

2019

Project Implementation Review (PIR)

**CleanEnerg Cuba**

[Basic Data](#_Toc1)

[Overall Ratings](#_Toc2)

[Development Progress](#_Toc3)

[Implementation Progress](#_Toc4)

[Critical Risk Management](#_Toc5)

[Adjustments](#_Toc6)

[Ratings and Overall Assessments](#_Toc7)

[Gender](#_Toc8)

[Social and Environmental Standards](#_Toc9)

[Communicating Impact](#_Toc10)

[Partnerships](#_Toc11)

[Annex - Ratings Definitions](#_Toc12)

# Basic Data

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| **Project Information** | |
| UNDP PIMS ID | 4899 |
| GEF ID | 5149 |
| Title | Strategies for sustainable technology innovation and transfer of low carbon energy technologies in Cuban rural areas (Clean Energy in Cuba, CleanEnerg-Cuba) |
| Country(ies) | Cuba, Cuba |
| UNDP-GEF Technical Team | Energy, Infrastructure, Transport and Technology |
| Project Implementing Partner | Government |
| Joint Agencies | *(not set or not applicable)* |
| Project Type | Full Size |

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| **Project Description** |
| The objective of the Project is to increase access to bioenergy technology in Cuba by promoting the use of biodiesel and biogas technologies by rural farmers. Specifically, the Project will (i) strengthen government policies in support of small-scale bioenergy technologies; (ii) address technology barriers presently limiting the widespread production and dissemination of cost-effective biodigesters and biodiesel conversion plants in Cuba; (iii) establish a comprehensive network of project design, maintenance, repair and extension services for small farmers to increment local food production, generate new jobs and income, promote community resilience and recover degraded lands. Bioenergy market development under the target beneficiary group will expectedly avoid greenhouse gas emission by conventional, fossil fuels to the amount of 207.1 ktons CO2eq. |

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| Project Implementing Partner | *(not set or not applicable)* |
| Other Partners | *(not set or not applicable)* |

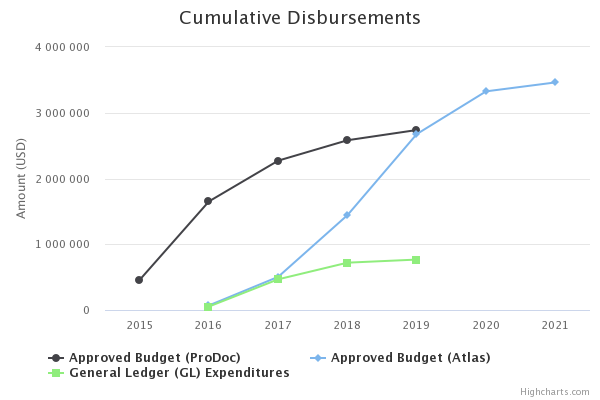
# Overall Ratings

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| Overall DO Rating | Moderately Satisfactory |
| Overall IP Rating | Moderately Unsatisfactory |
| Overall Risk Rating | Substantial |

