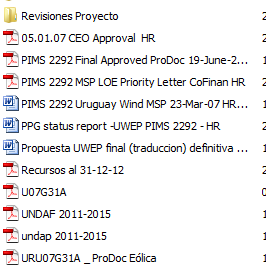






(Continued)



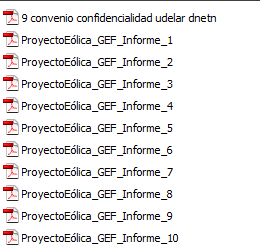


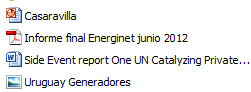




(Continued)



-4900 US



## Comments

This section is intended to submit comments to the draft report by the UNDP-Uruguay, DNE, and the UNDP Regional Technical Advisor-GEF. The report was submitted for review on March 15, 2013. This section displays all the comments received and referred to page Draft Version 1.0 gives the response and / or action taken.

### Uruguay UNDP Comments

Comments were received by the consultant on May 2, 2013.

Comment 1. Page 3-6

¨ The Project Steering Committee is composed of the MIEM (through the Director of Energy or his delegate) the UTE, and UNDP, and the participation of the Project Coordinator. (See minutes of the steering committee) ¨.

Answer. According to the precision made the paragraph reads:

A Project Steering Committee (PSC) was also constituted integrated by the MIEM (through the Director of Energy or his delegate), the UTE, and UNDP, and the participation of the Project Coordinator.

Comment 2. Page 3-9

Documentation on M & E (2007-2012)

The project had no midterm evaluation. There were regular reviews by the Chief Technical Advisor (CTA) Remi Rijs.

Answer. Correction is made that R Rijs conducted a technical assistance to the project.

Comment 3. Page 3-11

¨In fact, the project conducted a Strategic Environmental Assessment for the energy sector, although it was not taken into consideration by the authorities¨.

Answer. In fact, the project conducted a Strategic Environmental Assessment for the energy sector, which was not taken into much consideration by the authorities

Comment 4. Page 3-12

The UNDP audit policy during the period of the project is to be audited at least once (one year) in the life of the project or whenever execution exceeds a defined level of USD $600,000. This is what has been done. Please revise!

Answer. According to UNDP rules, this project an audit should be conducted. UNDP received the audit for the period January 1 to December 31, 2010. This report is clearly clean and free of observations.

### DNE Comments

Comments were received by the consultant on May 16, 2013.

Comment 1. Page 2-1

¨ Consider participation of imports through interconnections ¨.

Answer. ¨ to be added: imports of electricity through interconnections with other countries ¨.

Comment 2. Page 3-7

¨ I have no clarity of how many audits were conducted in the whole process of UWEP ¨.

Answer. According to Mr. Bernardi of UNDP Uruguay, under the rules there was only one corresponding audit as was done. The new paragraph reads then:

¨ According to UNDP rules only one audit should be performed, as indeed was carried out in 2010 with satisfactory results ¨.

Comment 3. Page 3-10

¨ The SEA is for energy policy in general, and takes into account particular aspects of wind energy¨.

Answer: This assessment should be corrected and written as follows:

While the SEA covers basic aspects on wind energy, this area should be studied deeper, which requires sufficient qualified staff at DINAMA.

Comment 4. Page 3-11

¨ UWEP / DNE developed as mandated by the decrees on wind power, the Assessment Methodology of the national component, supported by the CIU. The latter certifies the % of national component incorporated”.

Answer: According to this clarification:

¨ UWEP / DNE developed as mandated by decrees on wind power, the Assessment Methodology of the National Component, supported by the Chamber of Industries of Uruguay (CIU). The latter certifies the % of national component incorporated”.

Commentary 5. Page 3-17

¨ Services leased to UTE by ADME, which is responsible for the energy dispatch ¨.

Answer:

¨ without a doubt, Wind Technology has been appropriated by national stakeholders; there remain obviously some more advanced aspects still to be tackled than those envisioned with UWEP such as those linked to the operation and the dispatch of the parks in the interconnected national grid, dispatch which is the responsibility of the ADME ¨.