# Development Progress

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| **Description** | | | | | | |
| **Objective**  **To increase access to bioenergy technology in Cuba by promoting the use of biodiesel and biogas technologies by rural farmers.** | | | | | | |
| **Description of Indicator** | **Baseline Level** | **Midterm target level** | **End of project target level** | **Level at 30 June 2018** | **Cumulative progress since project start** |
| A. Products based on the technology transfers that are approved by the relevant authorities for commercial manufacturing. | A. No products (0). | *(not set or not applicable)* | A. Four products[2] (4) | Culminated technical tasks for the manufacture of four products: biodiesel plants, agitators and torches for the lagoon biodigester systems covered, and thermos of cooling / conservation of milk using biogas, in the companies Cubana de Acero and Varona. We work on the technical tasks of six other products in the companies Marcel Bravo and INPUD.  Investment analysis and pre-feasibility of the production of geomembranes for biodigesters of covered lagoons was completed. Industrial and laboratory equipment supplier selected. | Of the 10 technical tasks identified, they are completed 8. There are still 2 technical tasks to be carried out at the “Marcel Bravo” Factory: the CO2 filter and the hydrogen sulphide filter for biogas, which will be completed in August 2019. Regarding 8 technical tasks completed, the identified equipment and supplies are in different stages of the import process.  The investment analysis and the prefeasibility of the production of geomembranes for biodigesters were completed.  In La Goma company, the main industrial equipment was contracted, for an amount of 135,000 USD and they will enter Cuba before the end of 2019, while the auxiliary and laboratory equipment, as well as the raw material for the geomembranes are in the process of selection of suppliers, with an expected amount of 174,000 USD and it is expected to enter the country before the end of 2019 |
| B. Extent to which policies and mechanisms are adopted for technology transfer[1] | B. No policies and mechanisms adopted (0) | *(not set or not applicable)* | B. Four policies/ mechanisms adopted (4)[3] | A proposal for a strategy to  promote biogas in Cuba is prepared, to be delivered to the Ministry of Energy and Mines; the existing legal, regulatory and regulatory framework that supports it has been reviewed (16 documents), and the potential of existing biogas in Cuba, its equivalence in equivalent tons of oil (TOE in English) and in CO2 equivalent emissions reduction were evaluated. All of the above constitute opportunities; Likewise, 45 barriers for the development of biogas in Cuba were identified (six of policies and regulations, six institutional, 20 technological, five financial, five of information on the potential of biogas and three of technical and economic information) and 52 solutions are proposed to these barriers - these barriers are applicable to bioenergy and lignocellulosic biomass , in general. This proposal reflects the background of the biogas development program in Cuba for the period 2016-2030, and its objectives and expected results, its scope (installation of industrial and private biodigesters, service providers), the plan of activities, the coordinating team, promotion and awareness, technology providers, financial mechanisms, R & D and technical assistance, M & E and dissemination of results, as well as institutional aspects.  A proposal for a strategy to promote biodiesel in Cuba 2016-2024 is prepared, to be delivered to the Ministry of Agriculture. The proposal contains the scope of the program, expected results, required investments, economic prefeasibility, productive and economic indicators, planning of biodiesel production, land sowing and completion of irrigation in four provinces, production of associated food, Investment cost and all technical tasks, including specifications of products, raw materials and materials, production process, auxiliary services, quality assurance, work force, maintenance, hygiene and environmental and industrial safety, organization of warehouses, transportation and distribution.  The potential for energy generation from residues from the management of forest plantations and wood processing residues in Cuba was evaluated.  In addition, the first edition in Cuba of the National Atlas of Bioenergy 2017 was prepared, participated in the preparation of the Atlas, the National Bureau of Statistics and Information, Cubaenergía, the Indio Hatuey Experimental Station and the Livestock, Agroforestry and Labiofam Business Groups. This atlas generates key information to support decisions for the development of bioenergy in the country.  The Atlas is in edition and will be published in July, with a scale of provincial disaggregation, including biogas potential from cattle, pigs and poultry, the potential to substitute 20% of diesel for biodiesel and the potential of forest biomass (waste from management of plantations and sawmill) and rice husk. | A strategy proposal was made to promote biogas in Cuba to the Ministry of Energy and Mines, which was a preliminary proposal aimed at knowing its criteria for improve the proposal for a strategy for the development of bioenergy in Cuba to be delivered in 2020, with specificities for biogas, biodiesel and agricultural and forestry biomass.  This initial proposal reflects the background of the biogas development program in Cuba for the period 2016-2030, its objectives and expected results, scope (installation of industrial and private biodigesters, service providers), activity plan, the coordinating team, the promotion and awareness, technology providers, financial mechanisms, R&D and technical assistance, Monitoring and Evaluation and dissemination of results, as well as institutional aspects.  The existing legal and regulatory framework that supports the development of bioenergy (16 documents) was reviewed and the potential of the existing biogas in Cuba, its equivalence in equivalent tons of oil (TOE in English) and the reduction of CO2 emissions equivalent. All of the above constitutes an opportunity; Likewise, 45 barriers were identified for the development of biogas in Cuba (six of policies and regulations, six institutional, 20 technological, five financial, five of information on the potential of biogas and three of technical and economic information) and 52 solutions are proposed . These barriers are applicable to bioenergy and lignocellulosic biomass in general. To this contributed a Master's Thesis in Energy Technology, presented at the end of 2018.  Elaborated strategy proposal to promote biodiesel in Cuba, together with the Labiofam Business Group of the Ministry of Agriculture, and the BIOMAS project, which will be part of the bioenergy strategy proposal that will be presented in 2020.  The proposal includes the scope of the program, expected results, required investments, economic prefeasibility, productive and economic indicators, planning of biodiesel production, land sowing and irrigation in four provinces, production of associated food, investment costs and all Technical tasks Including product specifications, raw materials and materials, production process, auxiliary services, quality assurance, labor, maintenance, hygiene and environmental and industrial safety, warehouse organization, transportation and distribution.  The potential for power generation from waste from forest plantation management and wood and rice processing in Cuba was evaluated, together with the Agroforestry and Agricultural Business Groups.  The first edition in Cuba of the National Bioenergy Atlas was published, whose official launch to decision makers and specialists was in October 2018, in a workshop. In this edition, the National Office of Statistics and Information, Cubaenergy, the Experimental Station Indio Hatuey and the Livestock, Agroforestry, Agricultural and Labiofam Business Groups participated. This atlas generates key information to support decisions for the development of bioenergy in the country, with a provincial disaggregation scale, including the potential for biogas from cattle, pigs and poultry, the potential to replace 20% of diesel with biodiesel and the potential of forest biomass (waste from plantation and sawmill management) and rice husk.  A study of the opportunities and limitations for the development of bioenergy in Cuba was completed, which was socialized with key actors of Ministries in a workshop in 2019. This study provides key information for the strategy proposal and inputs and policy recommendations that are will deliver to decision makers for their assessment in 2020.  A joint work was initiated in mid-2019 with the Credit and Commerce Bank for the valuation of soft credits to develop bioenergy, and with the Ministry of Finance and Prices to carry out, in conjunction with the Ministry of Agriculture, price proposals for biogas, biodiesel, electricity generated with bioenergy and various co-products.  A process of improvement of the system of collection and analysis of territorial statistical information was organized in 2019, together with the National Office of Information and Statistics (ONEI). This improvement contributes to the collection of information on the next editions of the Atlas of Bioenergy.  In this process, new, more pertinent indicators were conceived to make decisions, in the potential ones and their use of bioenergy and other renewable sources, which includes the new form T14-00 “Survey of Renewable Sources of Energy” of the Territorial Information System, which is being applied as piloting in five municipalities, for its national extension in 2020.  A joint work of ONEI - Empresa Geocuba Guantanamo is carried out to develop a support computer tool based on Geographic Information Systems, which complements the Territorial and National Statistical System, contributes to the new edition of the Atlas and will support local decision making associated with the bioenergy. This software is being validated in Baracoa, municipalitie where form T14-00 is currently being validated. |
| C. MWh/yr produced using biogas and biodiesel attributable to project | C. 0 | *(not set or not applicable)* | C. 1,540.1 MWH/yr | The technical requirements of the equipment and supplies that will be imported to ensure the manufacture of equipment and materials were defined, as well as to complement the experiences of biogas and biodiesel production. Currently, the supplier selection process is executed, for contracting and importing.  Specifically, in the last year: technical tasks of agitators, torches and thermos; also the necessary supplies for these technical tasks. In the bidding process, this year, inputs and / or equipment were incorporated to produce geomembranes, domestic equipment for biogas, biodiesel plants, tractors and agricultural implements, biodiesel tests.  The needs of materials to repair the infrastructure for the installation of biodiesel plants were analyzed. Nurseries of Jatropha curcas seedlings are encouraged and the planting of plantations started. The swine production centers were defined where the construction of biodigesters of covered lagoons will be developed.  From the nurseries, the Jatropha seed farms were planted in both municipalities. In Manatí there are two farms, one of 2 ha and one of 1 ha, in addition to 5 km of Jatropha as living fence to produce commercial seeds for biodiesel in livestock farms, something that has never been done before. In Yaguajay there is a 2 ha farm for seeds. | Although the definition of the technical specifications and the technical requirements of the equipment and supplies that will be imported to guarantee the manufacture of equipment and materials, as well as complementing the experiences of biogas and biodiesel production, have been concluded since 2018, associated challenges remain to the import process; this has demanded that the management of follow-up to the import process has demanded a lot of effort from the Project Management Unit and it is expected by the end of 2019 to culminate a considerable part of it. Currently, the import process is being carried out, in different stages according to equipment and supplies, (in contracting, which includes the process of sending to Cuba, USD 509,000; in bidding USD 289,700; selection of suppliers and search for offers, USD 38,900 ).  The material needs that the Project will cover in repairing the infrastructure for the installation of biodiesel plants, which are in the process of importation or purchasing management in Cuba, were analyzed, as well as the construction remodeling projects.  Conditions are created to promote nurseries of seedlings and farms of Jatropha curcas seeds, although in Manati seedlings of this species are supplied by an existing nursery at the Las Tunas Pasture Station, and planting of plantations begins (seeded 22 ha commercial , in preparation 20 ha, 15 000 seedlings ready to sow) and live fences (2.5 km); In addition, a contract with a cooperative to supply Jatropha curcas seedlings for Yaguajay is prepared.  The pig production centers were defined where the construction of biodigesters will be developed and their design is completed, together with the National Agricultural Projects Company and the investors of the pig companies.  In May 2019, a comprehensive R & D & I (R & D & I) program on Jatropha curcas was organized in conjunction with the BIOMAS-CUBA Project, focused on solving limitations identified and associated with its physiology, genetic improvement, productivity, agronomic management, production and use of biodiesel, use of co-products, environmental studies and economic feasibility.  In addition, new biodigester design alternatives are evaluated, which are more relevant and economical, for medium and small producers, using the geomembranes that will be produced. |
| D. Number of people directly and indirectly benefitted from RE due to project action | D. 0 | *(not set or not applicable)* | D. 88,100 people | 336 people (65 women) have received training in the topics of construction, operation and maintenance of biodigesters, use of biogas; soil preparation., planting, agrotechnics and management of Jatropha curcas plantations to produce biodiesel; installation, operation and maintenance of biodiesel plants, their use and the use of co-products; public energy policies; renewable sources of energy; reduction of social equity gaps in vulnerable municipalities; management of agricultural and forestry biomass for the production of bioenergy through gasification; feasibility of biodiesel, biogas and gasification as technological alternatives for mitigation and adaptation to climate change.  Among the beneficiaries are actors of the project (26), actors and municipal producers (109), professors and researchers (76), decision-makers and officials of ministries and companies (99), as well as producers and manufacturers (26).  The training process will continue to increasingly benefit a greater number of people, workers in the factories that will produce the teams, decision makers and specialists of various Cuban agricultural companies, and more local actors in the municipalities. In addition, the greatest number of people will benefit from the generation of electricity in the covered lagoons that will be used in their homes, as well as the use of domestic biogas equipment.  The average monthly electricity consumption of a house in Cuba is 150 kW.h, our lagoons generate at least 60 kw.h, working 10 hours a day would be 10 hours x 2 lagoons x for 60 kW.h is 1 200 kw.hx 30 days is 36,000 kW between 150 is 240 homes with five average people, 240 homes x 5 people is 1 200 people x 12 months is 14 400 people, at least.  Other beneficiaries will be by the use of biodiesel in agricultural companies and the production of food from its use, as well as the bio-waste resulting from the effluents of the lagoons and the production of food from its use. | 370 people (79 women) have received formal training in issues of construction, operation and maintenance of biodigesters, use of biogas; soil preparation, planting, agrotechnics and management of Jatropha curcas plantations to produce biodiesel; installation, operation and maintenance of biodiesel plants, their use and the use of co-products; public energy policies; renewable sources of energy; reduction of social equity gaps in vulnerable municipalities; management of agricultural and forestry biomass for the production of bioenergy through gasification; Viability of biodiesel, biogas and gasification as technological alternatives for mitigation and adaptation to climate change, opportunities and limitations for bioenergy, and statistical system in bioenergy.  Among the beneficiaries are project actors, municipal actors and producers, professors and researchers, decision makers and officials from ministries and companies, as well as producers and manufacturers.  The training process will continue to benefit more people, farmers, workers in the factories that will produce the equipment, decision makers and specialists of several Cuban agricultural companies, and more local actors in the municipalities. In addition, the greatest number of people will benefit from the generation of electricity and biogas that will be used in their homes, as well as the use of domestic biogas equipment.  The average monthly electricity consumption of a house in Cuba is 150 kW.h, our large biodigesters generate at least 60 kw.h, working 10 hours a day would be 10 hours x 2 biodigesters x for 60 kW.h is 1,200 kw .hx 30 days is 36,000 kW, between 150 is 240 households with five people on average, 240 households x 5 people is 1,200 people x 12 months, at least 14,400 people.  Other benefits will be due to the use of biodiesel in agricultural companies, which contributes to the energy sovereignty of agriculture, and the production of food from its use, as well as the biological waste resulting from the effluents of biodigesters and production of food from its use.  To support the training, an Agronomic Management Manual of Jatropha curcas was prepared, which is in the final editing process, and a biodiesel production manual is prepared. With both manuals, it is expected to directly benefit 310 actors from the productive base, by participating in the project, and, indirectly, another 515, who participate in this theme in allied projects. |
| E. GHG emissions avoided (tons CO2eq). | E. No (0) GHG emission avoided. | *(not set or not applicable)* | E. 6.7 kton CO2eq (direct) and 199.4 CO2eq (indirect) avoided emissions. | The emission of avoided GHG will be measured in the following dates: The first and second assessment of sequestration in Jatropha curcas plantations at the end of 2018 and 2019, the emissions avoided by the production and use of biogas and biodiesel and the third evaluation of the sequestration carbon by the end of 2020.  The potential of biogas production and the avoided GHG emissions in the agricultural sector and the food and sugar industries in Cuba were evaluated. In this process, the national appropriation of the GEF methodology on emission reduction was facilitated. This result generated an article for the magazine Pastos y Forrajes (Web of Science Expanded, SciELO, CAB Abstracts). | Although it was anticipated that the emission of avoided greenhouse gases would be measured on the following dates: the first and second evaluation of the kidnapping in the Jatropha curcas plantations at the end of 2018 and 2019, the emissions avoided by the production and use of biogas and biodiesel and the third evaluation of carbon sequestration at the end of 2020, delays in imports of tractors, implements, tools and agricultural inputs have affected the planting sowing schedule, so the first measurements would be in 2020.  However, due to the experience of the BIOMAS project, a Jatropha tree sequesters 6 Kg CO2 annually, therefore, in 22 ha planted and 833 plants per ha, there are 18 326 plants plus 1 900 in live fences, totaling 20 226, which theoretically sequester 121 356 kg CO2 annually, due to its vegetative state we estimate 25%, that is, 30 339 kg, that is, 30.3 tons per year CO2equiv.  The potential of biogas production and GHG emissions avoided in the agricultural sector and the food and sugar industries in Cuba was evaluated. In this process, national ownership of the GEF methodology on emission reduction was facilitated. This result generated the article Evaluation of the biogas production potential in Cuba, published in the magazine Pastos y Forrajes Vol. 41 No. 2: 85-92, 2018 (Web of Science Expanded, SciELO, CAB Abstracts) https: // payfo .ihatuey.cu |
| **The progress of the objective can be described as:** | | **On track** | | | | |
| **Outcome 1**  **Policy instruments supportive of small-scale bioenergy development have been formulated and recommended for approval.** | | | | | | |
| **Description of Indicator** | **Baseline Level** | **Midterm target level** | **End of project target level** | **Level at 30 June 2018** | **Cumulative progress since project start** |
| 1a) Information tools developed for bioenergy policy and strategy formulation | 1a) No tools existing focused on bioenergy. | *(not set or not applicable)* | 1a) Information tools focused on bioenergies developed at three levels (information gathering, processing and compilation) | Work is being carried out with the National Office of Statistics and Information, at the national level and in the two participating municipalities, to improve the collection of information on the potential of bioenergy and its use in Cuba, which allows the annual edition of the Atlas National Bioenergy as support for local, sectoral and national decision-making. To this end, a work agreement was established between Indio Hatuey and said office. | Since the publication of the first National Atlas of Bioenergy, with the participation of numerous institutions, which generates key information to support the decisions for the development of bioenergy in the country, progress has been made in several actions: i) the definition of that the Atlas will have an annual edition and at the end of the project it will continue to be published by ONEI; ii) a process of improvement of the system of capture and analysis of territorial statistical information was organized, together with the National Office of Information and Statistics (ONEI), where new more relevant indicators were conceived to make decisions, on the potentials and their use of bioenergy and other renewable sources; iii) for this, the new form T14-00 of the Territorial Information System was prepared, which is being applied as a pilot in five municipalities, for its national extension in 2020; and iv) a joint work ONEI - Empresa Geocuba Guantanamo is carried out to develop computer support tools based on Geographic Information Systems, which complement the Territorial and National Statistical System, contribute to the new edition of the Atlas and will support the associated local decision making to bioenergy. |
| 1b) Draft small-scale bioenergy strategy (green paper) consulted with incumbent authorities. | 1b) No draft bioenergy strategy (0) | *(not set or not applicable)* | 1b) Draft strategy compiled and consulted with incumbent authorities (1) | The preliminary evaluation of biogas potential in Cuba was completed; in which a potential of biogas production of 674 609 m³ per day was identified in pig, poultry and dairy cattle and in the food and sugar industries, which corresponds to 127 563 equivalent tons of oil / year, valued at 48.6 million USD. Estimated emissions are calculated by substitution of fossil fuels of 440,779 tons of CO2equiv./year. A more up-to-date assessment will be presented in the National Bioenergy Atlas that will be ready in July 2018.  45 barriers were identified for the development of biogas in Cuba, but extensible to bioenergy, in general (six of policies and regulations, six institutional, 20 technological, five financial, five of information on the potential of biogas and three of technical information and economic) and 52 solutions are proposed to these barriers - these barriers are applicable to bioenergy, and lignocellulosic biomass in general.  Information is processed for the conception of the first version of the draft bioenergy strategy (Green Paper). In this, a Master's Thesis in Energy contributes, which is carried out with the support of the project.  The Green book will be a framework strategy for bioenergy and it is complemented by the specific strategies from biogas, biodiesel and agricultural and forestry biomass, which will be part of this Green Paper. | To ensure that bioenergy is inserted into decision-making at the local, sector and national levels, as part of the national development strategy until 2030, several actions are carried out: i) stable interactions with the Renewable Energy Directorate of the Ministry of Energy and Mines; ii) a working agreement between Indio Hatuey and ONEI, iii) the creation of expert centers in Indio Hatuey, supported by FAO and the Universities of Havana and Humboldt (with a launch with national coaches in the Meliá Habana Libre), as well as in Cubaenergía for advice to manufacturers and farmers, as well as decision makers, to which an expert advisory center is added to local decision makers in the Yaguajay municipality, not foreseen in the project formulation; iv) in June 2019 the BioEnergía incubation process was completed, an organization to provide design, construction, installation and maintenance services of bioenergy production systems, which includes advice and training, with the support of a joint incubator between the Universities from Havana and Humboldt (Berlin), and from FAO, this organization will begin the officialization process, which is complemented by a local expert center in Yaguajay in creation, v) joint work with the Renewable Energy Directorate of the Ministry of Energy and Minas (MINEM), vi) active participation in the Energy Network of the Ministry of Higher Education (MES), as well as in the joint project between MINEM and Cuban and European universities within the framework of the EU-Cuba Program.  The evaluation of the biogas potential in Cuba was completed; in which a potential of biogas production of 674 609 m³ per day in pig, poultry and dairy cattle and in the food and sugar industries was identified, corresponding to 127 563 equivalent tons of oil / year, valued at 48.6 million of dollars. Estimated emissions are calculated by replacing fossil fuels of 440,779 tons of CO2equiv./year.  A more up-to-date evaluation was presented at the National Bioenergy Atlas in 2018, which included the potential for the production and use of biogas, energy from forest and rice residues, as well as the production of biodiesel on idle and lowland land. agricultural potential  45 barriers were identified for the development of biogas in Cuba, but extensible to bioenergy, in general (six of policies and regulations, six institutional, 20 technological, five financial, five of information on the potential of biogas and three of technical information and economic) and 52 solutions are proposed to these barriers, which are applicable to bioenergy and lignocellulosic biomass in general.  Information is processed for the conception of the first version of the draft bioenergy strategy (Green Paper). In this, he has contributed a Master's Thesis in Energy, which was carried out with the support of the project. The Green Paper will be a framework strategy for bioenergy and will be complemented with the specific strategies of biogas, biodiesel and agricultural and forestry biomass, which will be part of this Book. |
| 1c). Policy inputs and recommendations on the legal, institutional and regulatory framework for facilitating the implementation of a small-scale bioenergy strategy. | 1c) No policy inputs and recommendations (0). | *(not set or not applicable)* | 1c) Policy inputs and recommendations formulated and presented to incumbent authorities (1) | The information is processed for the conception of inputs and policy recommendations, with emphasis on legal, institutional and regulatory barriers for the development of bioenergy in Cuba. We reviewed and compiled statistical information and the Cuban legal, regulatory and regulatory framework, consulted policy documents from other countries and Cuba, identified opportunities and barriers. In this, a Master's Thesis in Energy contributes, which is carried out with the support of the project | Information continued to be processed in 2020 to propose inputs and policy recommendations, with an emphasis on solutions to legal, institutional and regulatory barriers for the development of bioenergy in Cuba. Statistical information was reviewed, to which the edition of the Bioenergy Atlas contributed, and of the legal and regulatory framework of Cuba, policy documents from other countries and Cuba were consulted, as well as opportunities identified. In this process he made an important contribution a Master's Thesis in Energy, which was carried out with the support of the project. |
| **The progress of the objective can be described as:** | | **On track** | | | | |
| **Outcome 2**  **State of the art knowledge on the application of small-scale biodiesel and biogas systems has been transferred and assimilated.** | | | | | | |
| **Description of Indicator** | **Baseline Level** | **Midterm target level** | **End of project target level** | **Level at 30 June 2018** | **Cumulative progress since project start** |
| 2a). Production capacity for small-scale (100, 200 and 400l/day) biodiesel plants of national industry (units produced per year). | 2a) No production capacity (0 per year). | *(not set or not applicable)* | 2a) Production capacity for small-scale biodiesel plants (100, 200 and 400 l/day) of 10 units per year. | Task specifications and technical equipment were prepared to create capacities for the construction of biodiesel production plants.  The bidding process for supplies of inputs for the manufacture of plants is in execution.  A workshop was held to identify barriers for the transfer of technologies and possible solutions carried out; where 15 barriers were identified that contain economic and financial, market, political, regulatory, institutional, human, technical and information aspects. | The technical tasks and the specifications of equipment and supplies were prepared to manufacture the biodiesel production plants in the Cubana de Acero Company, which is in search of offers and tenders by the importer.  Conditions were created in Cubana de Acero to install the equipment as soon as they arrive and start production at the end of 2019.  A workshop was held to identify barriers in the transfer of technologies and possible solutions; where 15 barriers were identified that contain economic and financial, market, political, regulatory, institutional, human, technical and information aspects. These barriers are being assessed, together with those identified in the development of inputs and policy recommendations, to find solutions in an integrated way. |
| 2b) Flexible geomembrane production (m2/yr) | 2b) No geomembrane production (0). | *(not set or not applicable)* | 2b) Production capacity for flexible geomembrane material of 68,000 m2/yr. | The investment and feasibility analysis of the creation of capacities for the production of geomembranes for covered digesters biodigesters was carried out, resulting in a pre-feasibility study of the production and the identification of the necessary equipment for the production of geomembranes.  The bidding process for supplies of inputs for the manufacture of plants is in execution.  A workshop was held to identify barriers to technology transfer, which were: insufficient funds for the purchase of inputs, complexity in the acquisition of equipment, and there is still no micro-location, feasibility study and technical tasks - these aspects are currently being worked. | The investment analysis and the prefeasibility of the production of geomembranes for biodigesters in Empresa de la Goma were completed, the main industrial equipment is already contracted, while the auxiliary and laboratory equipment, as well as the raw material for the geomembranes are in process of selection of suppliers and tender.  A workshop was held to identify barriers to technology transfer and possible solutions; where 15 barriers were identified that contain economic and financial, market, political, regulatory, institutional, human, technical and information aspects. For this industry they stand out as challenges to overcome, the complexity in the acquisition of equipment and supplies, because they are specialized for the importing company and the few existing suppliers, but the import process has advanced in 2019. |
| 2c) Litre of biodiesel annually produced in demonstration pilots and put to use (l/yr) | 2c) No production (0 l/yr) | *(not set or not applicable)* | 2c) 127,500 l/yr | The agricultural area was defined to develop the cultivation of Jatropha curcas.  The nurseries of Jatropha curcas seedlings were created in both municipalities, necessary to promote plantations destined to the production of biodiesel.  The planting of Jatropha curcas began.  Material needs were analyzed to repair the infrastructure where the biodiesel production plants will be installed.  An evaluation of the biodiesel produced in Cuba was carried out, with the support of another allied project (BIOMAS) in engine test benches, with excellent mechanical performance and a reduction of emissions with respect to the use of diesel. This result generated an article for the magazine Pastos y Forrajes (Web of Science Expanded, SciELO, CAB Abstracts).  A contract was signed with CIMAB, a transport research center and an agreement with the Agricultural Engineering Research Institute to evaluate biodiesel in agricultural equipment.  We are working on the development of a methodology to evaluate the process of technology transfer for the production and use of biodiesel, with a value chain approach. | Agricultural areas were defined to develop Jatropha curcas plantations. Conditions will be developed to create nurseries of Jatropha curcas seedlings in both municipalities, necessary to promote plantations for the production of biodiesel, although in Manati they receive seedlings from the Las Tunas Pasture Station. The planting of Jatropha curcas began, which already covers 22 ha planted, 20 in preparation and 15 000 ready seedlings, in addition to 2.5 km with Jatropha planted as live fences.  Materials needs were defined to condition the facilities necessary to install seed quality laboratories and for biodiesel production plants.  An evaluation of the biodiesel produced in Cuba was carried out, with the support of another allied project (BIOMAS) in engine test benches, with excellent mechanical performance and a reduction in emissions with respect to the use of diesel. This result generated the article Evaluation of Jatropha curcas biodiesel blends in diesel engine banks, published in the magazine Pastos y Forrajes Vol. 41 No. 4: 300-309, 2018 (Web of Science Expanded, SciELO, CAB Abstracts) https : //payfo.ihatuey.cu  A contract was signed with CIMAB, an environmental transportation research center and an agreement with the Agricultural Engineering Research Institute to evaluate the mechanical and environmental performance of biodiesel in agricultural equipment.  Work was carried out on the development of a methodology to evaluate the technology transfer process for the production and use of biodiesel, with a value chain approach.  Together with BIOMAS-CUBA, the Labiofam company, universities and scientific centers, in May 2019, a comprehensive R & D & I (R & D & I) program on Jatropha curcas was organized to solve limitations identified and associated with their physiology, genetic improvement , productivity, agronomic management, production and use of biodiesel, use of co-products, environmental studies and economic feasibility.  Also, the edition of manuals on agronomic management of Jatropha curcas, and biodiesel production is completed. |
| 2d) Cubic meters of biogas generated in demonstration pilots and put to use (m3/yr). | 2d) No production in demonstration pilots (0 m3/yr)[1] | *(not set or not applicable)* | 2d) 39,400 m3/yr biogas produced. | Culminated technical tasks for the manufacture of agitators and torches for the lagoon biodigester systems covered, and thermos of cooling / conservation of milk using biogas; Work is done on the tasks of the biogas filters and the domestic equipment that will consume it.  The investment and feasibility of the production of geomembranes for lagoon-type biodigesters was analyzed. In addition, the technical specifications of the equipment for its manufacture in Cuba were defined, which are being tendered currently.  The porcine production centers were selected, where the covered lagoon biodigesters will be installed in both municipalities. Progress was made in the design of the biodigesters of this covered lagoon, taking into account the defined production potential.  The training of specialists and other workers who will be responsible for its construction and operation continued.  We are working on the development of a methodology to evaluate the process of technology transfer for the production and use of biogas, with a value chain approach. | Eight technical tasks of the 10 identified were completed. There are still 2 technical tasks to be carried out at the “Marcel Bravo” Factory: CO2 filter and hydrogen sulfide filter for biogas, which are completed in August 2019. Of the 8 technical tasks completed, the identified equipment and supplies are found in Different stages of the import process.  The investment analysis and the prefeasibility of the production of geomembranes for biodigesters in Empresa de la Goma were completed, and the technical specifications of the equipment and supplies were defined. The main industrial equipment is already contracted, while the auxiliary and laboratory equipment, as well as the raw material for the geomembranes, are in the process of selecting suppliers and bidding.  In consideration of the productive changes in the Cuban livestock, together with the designers of the National Agricultural Company and the investors of the pig companies, the final designs of the biodigesters are completed, which will be finished in August 2019, and their implementation depends on imports of equipment and supplies that industrial companies need, as well as the material resources necessary to carry out constructive actions in the municipalities.  The training of specialists and other workers who will be responsible for its construction and operation continued.  We worked on the development of a methodology to evaluate the process of technology transfer for the production and use of biogas, with a value chain approach. |