Comment 6. Page 3-24

¨ I would rather say "identified", because there was no specific selection, instead it was by the technical, economic, etc., conditions. Today is there is work in a bidding call for solar photovoltaic power¨.

Answer: The sentence should read:

Renewable energy sources identified were bioenergy, small hydropower, solar thermal and wind power.

Comment 7. Page 3-32

¨currently. it should be made clear that UWEP`s four posts handled data management during the first year, information was sent "raw" to UTE, and monthly reports of average speed, compass rose, Weibull parameters, were sent among others.”

Answer: It must be clear that it is in present time.

It should be also stated that an information management system was designed and implemented and is currently operated by the UTE.

The footnote will explain:

UWEP`s four posts handled data management during the first year, information was sent "raw" to UTE, and monthly reports of average speed, compass rose, Weibull parameters, were sent among others.

**6.7.3 Comments from the UNDP-GEF Regional Technical Advisor**

Regional Technical Advisor referred on May 17, 2013 the following note:

¨ I have reviewed the final UWEP evaluation document and I have no substantive comments on the document and the outcomes of the evaluation ¨

### Approval Form

**APPROVAL FORM TO BE COMPLETED BY THE UNDP-CO and UNDP-GEF RCU**

Reviewed and approved by:

***UNDP Country Office***

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***UNDP-GEF RCU***

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### Management and monitoring response template

Title of evaluation: FINAL

Date of evaluation completion: APRIL 2013

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Main recommendations and key issues** | **Management Response \*** | | | | **Follow up \*\*** | |
| **Reply** | **Key Actions** | **date** | **Unit (s) Responsible** | **Status \*\*\*** | **Comments** |
| Financial Audit (2012 - June 2013) | Procurement audit |  | Before June 30, 2013 | UNDP | pending |  |
| Full inventory of goods and services financed by the GEF (a) | Raising the inventory |  | Before June 30, 2013 | DNE with UNDP support | pending |  |
| Final Report (b) | Elaborate report |  | Before June 30, 2013 | DNE | Pending. It is not mandatory but recommended |  |
| Closing Event (c) | Organize event |  | Preferably before June 30, 2013 | DNE / UNDP | Pending. It is not mandatory but recommended |  |

\* Unit (s) assigned to account for the preparation of a management response. Columns should be filled under section management response.

\*\* Unit (s) assigned to account for the preparation of a management response. This shall update the status of implementation.

Implementation \*\*\* Status: Completed, Partially Completed, Pending.

*NNOTASNO*

1. Transfer of property (non-fungible) resources acquired by UWEP for the DNE, in particular measuring stations, software packages and purchased library materials (standards)

(B) It recommends the development of report a by the UWEP although it is not mandatory according to PRODOC.

(C) Presentation of results of the final evaluation and lessons learned with the UWEP

### DVD with the full report

The DVD contains all reports and project information.