| **The progress of the objective can be described as:** | | **On track** | | | | |
| **Outcome 3**  **Bioenergy technology diffused through increased knowledge and demonstration of biodiesel and biogas systems.** | | | | | | |
| **Description of Indicator** | **Baseline Level** | **Midterm target level** | **End of project target level** | **Level at 30 June 2018** | **Cumulative progress since project start** |
| 3a) Bioenergy expertise centre established in EEIH. | 3a) Good track record and individual competences on bioenergy within EEIH. | *(not set or not applicable)* | 3a) Formal bioenergy expertise centre habilitated within EEIH. | Efforts are being made to consolidate the EEIH as a national expert center on bioenergy and provide specialized information to professionals from scientific, educational and agricultural entities, producers, municipal authorities and the national government. This information is distributed by E-mail, in workshops, courses and congresses digitally, by Academic Google and other social networks of the project. To improve the socialization of information, conditions are created on the project's website and the development of an accessible database.  A manual was prepared for producers on the agronomic cultivation of Jatropha curcas, already reviewed by the editors and the final printing arrangements are finalized.  In support of the Bioenergy project, a project financed by the National R + D + i Program in Renewable Energy is underway, and in 2019 an innovation project funded by the National Science and Innovation Fund is initiated, both of which contribute 2 , 1 and 2.5 million Cuban pesos, respectively, for four years.  Within the framework of the project, 4 researchers (2 men and 2 women) carry out doctoral studies in management, agronomy and sociology, and belong to the EEIH, the University of Havana and the Ministry of Science, Technology and Environment; the theses will provide knowledge for the management of the bioenergy expert center that is being created in the EEIH. The doctorates have the support of the national projects mentioned.  Participation in the following scientific spaces was encouraged: Cubasolar International Workshop (2016, 2018), II and III Cubaindustria International Convention (2016, 2018), IV International Agro-Development Convention (2016), International Workshop "Knowledge Management Initiative for Sustainability of Development in Cuba (2017), III Course on Cogeneration with hybrid systems for rural electrification, through thermochemical processes (2017), III National Workshop of the Energy Network of the Ministry of Higher Education (2017), IX International Energy Conference Renewable (2017), International Congress of Industrial Engineering (2017, Missions), World Congress of Organic Agriculture IFOAM (2017), International Fair of Renewable Energy (2018), II International Conference on Energy, Innovation and Climate Change (2018), II Pan-American Conference Waste to Energy (2018, Medellin) and III International Agroecology Conference (2018). In the events have been socialized topics and studies related to the project, including integrated production of food and energy, bioenergy, biogas, biodiesel, biomass gasification, incidence in public policies, creation of stakeholder networks, biogas potential, use of sources of renewable energy associated with adequate technologies, among others. The exchange has contributed to give visibility to the project, to socialize its objectives and progress with national and foreign actors, as well as to know the state of the art and practice on technologies and good practices in bioenergy.  Was Participated in: technical meetings with the University of Antioquia and the Metropolitan Technological Institute of Medellín for the signing of collaboration agreements to carry out actions in the implementation of the project; and at the XVII Seminar on Canadian Studies and the Cuba - Canada Workshop: the challenges of climate change. Strategies for its adaptation and mitigation, where the lines of work of the project and the actions that will contribute to the mitigation and adaptation to climate change from its implementation were presented.  Was Participated with a stand at the International Fair of Renewable Energy 2018, where visibility and promotion was given to the project, in addition to establishing dialogues and synergies of work with different national and international institutions that participated in the event. The stand was visited by senior Cuban leaders and ministers.  Was participated in the previous workshop of the international project BIOMAS CUBA PHASE III (COSUDE), where activities and actions were presented in which both projects enter into synergy for common goals, in a strategic alliance that will allow combining actions to strengthen different research and actions of impact.  An exchange was held with a manager of the German company AQUALIMPIA, specialized in covered lagoons, strengthening alliances for the assessment of collaboration perspectives within the framework of the implementation of BIOENERGÍA.  In the International Convention 2018 University and the Workshop on Internationalization of Higher Education, different meetings were held with universities in Brazil and Europe for the preparation and future signing of framework agreements that contribute to the joint development of actions and research for the development of bioenergy in Cuba and the world.  Meeting with the Embassy of the Netherlands, where the goals and actions of the BIOENERGIA and BIOMAS projects were presented, and future meetings were agreed for the analysis of different actions that can be financed by the Embassy.  The project organized a workshop on bioenergy in the II International Conference on Energy, Innovation and Climate Change, Palace of Conventions of Havana, in 2018, with 24 oral presentations.  Was Participated as experts in workshops for the III National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) and the Biennial Report.  A specialist participated in a course on land conservation in Costa Rica, given by the Organization of Tropical Studies and the University of Lisbon, where tools for the protection and sustainable management of soils were received | Work is being done to consolidate a national bioenergy expert center in Indio Hatuey to provide specialized information and expertise to professionals from scientific, educational and agricultural entities, producer manufacturers, municipal authorities and the national government. This information is distributed by email, in workshops, courses and congresses digitally, by Academic Google and other social networks of the project. To improve the socialization of information, conditions are created on the project website and the development of an accessible database.  In order to have an operational structure that supports this center, the BioEnergía-Agri incubation process was completed in June 2019, an organization to provide specialized knowledge and innovation-intensive services, which includes solution design, construction, installation, commissioning progress and maintenance of bioenergy production systems, which includes advice and training, with the support of a joint incubator between the Universities of Havana and Humboldt (Berlin), and FAO, this organization will begin the process of formalization and advise clients from several Cuban provinces, in alliances with other local actors. It has its business model, market research and national and regional competition, CANVAS model and logo; Its slogan is: Intelligent and unique biosolutions for bioenergy and the treatment of your problems with organic waste.  In support of the Bioenergy project, two national projects were formulated, one in 2018 of R & D & I financed by the National Renewable Energy Program, and others in 2019 of innovation funded by the National Science and Innovation Fund, which contribute to 2.1 and 2.5 million Cuban pesos, for four years.  Within the framework of the project, 5 researchers (3 men and 2 women) conduct doctoral studies in administration, agronomy, sociology and information sciences, and belong to the EEIH, the University of Havana and the Ministry of Science, Technology and Environment; The theses will provide knowledge for the management of the center of experts in bioenergy that is being created in Indio Hatuey. Doctorates have the support of the aforementioned national projects.  Participation in numerous international scientific congresses was encouraged, in which project results have been socialized, both in Cuba, Ecuador, Argentina, Brazil and Colombia, in these events topics and studies have been socialized, related to the project, including integrated food and energy production, bioenergy, biogas, biodiesel, biomass gasification, impact on public policies, creation of stakeholder networks, biogas potential, use of renewable energy sources associated with appropriate technologies , among others. The exchange has helped to give visibility to the project, to socialize its objectives and advances with national and foreign actors, as well as to know the state of the art and practices in technologies and good practices in bioenergy. This favors the increase of expertise in support of the operation of the Bioenergy Expert Center, which includes training local actors, companies and ministries, as well as influences decision makers to improve decision making.  Participation in: technical meetings with the University of Antioquia and the Metropolitan Technological Institute of Medellin for the signing of collaboration agreements to carry out actions in the implementation of the project; and at the XVII Canadian Studies Seminar and the Cuba - Canada Workshop: the challenges of climate change. Strategies for adaptation and mitigation, where the lines of work of the project and the actions that will contribute to the mitigation and adaptation to climate change from its implementation were presented.  He participated with a stand at the 2018 International Renewable Energy Fair, where visibility and promotion of the project was given, in addition to establishing dialogues and synergies of work with different national and international institutions that participated in the event; The stand was visited by senior leaders and Cuban ministers.  It acts in integration with the international project BIOMAS CUBA PHASE III (SDC), where activities and actions were presented in which both projects entered into synergy for common objectives, in a strategic alliance that allows combining actions to strengthen different research and actions of impact. The results achieved and the goals of the project were presented at two Agroecology conferences held in Ecuador at the end of 2018 and at the International Animal Production Congress held in Havana in November 2018.  There is an analysis process to hire a specialist from the German company AQUALIMPIA, specialized in geomembrane biodigesters, to assess their employment alternatives and diversify their use in Cuba.  At the 2018 International Convention of the University and in the Workshop on Internationalization of Higher Education, different meetings were held with universities in Brazil and Europe for the preparation and future signing of framework agreements that contribute to the joint development of actions and research for development of bioenergy in Cuba and the world.  Meeting with the Embassy of the Netherlands, where the objectives and actions of the BIOENERGY and BIOMAS projects were presented, and future meetings were agreed for the analysis of different actions that can be financed by the Embassy.  The project organized a workshop on bioenergy at the II International Conference on Energy, Innovation and Climate Change, Palacio de Convenciones de La Habana, in 2018, with 24 oral presentations.  Project members participate as experts in workshops for the III National Communication of Cuba to the United Nations Framework Convention on Climate Change (UNFCCC) and the Biennial Report, 2019.  Two theses associated with bioenergy were carried out as a master thesis in Energy Technology that contributes to a national strategy of Biogas Development, with a technical, economic and policy vision; and a thesis in Mechanical Engineering, on a maintenance system for electric generators that operate on biogas.  All this technical exchange at national and international level has allowed us to gain experiences in support of the operation of the Expert Center in Bioenergy. As a result of this process, this Center, still in the process of constitution, has provided the following services: i) prepare the proposal for a diploma in bioenergy, ii) write manuals on agronomic management of Jatropha and biodiesel production, iii) work on the design of biodigesters, iv) perform several training actions, v) the incubation process of BioEnergía-Agri, vi) advise industrial companies to elaborate their technical tasks associated with the project, and vii) Geocuba to design an ICT tool for support for the collection and processing of information on bioenergy.  This approach to take advantage of the participation in congresses, workshops and courses to build capacities in the creation of this expert center and in the specialists that make it up, was a suggestion of the Regional Technical Advisor at the PIR 2018. |
| 3b) Number of farmers (m/f) assisted on bioenergy. | 3b) No (0) farmers assisted. | *(not set or not applicable)* | 3b) 120 farmers assisted | 109 municipal actors from productive agricultural activity and producers trained in the production and use of biogas and biodiesel; This training was extended to 99 decision-makers and officials of the business groups of the Ministry of Agriculture and other organizations related to the sector, and also included the use of agricultural waste for the generation of electricity and heat.  Weekly, in the local radio stations of the two participating municipalities, Yaguajay and Manatí, news related to the local actions of the project are provided; the communicators of both territories keep the statistics of said news. | 196 (42 women) municipal actors of productive agricultural activity and producers formally trained in the production and use of biogas and biodiesel, as well as in the improvement of the territorial information system. This training was extended to 99 decision makers and officials of the business groups of the Ministry of Agriculture and other organizations related to the sector, and also included the use of agricultural waste for the generation of electricity and heat.  Weekly, news related to the local actions of the project are provided at the local radio stations of the two participating municipalities, Yaguajay and Manati; The communicators of both territories keep the statistics of said news.  Additionally, both municipalities use social networks to disseminate the actions and progress of the project. As a contribution to the training of producers, two manuals were prepared, as well as a course (qualified course) on Bioenergy which was designed to be develop throughout the country, in alliances with universities, to achieve institutional sustainability. This diplomat is under review. |
| 3c) Number of advisory/consulting services provided by Cubaenergía to decision-makers on bioenergy | 3c) On average 3 services on bioenergy provided per year | *(not set or not applicable)* | 3c) 8 services on bioenergy provided per year | Last year was provided 8 technical services. in the present year has been provided 6 technical services. 1 Technical Service: Update on biogas and biodiesel to decision makers and specialists:  It supported and contributed to the organization of a national energy seminar to support decision making, with 63 participants. Four presentations of the experiences obtained in biodiesel and biogas were made. 2 Technical Service: Update on biogas and biodiesel to decision makers and specialists from Enterprise Group of the Ministry of Agriculture: A training workshop was held on biodiesel and biogas for national decision makers, with 70 participants. 3 Technical Service: Specific Training to decision makers and specialists on biogas, biodiesel and gasification of agricultural and forest waste. Three courses were held for decision makers and specialists of the Enterprise Groups of the Ministry of Agriculture (Cattle, Agroforestry, Agricultural and Labiofam), on biogas, biodiesel and gasification of agricultural and forest waste, 99 attendees. They highlighted people from the technical, productive, economic and investment areas of these groups and their companies. | In 2017 and June 2019, nine technical services on bioenergy have been provided annually to decision makers, which include: 1) the biogas update for national decision makers and specialists; 2) the update on biodiesel for national decision makers and specialists; 3) support for the national energy seminar to support decision-making, with 63 participants (four presentations were made of the experiences gained in biodiesel and biogas); 4 and 5) the update on biogas and biodiesel for decision makers and specialists of the Business Groups of the Ministry of Agriculture, in training workshops on biodiesel and biogas for national decision makers, with 70 participants; 6, 7 and 8) Specific training for decision makers and specialists in biogas, biodiesel and gasification of agricultural and forest waste; For this, three courses for decision makers and specialists of the Business Groups of the Ministry of Agriculture (Livestock, Agroforestry, Agriculture and Labiofam), on biogas, biodiesel and gasification of agricultural and forest waste, 99 attendees (highlighted people from the areas) technical, productive, economic and investment of these groups and their companies); 9) the publication of the National Bioenergy Atlas, a tool to support decision making.  To help advise national, sectoral and local decision makers, a process to improve the system of collection and analysis of territorial statistical information was organized, together with the National Office of Information and Statistics (ONEI), where new more relevant indicators were conceived to make decisions, in the potential and its use of bioenergy and other renewable sources, which includes the new form T14-00 of the Territorial Information System, which is being applied as a pilot in five municipalities, for its national extension in 2020 Additionally, a joint work of ONEI - Empresa Geocuba Guantanamo is carried out to develop computer support tools based on Geographic Information Systems, which complement the Territorial and National Statistical System, contribute to the new edition of the Atlas and will support the associated local decision making to bioenergy. |
| **The progress of the objective can be described as:** | | **On track** | | | | |