This DVD will go together with the Final Printed version

# LAST PAGE OF THIS REPORT

1. UNDP Project Document *Uruguay Wind Energy Program (UWEP) -* UNDP-GEF PROJECT (Project PIMS No. 2292) (2007) United Nations Development Program. Montevideo [↑](#footnote-ref-2)
2. The Terms of Reference for the Project Management Unit are presented in Section IV of PRODOC, page 52. [↑](#footnote-ref-3)
3. The Terms of Reference for the Project Management Unit are presented in Section IV of PRODOC, page 52. [↑](#footnote-ref-4)
4. PDF/PPG Status Report –UWEP PIMS: 2292 (17 March2007) [↑](#footnote-ref-5)
5. The methodology included review of documents received from the parties, interviews with them and other stakeholders, field visits and presenting preliminary results to the parties. [↑](#footnote-ref-6)
6. This cost is a bit high for current values of approximately US$2,000/kW, but bear in mind that the purchase was made in 2007, and the site is on hills with consequent additional site preparation, roads and power lines. [↑](#footnote-ref-7)
7. Personal Communication of P. Caldeiro, DNE, April 9, 2013 [↑](#footnote-ref-8)
8. PRODOC, p. 13. [↑](#footnote-ref-9)
9. Total GEF Grant of $ 1 million, resulting in 1.20 million metric tons of avoided emissions (0.18 metric tons avoided directly and indirectly avoided 1.1 metric tons). PRODOC, p. 25. [↑](#footnote-ref-10)
10. <http://www.audee.org> [↑](#footnote-ref-11)
11. *Uruguay Wind Energy Program (UWEP) -* UNDP-GEF PROJECT DOCUMENT (Project PIMS No. 2292) (2007) United Nations Development Program. Montevideo [↑](#footnote-ref-12)
12. DNETN split into DNE and ARNR in the Budget Act 18.719 of December 27, 2010. DNETN will be referred to as DNE hereinafter. [↑](#footnote-ref-13)
13. Project Document. *Uruguay Wind Energy Program (UWEP)-UNDP-GEF PROJECT (Project PIMS No. 2292)****.*** United Nations Development Program. (July 17, 2007). Montevideo [↑](#footnote-ref-14)
14. Project BID-CONICYT 116: Feasibility Study on Wind Power Supply to the National Electric System. [↑](#footnote-ref-15)
15. GTER has conducted several studies for UTE "Draft National Wind Potential Assessment", "Quantifying the Uruguay Wind Potential Applicable to Large Scale Power Generation", "Quantifying the Uruguay Wind Potential Applicable to Autonomous Electric Power Generation ". [↑](#footnote-ref-16)
16. *PDF-B. Uruguay Wind Energy Programme.* UNDP - GEF (2007) [↑](#footnote-ref-17)
17. PDF/PPG Status Report. Uruguay Wind Energy Programme (UWEP). 15 March 2007. UNDP [↑](#footnote-ref-18)
18. PRODOC, pp. 16 and following pages [↑](#footnote-ref-19)
19. PRODOC, pp. 29 and following pages [↑](#footnote-ref-20)
20. The DNETN was the initial executor. But this agency was divided into DNE and ARNR in the budget law 18.719 of December 27, 2010. The name DNE will be used hereafter. [↑](#footnote-ref-21)
21. The Terms of Reference for the Project Management Unit are presented in Section IV of PRODOC, page 52. [↑](#footnote-ref-22)
22. Los Términos de Referencia del Coordinador del Proyecto y PMU se presentan en la Sección IV del PRODOC, página 52. [↑](#footnote-ref-23)
23. PDF/PPG STATUS REPORT –UWEP PIMS: 2292 (17 MARCH 2007) [↑](#footnote-ref-24)
24. All Findings and Conclusions sections marked with (E) in the TOR should be evaluated Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U) and Highly Unsatisfactory (HU). [↑](#footnote-ref-25)
25. Project Planning Matrix, PRODOC, p. 29 [↑](#footnote-ref-26)
26. It is recognized that Uruguay has developed 43 MW to 20011 and has plans to integrate up to 2 GW by 2020, having already auctioned 50 MW by 2012. Quoted in: Global Wind Energy Council and Greenpeace International (2013) Global Wind Energy Outlook 2012. Global Wind Energy Council and Greenpeace International. Brussels and Amsterdam. [↑](#footnote-ref-27)
27. PRODOC, p. 21. [↑](#footnote-ref-28)
28. The Strategic Environmental Assessment for the Energy Sector by the PEEU received little consideration by the authorities. [↑](#footnote-ref-29)
29. Rijs, R. (2011) International Consulting support to the Management Unit. [↑](#footnote-ref-30)
30. The most recent PIR June 2012 contains no disaggregated information. [↑](#footnote-ref-31)
31. Note received from UNDP on February 21, 2013. [↑](#footnote-ref-32)
32. Personal note from P. Caldeiro, DNE, April 9, 2013 [↑](#footnote-ref-33)
33. PRODOC, p. 13. [↑](#footnote-ref-34)
34. PRODOC, p. 12 [↑](#footnote-ref-35)
35. Total GEF grant of USD 1 million resulting in 1.28 Mton avoided emissions (0.18 Mton directly and 1.1 Mton indirectly avoided emissions).See PRODOC, page 25 [↑](#footnote-ref-36)
36. The PRODOCs does not explicitly quote the EC employed. It is calculated by taking into account that it is required that "direct emissions avoided in Uruguay be 0.18 Mton C02 throughout the life (20 years) of the wind power 5 MW plant" [↑](#footnote-ref-37)
37. The Capacity Factor (CF) of 35% of course maybe below Uruguayan parks standards. According to a study, the CF varies between 41.5% and 39% in the Cambilargiu Park (20 MW) and 36% in the Magdalena park (10 MW). See: Perez B., D., and J. Cataldo (2012) Analysis of the Uruguayan large scale wind energy generation and its energetic complementarity, after a year of operation. IEEE. Other Information about the article is nonexistent.