# Implementation Progress



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| Cumulative GL delivery against total approved amount (in prodoc): | 28.02% |
| Cumulative GL delivery against expected delivery as of this year: | 28.02% |
| Cumulative disbursement as of 30 June (note: amount to be updated in late August): | 766,990 |

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| **Key Financing Amounts** | |
| PPG Amount | 50,000 |
| GEF Grant Amount | 2,737,524 |
| Co-financing | 19,949,107 |

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| **Key Project Dates** | |
| PIF Approval Date | Apr 8, 2013 |
| CEO Endorsement Date | May 4, 2015 |
| Project Document Signature Date (project start date): | May 16, 2016 |
| Date of Inception Workshop | Oct 6, 2016 |
| Expected Date of Mid-term Review | Jan 10, 2019 |
| Actual Date of Mid-term Review | *(not set or not applicable)* |
| Expected Date of Terminal Evaluation | Sep 30, 2019 |
| Original Planned Closing Date | May 14, 2021 |
| Revised Planned Closing Date | *(not set or not applicable)* |

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| **Dates of Project Steering Committee/Board Meetings during reporting period (30 June 2018 to 1 July 2019)** |
| 2018-07-18 |
| 2019-04-22 |

# Critical Risk Management

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| Current Types of Critical Risks | Critical risk management measures undertaken this reporting period |
| Operational | *(not set or not applicable)* |
| Operational | Critical Risk: Insufficient execution of the GEF funds, due to: 1) delays in the national approval of the project (approval of the GEF May 4, 2015; approval of the Cuban Government to begin the process of signing of Terms of Reference, October 8, 2016; signature of the Terms 4 January 2017 that define the start date of the execution of the project), and 2) delays in the process of acquisition / import of equipment, supplies and technologies. This process was developed until the end of 2017 by the Donation Executing Company (EMED) of the MINCEX. At the beginning of 2018 that company was dissolved and its staff joined another company of that ministry, Consumimport, which is now the importer of the project. Several tenders of offers and that were technically approved by the specialists of the industries to proceed to their hiring and to be able to carry out the importation (with considerable amounts of financing), ceased to be valid and therefore the process began from the beginning, the search for offers. In this new context, mitigation measures were taken, such as the implementation, since the end of 2018, of monthly follow-up meetings on imports between Consumimport, Project Management, UNDP, MINCEX and the MONTH, as well as sessions of work with high frequency with the importer and the actors of the project, to evaluate each one of the processes of importation, which has accelerated, relatively, the imports.  Actions undertaken:  1. Continue with the monthly monitoring between UNDP CO Cuba and the Project Management Unit to monitor the progress of the GEF import / financial execution process (prior to meeting with other stakeholders).  2. Develop a monthly monitoring of the financial import / execution process of the GEF, convened by UNDP Cuba CO, together with the Project Management Unit, the GEF Political and Operational Focal Point, the International Economic Organizations Directorate (DOEI) of the Ministry of Foreign Affairs, Foreign Trade and Investment (MINCEX) and the importing company of the MINCEX Consumimport, to which it was added to carry out work sessions with the importer and the actors of the project, to evaluate each of the import processes .  3. To reduce the time required to establish specifications of the necessary equipment and supplies, as well as technical analyzes, by the project actors responsible for their products and results. |

# Adjustments

**Comments on delays in key project milestones**

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| **Project Manager: please provide comments on delays this reporting period in achieving any of the following key project milestones: inception workshop, mid-term review, terminal evaluation and/or project closure. If there are no delays please indicate not applicable.** |
| Initially, the execution of the project was affected by the gap between the GEF approval dates (May 4, 2015) and the approval process by the Cuban entities to begin the process of signing the Terms of Reference (October 8, 2016), which was carried out on January 4, 2017 and defines the start date of project execution. There were also some delays in the process of acquisition / import of equipment, supplies and technologies.  This process was developed until the end of 2017 by the Donation Executing Company (EMED) of the MINCEX; At the beginning of 2018 that company was dissolved and its staff joined another company of that ministry, Consumimport, which is now the importer of the project.  Several tenders of offers and that were technically approved by the specialists of the industries to proceed to their hiring and to be able to carry out the importation (with considerable amounts of financing), ceased to be valid and therefore the process began from the beginning. However, there are currently USD 821,000 in the process of bidding, receiving offers and technical analysis to contract with the suppliers that are selected. In this regard, management and control measures for this risk have been established. 28% of the financing of the project has already been executed, and, at the moment, important equipment is already hired, such as those of the rubber industry, tractors and agricultural implements, laboratory equipment, chemical reagents, various tools and other equipment and supplies, for 383 300 USD. In addition, it is in the process of contracting or completing the tender 234 400 USD, as well as 132,000 USD in bidding or selection of suppliers with contract before the end of the year, totaling 749 700 USD, whose execution would increase the execution of the project to 56%, at the end of 2019. |

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| **Country Office: please provide comments on delays this reporting period in achieving any of the following key project milestones: inception workshop, mid-term review, terminal evaluation and/or project closure. If there are no delays please indicate not applicable.** |
| The field mission of the Mid-Term Review (MTR) took place in this period. At current the Evaluation Team are working in the new Draft version taking into account the recommendations from Project Management Unit (PMU), UNDP CO and UNDP Regional Technical Center (Energy, Infrastructure, Transport and Technology). |

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| **UNDP-GEF Technical Adviser: please provide comments on delays this reporting period in achieving any of the following key project milestones: inception workshop, mid-term review, terminal evaluation and/or project closure. If there are no delays please indicate not applicable.** |
| MTR should have started in January 2019 and after some delays, the first draft was delivered in July and is being reviewed. |