    Calculations made with a 35% CF might be judged as conservative but this CF value is the one stated in the baseline of the PRODOC. [↑](#footnote-ref-38)
38. New UTE parks could have CF between 40 and 45% due to its location and the improvement of technology achieved in recent years. Personal communication of Daniel Pérez (March 4, 2013). [↑](#footnote-ref-39)
39. PRODOC, p. 17 onwards [↑](#footnote-ref-40)
40. <http://www.energiaeolica.gub.uy/index.php?page=normativa> [↑](#footnote-ref-41)
41. Nunes, V., J. Cataldo, A. Gutiérrez. Specifications for the purchase of anemometers and monitoring network. Report # 2. UWEP. Agreement MIEM- UDELAR (August 2008) Montevideo [↑](#footnote-ref-42)
42. Nunes, V., J. Cataldo, A. Gutiérrez. Assessment of the usage of phone towers for wind resource measurements. Report # 4. UWEP Agreement MIEM- UDELAR (September 2008) Montevideo [↑](#footnote-ref-43)
43. Call to bid 9 Measuring posts basis URU/07/G31-340. 17 March 2009. [↑](#footnote-ref-44)
44. The instrumentation of each station consists of: two thermometers (located at maximum tower height and 3 meters high), a weather vane at maximum height, a hygrometer located 3 meters high, and four anemometers (located at three different heights, with supports that separate them three meters from the tower). [↑](#footnote-ref-45)
45. Nunes, V., J. Cataldo, A. Gutiérrez. Management of the monitoring system. Report #6. UWEP. Agreement MIEM- UDELAR (December 2008) Montevideo. [↑](#footnote-ref-46)
46. <http://www.energiaeolica.gub.uy/index.php?page=herramienta-produccion-eolica> [↑](#footnote-ref-47)
47. These two wind farms were built by EDUINTER (Spain) as a turnkey project as a result of compensation negotiations with Spain debt [↑](#footnote-ref-48)
48. <http://www.audee.org> [↑](#footnote-ref-49)
49. <http://www.energiaeolica.gub.uy/> [↑](#footnote-ref-50)
50. The four UWEP measurement stations were in charge of data management during the first year by the UWEP. The "raw" information was sent to UTE, and monthly reports were made on average speeds, compass rose, Weibull parameters, etc. [↑](#footnote-ref-51)
51. The stations are of the brand MedOne and consist of a Data Logger, 4 anemometers, 2 thermometers, one relative humidity sensor, 2 vanes and a solar module. Personal communication of D. Pérez (March 04 de 2013) [↑](#footnote-ref-52)
52. Idem. [↑](#footnote-ref-53)
53. For GEF projects with strategic priority 1, a tool known as METT (Management Effectiveness Tracking Tool, version 2005) is required. [↑](#footnote-ref-54)
54. Probable (P): There are no risks affecting this dimension of sustainability

    Moderately probable (MP) there are moderate risks that affect this dimension of sustainability

    Moderately Unlikely (MU): There are significant risks that affect this dimension of sustainability

    Unlikely (U): There are severe risks that affect this dimension of sustainability. [↑](#footnote-ref-55)