# Ratings and Overall Assessments

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| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **Project Manager/Coordinator** | Moderately Satisfactory | *- IP Rating provided by UNDP-GEF Technical Adviser and UNDP Country Office only -* |
| Overall Assessment | Progress is made in Outcome 1, in the collection and analysis of information on bioenergy; the development of statistical information systems to support policies and strategies, which will be based on new local collection models (for the first time that they obtain information from the basic production units) and on computer tools supported by geographic information systems); in the evaluation of the technical and economic potential, as well as the formulation of policies and their instruments; highlights the publication of the first National Atlas of Bioenergy.  Progress is made in Outcome 2, in: 1) creating conditions to establish seed banks of Jatropha curcas; 2) evaluate biodiesel in engine test benches and determine technical conditions and parameters for application in tractors, as well as the completion of durability studies of engine components; 3) the development of evaluation methodology for the process of transfer of technologies for the production and use of biodiesel and biogas, with a value chain approach; 4) the identification of barriers to technology transfer, the development of technical tasks for the manufacture of equipment and supplies for biogas and biodiesel systems; 5) the elaboration of the technical tasks of the equipment and materials that will be produced within the framework of the project, which include the list of the needs to be imported, in the hands of Consumimport, which are both in the process of being sent to Cuba, hiring, selection of suppliers, bidding, as in search of offers; 6) the beginning of planting of Jatropha plantations; 7) the training, which includes producers, local decision makers and business ministries and groups, to support the implementation of biogas and biodiesel systems in the two municipalities.  Progress is made in Outcome 3, in the creation and strengthening of technical capacities through the training of various national and local actors, in the development of training materials, in actions for the creation of the EIHH expert center, supported by the incubation of a bioenergy services company, and an advisory unit to decision makers and to share information and knowledge about bioenergy in Cubaenergy, the establishment of networks of specialists and producers in the two municipalities, as well as in the communication of the project conception and of its results in numerous congresses, workshops and courses. Likewise, a 2017 Agenda of the project was designed and printed, together with BIOMAS-CUBA, which was delivered to numerous actors linked to both projects and Renewable Energy Sources, with great acceptance; two newsletters are distributed quarterly and the main activities are disseminated in different media and in social networks.  Two national support projects were formulated, with considerable financing in national currency.  Progress is made in Outcome 4, by creating a project management structure, at the national and municipal levels, as well as in the selection of the impact indicators, effects and products of the M&E System.  The co-financing of Cuban counterparts and international co-financing projects has been used; in the first case, 2 145 077 Cuban pesos have been executed (26% of the planned, execution affected by the fact that the industries have not yet executed their contribution, having not received equipment and supplies for import delays); in the second, 1 882 932 USD in equipment and facilities contributed totally by co-financing projects.  Work was carried out on all the activities planned in the 2017-19 POA, as well as the first half of 2019, of which, in Outcome I, its five products have been worked on (with emphasis on the first three); in Result II, the six products are advanced; and in the similar result III in the four products.  Of 225 activities planned in the POA 2017, 2018 and first half of 2019, 112 were completed until planned annually (49.8%), 72 in the process of compliance (32.0%) and 41 not yet fulfilled (18.2% ); in non-compliance or in process there has been a great influence of import delays.  The project actors have benefited from the alliances facilitated by the Project, in interaction with Cuban counterpart institutions and other international cooperation initiatives to develop working relationships with the Ministries of Energy and Mines, Agriculture, Economy and Planning, Education Superior, Industries, Science, Technology and Environment, and Foreign Trade and Foreign Investment, with various business groups and local governments in Yaguajay and Manati and other organizations and institutions, which mostly participate in the project. This allows contributing to the fulfillment of its objectives.  The project since its inception is endorsed by several national authorities with competences in the areas of renewable energy and environment, the business sector, as well as local and provincial government authorities.  There is a close relationship between the project team and the UNDP Country Office, since the formulation process, this has allowed systematic monitoring and financial execution of the project. Likewise, several meetings and workshops have been held between the national coordination team and the remaining participating actors, this includes government officials and other local actors in Yaguajay and Manatí. In addition, work sessions have been carried out to monitor the project in these municipalities. | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **UNDP Country Office Programme Officer** | Moderately Satisfactory | Moderately Unsatisfactory |
| Overall Assessment | DO RATING - MS    This is the third PIR of the Bioenergy project. In the previous evaluation a Moderately Satisfactory rating was given by UNDP CO in line whit RTA and team project, taking into account it was considered despite the project was on track to achieve its objective by closure there was some shortcomings related to the procurement process.    To this period the project keep its difficulties on procurement process with negative impacts in six (6) indicators at project objective and outcome 2 levels. UNDP CO in line with project team rate DO as Moderately Satisfactory, as the project is on track to achieve its end-of-project targets with minor shortcomings.    The specific indicators progress status is the following:  - Adequate progress indicators (7): B, 1a), 1b), 1c), 3a), 3b) and 3c).  - Limited progress indicators (2): D and 2b).  - Delay progress indicators (6): A, C, E, 2a), 2c) and 2d).    However, it is consider the project is on track because there is important progress at outcome 1 and 3 levels and at outcome 2, indicators 2b) regarding flexible geomembrane production. Also, it has been defined the measures to be develop by the Project Management Unit (PMU) at outcome 2 level aimed to achieve its end-of-project targets. It is important to take note some of the progress at outcome 1 and 3 levels contribute to the institutional sustainability of the project results.    Outcome 1. All of its Indicators are showing adequate progress. In this period has guarantee the national appropriation of the Atlas on Bioenergy tool taking into account the National Statistics and Information Office has adopted at national levels the procedure to collect the information on "Renewable Energy Sources" including Bioenergy requirements of information. This is and important advanced towards the institutional sustainability of the project results (See in File Library Section: "T14-00 Fill" and "Methodological Instructions to apply the T14-00 Fill"). This fill contribute to improve the Atlas on Bioenergy tool in its new editions.    It was identifies 15 barriers to technology transfer and its possible solutions (in order of economic and financial, market, political, regulatory, institutional, human, technical and information aspects). This information will be use to continue working in the elaboration of a draft methodology to technology transference on biogas and biodiesel, reported like started in PIR 2018. Project team has initiated the elaboration of proposal of Soft Credit like one of the solutions to promote the biogas and biodiesel production around the country. In this has start working alliances with the Ministry of Finance and Price (MFP) and Credit and Commerce Bank (BANDEC).    Outcome 2. All of its Indicators are showing limited or delayed progress. The mains results in this outcomes to this period is the develop of the "Investment Analysis and the Prefeasibility Study" on production of geomembranes for biodigesters. Also the project has avanced in Jatropha curcas plantations. The planting of Jatropha curcas began, which already covers 22 ha planted (5 ha was reported in 2018), 20 ha in land preparation and 15 000 ready seedlings, in addition to 2.5 km with Jatropha planted as live fences. In this sense the PMU should analyze the specific recommendations of the Mid-Term Review once the Final Report be received. 8 technical tasks of the 10 identified were completed. There are still 2 technical tasks non completed (CO2 filter and hydrogen sulfide filter for biogas). It is expected conclude it in August 2019. This issue need a specific follow with the national actor from industry sector who is responsible for develop this technical task (“Marcel Bravo” Factory).    Outcome 3. All of its Indicators are showing adequate progress. In this year have been provided 9 technical services of the 8 defined in ProDoc per year; also it have assisted 196 (21% women) local actors from productive agricultural activity, almost is fulfilled the end project target defined to indicator 3b). The project team has elaborate the proposal of the Formal Bioenergy Expertise Centre (BioEnergía-Agri). Also was elaborate the proposal of Course on Bioenergy to be develop in alliances with universities around the country. Both BioEnergía-Agri and Course on Bioenergy contribute to institutional sustainability of the project results. (See evidences in File Library section).    New alliances was establish in this period: Two national projects were approved, one in 2018 (a R & D & I project: $2.1 USD) financed by the National Renewable Energy Program, and others in 2019 ($2.5 USD) financed by the National Science and Innovation Fund (FONCI, by its abbreviation in Spanish).    Main results in this period: (Note: The mains results 1, 2 and 3 contribute to the institutional sustainability of the project results).    1.- It was adopted at national levels the "T14-00 Fill" asprocedures to collect the information on "Renewable Energy Sources" including Bioenergy.    2.- It was elaborate the proposal of the Formal Bioenergy Expertise Centre (BioEnergía-Agri).    3.- It was elaborate the proposal of the Course on Bioenergy.    4.- It was develop the "Investment Analysis and the Prefeasibility Study" on production of geomembranes for biodigesters.      IP RATING - MU    In this evaluation period the fulfillment of the main monitoring milestones of the project were achieved with the quality required. For example: PIR report 2018 and POA 2018/2019). An annual (learning lesson) workshop to review project progress was held with the participation of all provinces, industry sectors, other stakeholders and UNDP CO.    Planned activities compliance /Annual work plan 2017 – 2018 (only first semester) : fulfillment 49.8%; partially fulfillment 32.0 and not yet fulfilled 18.2%. Monthly meetings with the outcome coordinators and the sectors representatives involved were held to adjust and supervise all tasks.    UNDP CO develop a field mission monitoring on April 2019 (before NSC). It was verify a locals actors commitments with the project and at the same time the challenges whit the procurement process as well as its negative impacts in the project implementation.    A National Steering Committee (NSC) meeting was held in April 2019 with the participation of the Regional Technical Advisor – Energy, Infrastructure, Transport and Technology. Two meetings of the NSC are planned in 2019. The next one it is scheduled to be organized by November, 2019.    The field mission of the Mid-Term Review (MTR) took place in this period. At current the Evaluation Team are working in the new Draft version taking into account the recommendations from Project Management Unit (PMU), UNDP CO and UNDP Regional Technical Center (Energy, Infrastructure, Transport and Technology).    The Social and Environmental Screening Procedure was update in this period. Four (4) environmental risk was identified one of which like a moderate risk. It was elaborate the Social and Environmental Management Plan.    However the project faces accumulated delays in relation to the financial implementation:  According to ProDoc, by the end of Year 3 (June 2019) the cumulative disbursement should be $ 2,271,642 (83% of the total project budget). The real disbursement shows $ 766,990 USD, representing 33,7% of the planned figure in ProDoc ($ 1,651,542) and 28% of the total project budget. (Project has a delay on GEF financing execution: $1,504,652 USD).    It was develop the management measures to a critical risk identified. To end 2019 it is expected to disbursement increase taking into account the current amount (749 700 USD) in procurement process, which it is expected increase the GEF financing execution to 56%.    Specific procurement process phase are the following:  - Contract signed: $383 300 USD  - Contract process: $234 400 USD  - Tender process: $132 000 USD    Risks:    The low level of financial execution associated to procurement process is considering the main risk that threatens the implementation of the project. This delay represent a negative impacts at outcomes 2 levels, as well as 4 of 5 indicators at project level objectives.    To enhance the financial execution the project team are supporting and maintaining a permanent exchange with CONSUMIMPORT (the new importing company). With the same purpose, in this PIR period the UNDP CO has organized 5 financial review meetings in which MES (International Relations Office, Project Management Unit –PMU–), MINCEX and the importing company have participated. These meetings were focused on the analysis and monitoring of all national import and purchasing processes. In those meeting were adopted agreements to accelerate planned financial implementation.    However additional management measures should be taking to speed up the procurement process and the GEF financing execution taking into account the project end date is May 2021 and has executed just around a quarter of total project budget, until June 2019.    Recommendations:    In order to support and monitor the financial execution of the project, it is highly recommended that PMU jointly with UNDP CO, MINCEX, MES, and CONSUMIMPORT, continues organizing the operational meetings. Also, It is recommended the National Executive Agency ("Indio Hatuey") made a systematic follow of the Bioenergia UNDP/GEF project through its Board Direction.    It is highly recommended the National Executive Agency ("Indio Hatuey") develop an specific meeting “Marcel Bravo” Factory, national actor from industry sector who is responsible for develop two technical tasks non completed (CO2 filter and hydrogen sulfide filter for biogas). | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **GEF Operational Focal point** | *(not set or not applicable)* | *- IP Rating provided by UNDP-GEF Technical Adviser and UNDP Country Office only -* |
| Overall Assessment | *(not set or not applicable)* | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **Project Implementing Partner** | *(not set or not applicable)* | *- IP Rating provided by UNDP-GEF Technical Adviser and UNDP Country Office only -* |
| Overall Assessment | *(not set or not applicable)* | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **Other Partners** | *(not set or not applicable)* | *- IP Rating provided by UNDP-GEF Technical Adviser and UNDP Country Office only -* |
| Overall Assessment | *(not set or not applicable)* | |
| **Role** | **2019 Development Objective Progress Rating** | **2019 Implementation Progress Rating** |
| **UNDP-GEF Technical Adviser** | Moderately Satisfactory | Moderately Unsatisfactory |
| Overall Assessment | This is the second PIR of the project ‘Clean Energy in Cuba - Strategies for sustainable technology innovation and transfer of low carbon energy technologies in Cuban rural areas’. The project has the objective to increase access to bioenergy technology in Cuba by promoting the use of biodiesel and biogas technologies by rural farmers. After some delays to start the MTR (planned to start in January 2019) the project managed to deliver by July the draft report, which supports the review of current year’s PIR.  Regarding development objective progress, policies for technology transfer have not yet been adopted, but a methodology for this transfer was developed. Proposals for small-scale bioenergy policies are being prepared to be submitted by the Project for the consideration of the Ministry of Energy and Mines and the Ministry of Agriculture. The first edition of the National Bioenergy Atlas 2017 was published, which contains valuable information on national potential for bioenergy production. The target of indicator B is ‘four policies mechanisms adopted’.  A group of technical tasks related to indicator A (Products based on the technology transfers that are approved by the relevant authorities for commercial manufacturing) has been developed. The lists of equipment, supplies and materials are still being imported and are facing delays despite close monitoring of steering committee and Country office. Some are in the conceptual design phase (stirrers, torches), others are only sketches (milk coolers, pots, household refrigerators). No prototypes available yet and no finished product to this indicator.  Yet no MWh from biogas and production biodiesel can be attributed to project activities. According to MTR Project has not yet established commercial Jatropha plantations, it is unlikely that the production of seeds, oil and biodiesel will begin before 2020/2021. Project claims there are 22 ha commercially seeded, 20 ha in preparation, 15 000 seedlings ready to sow, and 2.5 km live fences. Biodigesters with the geomembranes to be manufactured in Cuba have not yet been built, due to import delays. The pig production centers were defined where the construction of biodigesters will be developed and their design is completed according to project team, however few evidences of those designs were provided. These designs should acknowledge the needs and profiles of small and mid-size animal production.  The number of people directly and indirectly benefitted from the project is closely linked to the generation of energy (target 88,100 people). UP to now the beneficiaries are mainly the trained stakeholders (370 people -79 woman). MTR claims that no material on training for cultivation and management of Jatropha was identified. It is expected that once the plantations and seed orchards are functioning as expected, this training will be done. Proven that the amount of Jatropha plants have been planted, project shall achieve the indirect emissions due to sequestration, however assumptions for targets should be screened to fine tune yield production in Cuba with possible generation capacity.  PIR language is hard to understand and some info differ from the verified data presented by MTR. In line with MTR and project team RTA considers Development Objective Progress as Moderately Satisfactory. Project is on track to achieve its end-of-project targets, however there might relevant shortcomings related to the production of biodiesel (due to the need to consolidate the seedings and Plantations) and possible delays in building biodigesters. Project should take adaptive management measures to guarantee that the conditions to deliver end of project targets and expected impacts are in place.  Outcome 1 aims to formulate and recommend for approval policy instruments supportive of small-scale bioenergy development and is one of the most advanced components. The final version of the Opportunities & Limitations Diagnosis has been produced and published in mid-2019. Regarding systems of data collection to generate draft strategy and green paper, a partnership with ONEI was established to design and plan the data system. To validate and analyze the information collected it is envisioned to work with samples from 5 municipalities. Geocuba is also working on the development of a software tool based on Geographic Information System.  The Bioenergy Atlas was developed and is a contribution to the proposal of a regulatory and public policy framework for the development of bioenergy by small and medium agricultural producers. It is important to consider MTR’s review on Jatropha performance assumptions in project implementation and adjustments as well as in the Bionenergy Atlas. For the next versions, as it will be published annually, it is importan to evaluate the economic potential or viability of some sources of biomass or crops that could be developed. The enabling conditions and baseline assessments to generate policy instruments seem to be on track in this outcome.  MTR recommends the project to urgently implement the international consultancies planned to support this result. It also recommends verifying and validating, with field surveys and remote sensor information, the information used in the National Atlas and the pilot models for the evaluation of potentials and opportunities for biodiesel and biogas production at the municipal level.  Outcome 2 - State of the art knowledge on the application of small-scale biodiesel and biogas systems has been transferred and assimilated – present many shortcomings and delays in implementation according to project and MTR reporting. No targeted results by project end such as production capacity in Liters/day of biodiesel, nor geomembrane material ( target 68,000 m2/yr), or m3/yr biogas have been produced. This outcome has been greatly affected by delays in imports of equipment, components and inputs for the national industry.  Besides the delays in imports, according to MTR this outcome has been structure with wrong assumptions that might generate relevant shortcomings on project overall results. Those are mainly related to the production of biodiesel from Jatropha. It is therefore important to work on adaptive management measures and in adjusting the baseline info to avoid these possible negative impacts. A specific safeguard issue also related to Jatropha production must be closely coordinate, the toxic residues generated by biodiesel generation form Jatropha, demand careful management and a mitigation plan for these residues should be developed to the areas being cultivated with Jatropha.  According to MTR, from the two (2) seed farms registered in the municipalities selected by the project, only Manatí is partially sown and growing, although the acquisition and installation of the corresponding irrigation systems has not been completed. The two areas of seed production that are being established will go into full production probably by 2021, so there might be no significant production of certified Jatropha seeds before 2021, and if this is achieved it will only allow planting up to about 1 000 ha /year in 2022. Thus, the pilot demonstrations of the use of biodiesel may not begin on the scheduled date in the municipalities selected in the project, because they do not have enough crops to produce biodiesel in their own facilities; they must wait until 2022-2023, to have enough crops and be able to produce biodiesel. MTR recommends an urgent re-seeding of the 2 planned seed farms registered in the municipality of Yaguajay. RTA urges objective and straightforward measures to address these delays and adjust the strategy and work plan for biodiesel generation by the project. Besides technical solutions a detailed assessment of risks and mitigation measures to biodiesel production should be drafted.  Pilot demonstrations of small-scale biodiesel and biogas technologies to generate MW/h and l/yr also depend on the equipment to be imported. An international consultant should be hired to support the establishment of a national system to produce certified seeds. The MTR also recommends for this outcome to establish a collection, identification and registration of the “mother plants” from which the seeds and cuttings will be obtained for the seed orchards, rigorously monitoring their seed production, sanitation, growth habit, response to pruning. As identified by the evaluation team, nurseries must be provided with the essential basic supplies: polyethylene bags for pots, substrates, fertilizers, pesticides, irrigation equipment and minor tools.  Bioenergy technology diffused through increased knowledge and demonstration of biodiesel and biogas systems is the aim of outcome 3. This outcome is the more advanced in the project. The national expert center on integrated bioenergy production has been conceptualized correctly and now the project is in its implementation stage. This Center, still in the process of constitution, has provided the following services: i) prepare the proposal for a diploma in bioenergy, ii) write manuals on agronomic management of Jatropha and biodiesel production, iii) work on the design of biodigesters, iv) perform several training actions, v) the incubation process of BioEnergía-Agri, vi) advise industrial companies to elaborate their technical tasks associated with the project, and vii) Geocuba to design an ICT tool for support for the collection and processing of information on bioenergy. The project has also assisted 196 municipal actors of productive agricultural activity (target 120 farmers supported) and has reported the provision of nine technical services to decision makers.  RTA in line with project team considers IP rating as moderately Unsatisfactory. Implementation is not proceeding as planned and faces significant implementation issues, mainly related to the acquisition of imported equipment. To conclude in the remainder of the year the process of buying approved equipment and machinery, as well as irrigation systems for farms is key to put project implementation on track and also to guarantee satisfactory range for DO progress next PIR. Implementation progress could be improved if adaptive management is undertaken immediately. Cumulative financial delivery against total approved amount (in prodoc) is 28.02% and key implementation milestones, and/or management of critical risks are significantly off track. After the MTR report in finalized and the process finished, Project must elaborate a management response and structure a strategy together with the government to address the appropriate concerns raised by the evaluation team. | |

# Gender

**Progress in Advancing Gender Equality and Women's Empowerment**

This information is used in the UNDP-GEF Annual Performance Report, UNDP-GEF Annual Gender Report, reporting to the UNDP Gender Steering and Implementation Committee and for other internal and external communications and learning.  The Project Manager and/or Project Gender Officer should complete this section with support from the UNDP Country Office.

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| **Gender Analysis and Action Plan:** *not available* |
| **Please review the project's Gender Analysis and Action Plan. If the document is not attached or an updated Gender Analysis and/or Gender Action Plan is available please upload the document below or send to the Regional Programme Associate to upload in PIMS+. Please note that all projects approved since 1 July 2014 are required to carry out a gender analysis and all projects approved since 1 July 2018 are required to have a gender analysis and action plan.** |
| *(not set or not applicable)* |

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| **Please indicate in which results areas the project is contributing to gender equality (you may select more than one results area, or select not applicable):** |
| Contributing to closing gender gaps in access to and control over resources: No |
| Improving the participation and decision-making of women in natural resource governance: Yes |
| Targeting socio-economic benefits and services for women: Yes |
| Not applicable: No |

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| **Atlas Gender Marker Rating** |
| **GEN1:** some contribution to gender equality |

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| **Please describe any experiences or linkages (direct or indirect) between project activities and gender-based violence (GBV). This information is for UNDP use only and will not be shared with GEF Secretariat.** |
| n/a |

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| **Please specify results achieved this reporting period that focus on increasing gender equality and the empowerment of women.**    **Please explain how the results reported addressed the different needs of men or women, changed norms, values, and power structures, and/or contributed to transforming or challenging gender inequalities and discrimination.** |
| The report describes progress in relation to gender and equity gaps. Tours were carried out through the scenarios and productive bases that allowed raising the baseline of the project, assessing the incorporation of women and youth in the different stages of the project and identifying gender gaps to design actions that allow work related to equity in municipalities of Yaguajay, Manatí and Cubaenergía.  The awareness actions have been carried out with the development of 20 workshops aimed at executives of the companies of the Base Business Unit (UEB), MINAGRI leaders, women, men and students of the communities where the project scenarios are located. The topics were aimed at raising awareness about indicators that promote equity in the sector, renewable energy and its impact on reducing gender gaps in community and family projects. It is possible to integrate the work team of the municipality, under the leadership of the local government, with the representatives designated by each participating institution.  In the activities carried out, in the municipalities of Yaguajay, Manati and Cuba-Energy, a total of 679 inhabitants have participated, including 250 women, 429 men, 301 whites, 128 blacks, people with different abilities, 32 children, 60 young people up to 40 years, 360 adults and 18 older adults.  The main activities developed are listed below:  • The Equity Action Plan (SAP) and the Annual Operating Plan (POA) were prepared.  • Participates in 2 Course-Workshop with the Nicolás Guillen Foundation (FNG) in the Dominican Republic. Related to the use of renewable energies, the reduction of gender and social equity gaps in municipalities vulnerable to climate change.  • The Workshop was held: First steps in the Transversalization of the Social Equity Approach to the Bioenergy Project.  • The initial diagnosis of opportunities and limitations was made: technological, economic, social and environmental.  • The Second Workshop on Bioenergy Potential and Opportunities and limitations was carried out, in the line of Biodiesel, Biogas and Forest Biomass, from the economic, social and environmental dimension.  • Was exchange with administrators and workers of the UEB on indicators that promote equity in the sector.  • Awareness workshop with women in the area on the issue of equity and identify the main aspirations of women and men that relate to the real possibilities of improving their status and position in their personal, social and economic life.  • A presentation on the results of the Bioenergy project on gender issues was presented at the III National Workshop on Hydrographic Basins.  • The information disaggregated by gender and social equity in the beneficiary municipalities was collected.  • The equity gap related to the problem of access to and consumption of drinking water, environmental pollution is evidenced, along with marked disadvantages from the variable gender, territoriality and disability.  • Art is identified as one of the most interesting potentialities found in the municipality of Manatí and the opportunity to use culture as a tool to raise awareness in a participatory way to respond to the project objectives from the environmental dimension and the production of linked food with renewable energy sources.  • Exchange visits were made to communities that work on issues related to agriculture, and bioenergy from hydroelectric and ecotourism development.  • It was exchanged with officials of the Dominican Institute of Integral Development, which promotes microcredits for social promotion and other aspects that seek sustainability. Work experiences in biofuel project were known from the Jatropha curcas where they have a seed germplasm bank in the institute. The Ministry of Environment and Natural Resources of the Government of the Republic was visited, where programs are being developed that are being carried out based on environmental care, developing ecotourism and renewable energies focused on energy saving policy.  • In this own country, exchanges were made on possible actions that allow applying the gender perspective to disaster management, among which are: combating the feminization of diseases such as dengue, Zika and Chicungunya, carrying out a permanent reforestation plan for watersheds in which women participate actively, encourage the participation of women in the construction of sustainable infrastructure and resilient to climate change, create technical training programs that empower rural women as leaders and as multipliers of production initiatives friendly to environment, climate change, and in the installation of systems of renewable energy  Other activities developed are related to:  • The celebration of women's day, day of the Cuban peasantry and the environment, with the participation of members of the UEB and members of the community.  • The circle of interest on Biodiesel and the environment was created, with the incorporation of children from the area  • Students work with equity issues and vocational training in relation to biodiesel, environmental conservation to promote the inclination towards careers prioritized by the municipality.  • Participation of the pioneers of the circle of interest is organized in the ACTAF municipal workshop, with the objective of exchanging with agricultural and forestry technicians about the current circumstances for the care and conservation of the environment.  • The project coordinating team participates in the exercise for the evaluation of bioenergy potential and its monitoring ” for make a proposal of adaptation of the municipal statistical system that allows the collection of the required information on the potential of bioenergy, its use and provide this information to the decisions of the territory.  • Workshop to identify the main aspirations of women and men that relate to the real possibilities of improving their condition and position in their personal, social and economic life.  • Awareness Workshop to assess the incorporation of women and youth to the implementation of projects  • 20 women are incorporated into the planting activity of Jatropha curcas seeds in bags to promote in the nursery. (February / 2019  • Workshop. Vision of gender roles. Bioenergy project team and students of the Sociocultural Management career.  • Workshop. Exchange of experiences on the opportunities offered by agriculture in terms of equality and equity to establish relationships of just couples. Bioenergy project team and workers of the Provincial Company of Flora and Fauna.  • Workshop on socialization of the gender and energy theme.  • Realization of a workshop on the socialization of gender and energy experiences within the framework of the projects that CUBAENERGIA executes  • Participates in the project risk and opportunity workshop  • Participates in the midterm evaluation process of the project  • Government officials, executives and students are given a conference on the characteristics and manifestations of gender violence.  • Methodology to evaluate the contribution of the use of renewable energy sources to the reduction of gender gaps. Author: Alina Martínez  • Publication in event: Martínez. A, Curbelo. A, Jiménez. O. (2018). The problem of gender, energy and food security. ”Energy, Innovation and Climate Change Conference. Science Convention Convention Palace Havana Cuba. ISBN 978-959-7231-04-2. Note: Need for a gender approach. Alina Martinez Technical bulletin of technology transfer in Bioenergy for decision makers No.2, 2019.  • The article: The participatory social diagnosis for the identification of social equity gaps is published in the Social Equity Book. Methodological recovery of the diagnostic workshop in the Manatí municipality, Las Tunas. Authors: Ileana Núñez Morales and Glensy Palay Alonso.  • There were 4 activities in the Day for nonviolence &quot;You are MORE&quot;  16 dissemination actions were carried out on the radio, the intranet of the University of Santi Spíritus (UNISS) and on the local television of Yaguajay and Manatí and on the different social networks to give visibility to the activities developed on equity and energy by the project .  • The Collaboration Agreement between the Experimental Station Indio Hatuey and the Nicolás Guillen Foundation in the Dominican Republic was signed.  • Work alliances were established with the Latin American Faculty of Social Sciences (FLACSO), with the Nicolás Guillen Foundation, CUBAENERGIA and ACTAF. |

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| **Please describe how work to advance gender equality and women's empowerment enhanced the project's environmental and/or resilience outcomes.** |
| During this period, we worked to provide technical assistance to the focal points and project managers, so that they integrated the equity approach into their work, all of which facilitated the collection of data related to the social aspects related to the environment and use of bioenergy.  Tours were made through the scenarios and productive bases by the focal points and the coordinators of the territories, where the program will be implemented. The diagnosis of equity and energy was made and work was carried out on the development of the baseline of the project, possible actions on the topic of equity are identified in the first phase of the project, training was given on issues related to family participation and the focus of gender involved in the energy sector and its planning.  The activities carried out during the execution of the project, contribute to the effective decision making for the realization of activities and inclusive actions, with the empowerment of women in each scenario, to reinforce the resilience in each scenario of the project, from the point of view sociocultural and environmental with the contextualization of appropriate technologies for the efficient use of local resources and bioenergy, to increase energy efficiency, reduce the use of conventional energies and the emission of greenhouse gases, and cross-sectionalize empowering women and men on equal terms and with shared responsibility in each action. |

# Social and Environmental Standards

**Social and Environmental Standards (Safeguards)**

The Project Manager and/or the project’s Safeguards Officer should complete this section of the PIR with support from the UNDP Country Office. The UNDP-GEF RTA should review to ensure it is complete and accurate.

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| **1) Have any new social and/or environmental risks been identified during project implementation?** |
| Yes |

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| **If any new social and/or environmental risks have been identified during project implementation please describe the new risk(s) and the response to it.** |
| It was updated the Social and Environmental Screening Procedure (See in File Library &quot;Social and Environmental Screening Procedure updated&quot;).    Note:  - 2014: Date first time was applied the Social and Environmental Screening Procedure to the project / sign date: 25th, February 2015. |

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| **2) Have any existing social and/or environmental risks been escalated during the reporting period? For example, when a low risk increased to moderate, or a moderate risk increased to high.** |
| No |

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| **If any existing social and/or environmental risks have been escalated during implementation please describe the change(s) and the response to it.** |
| *(not set or not applicable)* |

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| **SESP:** [Cuba PIMS 4899 CleanEnergy ESSP Screening 23-Sep-2014.docx](https://undpgefpims.org/attachments/4899/213651/1675020/1675308/Cuba%20PIMS%204899%20CleanEnergy%20ESSP%20Screening%2023-Sep-2014.docx)  **Environmental and Social Management Plan/Framework:** *not available* |
| **For reference, please find below the project's safeguards screening (Social and Environmental Screening Procedure (SESP) or the old ESSP tool); management plans (if any); and its SESP categorization above. Please note that the SESP categorization might have been corrected during a centralized review.** |
| [SESP 22052019.pdf](https://undpgefpims.org/attachments/4899/213651/1728275/1742771/SESP%2022052019.pdf) |

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| **3) Have any required social and environmental assessments and/or management plans been prepared in the reporting period? For example, an updated Stakeholder Engagement Plan, Environmental and Social Impact Assessment (ESIA) or Indigenous Peoples Plan.** |
| Yes |

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| **If yes, please upload the document(s) above. If no, please explain when the required documents will be prepared.** |
| It was elaborated a &quot;Social and Environmental Managements Plans&quot; taking into account a Moderate risk was identified during the Social and Environmental Screening Procedure update. (See in File Library &quot;Social and Environmental Management Plan&quot;). |

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| **4) Has the project received complaints related to social and/or environmental impacts (actual or potential )?** |
| No |

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| **If yes, please describe the complaint(s) or grievance(s) in detail including the status, significance, who was involved and what action was taken.** |
| *(not set or not applicable)* |

# Communicating Impact

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| **Tell us the story of the project focusing on how the project has helped to improve people’s lives.**  **(This text will be used for UNDP corporate communications, the UNDP-GEF website, and/or other internal and external knowledge and learning efforts.)** |
| Sowing future  To the birds, wings; fins for fish; to the men who live in Nature, the knowledge of Nature: those are their wings. To the sixth grade pioneers of the José Antonio Echeverría Bianchi center in Narcisa, the necessary knowledge about clean energy to radiate in their school and in their community.  Kids already knew about the environment, soil care, green awareness, agroecology, forest reforestation, food security and the devastating effects of climate change. They have been part of the Cuban Association of Agricultural and Forestry Technicians (ACTAF) and the UNDP / European Union Project Environmental Bases for Local Food Sustainability (BASAL) as key actors in their own improvement.  And, as his teacher Graciela says, “You have to keep in mind that the teacher's work goes beyond the classroom. Those little ones never bother me, nor do they approach me in search of clarification. Thus I want to train the new generations. I look forward to the teachers of the future. ”  When Ivania, the University professor, arrived and asked them to form a Circle of Interest in Bioenergy, their faces looked as confused as they were curious. He assured them that through the use of biogas and small-scale biodiesel, benefits were obtained such as: reducing greenhouse gas emissions, contributing to diversifying the town's energy matrix, making proper management of the residuals that have spread in the environment they pollute it, creation of new sources of employment, revitalization of backward communities.  To the surprise of the little ones, the educator showed them a black bag (of which they use reforesting lemon) with a sown plant; but this time it was a posture of Jatropha curcas. He told them, as he passed by each table showing it closely, that this tree species was going to be the fundamental raw material for producing biofuel.  And not only that! he exclaimed, it is also used traditionally for the treatment of bacterial and fungal infections or for diseases with febrile episodes, muscle pain or jaundice. Batey children who have suffered scratches, sores or skin lesions are improved using their leaves.  Although it is possible to say more than the wonderful thing about the meeting, the truth is that from that incitement the first activity emerged: a visit to the Bioenergetic Technology Transfer Unit at the University Center of the town. What a long name! They said loudly. However, next Monday they were there as someone waiting for an explanation. The university community welcomed them in their lap, presented them with promotions of the Bioenergy / Cuba Project, projected videos of Jatropha curcas full production to obtain fuel and cosmetics, using organic waste to produce energy.  Sinai, the project coordinator, let them know that to accompany the process of transfer and assimilation of biodiesel and biogas technologies; and in turn, supporting the decision-making process at the local level was the mission that the Center had to fulfill. And you, boys, your task will be from the desk, in the garden, in the neighborhood; He told them vehemently.  What struck Claudia the most was knowing how the redisuos of her brother's pigs will no longer pollute the air because it can be used to generate energy and fertilize the earth; his mother, who now cooks with blight or oil, can do his housework better and faster; and his dad who is a farmer can use the fuel to ensure cultural attention to his crops.  Before leaving the classroom, each one took the Convocation of the Renewable Energy Sources Contest. |

**Knowledge Management, Project Links and Social Media**

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| **Please describe knowledge activities / products as outlined in knowledge management approved at CEO Endorsement /Approval.**    **Please also include: project's website, project page on the UNDP website, blogs, photos stories (e.g. Exposure), Facebook, Twitter, Flickr, YouTube, as well as hyperlinks to any media coverage of the project, for example, stories written by an outside source. Please upload any supporting files, including photos, videos, stories, and other documents using the 'file lirbary' button in the top right of the PIR.** |
| There is a communication strategy designed by the project team with the objective of making the GEF, the UNDP and the Cuban partners in the reduction of greenhouse gas emissions generated by fossil fuels visible at national and international level.  From the execution of this strategy there is participation of BIOENERGÍA in social networks, for example in Facebook https://www.facebook.com/bioenergiaCUBA where a rich exchange is maintained on the actions of the project and topics related to bioenergy with a growing number of interested and followers.  In addition, you have a space at www.linkedin.com/in/proyecto-bioenergia-55908a152  A YouTube channel linked to the email address of the project bioenergia.17@gmail.com was created  Some videos made by the project's communication group are highlighted, such as: https://www.youtube.com/watch?v=2FsbQTRNrUk and https://www.youtube.com/watch?v=r3o3wrR1K50  Several videos are planned from the new stage, and the new impacts on the implementation of the project.  In addition, there is a Google Academic space in the project's Gmail, where important scientific articles related to the use of bioenergy are shared and received, which contribute to the research and the group of experts created by the project.  Also with the aim of raising the visibility of the project and its participants, each member has been asked to create their profiles in academic Google networks (https://scholar.google.com.cu [1] /) and ResearchGate (https://www.researchgate.net [2] /), where they would include in their profiles that they are members of the GEF-UNDP Bioenergy Project and would make the full text available to them, so that it can be consulted by all the members.  Several promotional articles have been distributed among the members and benefited by the project, such as shirts, hats, folders, agendas, etc., which has motivated in different spaces the exchange with other actors of the society who are attracted by the logo or the message of these products. In this sense, the use of the visual identity of the project has also contributed to the presentation in congresses, courses, events, meetings, etc.  During the stage since the last report in July 2018, at least one weekly news item has been shared on the Facebook page https://www.facebook.com/bioenergiaCUBA, reaching 727 friends who are still on the rise, with which is maintained an active chat related to the themes of the project and the publications made. The project team has been empowered in this initiative and from the territories and in the different activities carried out, the beneficiaries of the project publish and share the main results in their walls and in the Bioenergy one. In this way it is reaching an audience of more than 10,000 people in each publication.  A new video of a workshop on Jatropha curcas was uploaded to YouTube: https://www.youtube.com/watch?v=cKoien05oew&feature=youtu.be  Several articles have been generated, in synergy with the BIOMAS project, in the Google Scholar of the project, which can be viewed at https://scholar.google.com.c/citations?user=fAmCoyEAAAAJ&hl=en  In addition, from the interaction with academic Google, more than 100 articles have been received that allow the study of the state of the art and practice in bioenergy, which are also shared by the project email.  A thematic digital library linked to bioenergy has been developed, most of the articles in Open Access in GBC Bioenergy.  The information of the Bioenergy project has been included in the profiles of the project leaders.  Promotional articles have been distributed at this stage that continue to favor interaction with a diverse audience on the issues of Bioenergy Cuba.  Within the territories there are several actors inserted in the dissemination and visibility of the project, in weekly spaces on local stations and television stations and in the insertion in educational spaces of primary and secondary schools.  In several international congresses the expected results and those achieved in the implementation of the project have been exposed, also participating with banners and informative products in specialized stands.  In addition, scientific articles of a practical and social nature have been published in different popular scientific journals and in an book, the latter as a result of the collaboration agreement made with the Nicolás Guillén Foundation. A space is also opened at the present time for the dissemination of gender and energy, in the magazine Energía y Tú, with the aim of publishing testimonies of women benefiting from the project.  The project has a quarterly publication Bulletin, already with five issues published, which has a list of users of 700 people, which is gradually increasing at the will of new stakeholders.  It is estimated that each Bulletin reaches more than 10,000 people, as it is published and shared by email contacts and social networks, also on the project page https://bioenergia.ihatuey.cu  Other spaces such as the Web pages of the University of Sancti Spíritus, national radio and television and some provinces, are spaces where several of the activities carried out have been disseminated, for example http://www.tvsantiago.icrt.cu/ 2018/10 / cuba-make-first-national-atlas-of-bioenergy /  http://www.cu.undp.org/content/cuba/es/home/presscenter/articles/2018/10/24/cuba-confecciona-primer-atlas-nacional-de-bioenerg-a.html  http://www.tvsantiago.icrt.cu/tag/bioenergia/  http://www.acn.cu/ciencia-y-tecnologia/33779-fomentan-aprovechamiento-energetico-de-la-biomasa-forestal  https://www.sica.int/noticias/satisfechos-cubanos-con-intercambio-con-costa-rica-sobre-biogas\_1\_108901.html  https://www.ihatuey.cu/?page\_id=928  http://www.cubaenergia.cu/index.php/files/30/XV-SENAE/56/Present.-proy.-Bioenergia-Taller-Cubaenerg.-Nov.-2017.pdf  A Diplomat Program: Integrated Food and Energy Production Systems is being approved, in conjunction with the BIOMAS project. |

# Partnerships

**Partnerships & Stakeholder Engagment**

Please select yes or no whether the project is working with any of the following partners. Please also provide an update on stakeholder engagement. This information is used by the GEF and UNDP for reporting and is therefore very important!  All sections must be completed by the Project Manager and reviewed by the CO and RTA.

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| **Does the project work with any Civil Society Organisations and/or NGOs?** |
| Yes |

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| **Does the project work with any Indigenous Peoples?** |
| No |

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| **Does the project work with the Private Sector?** |
| Yes |

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| **Does the project work with the GEF Small Grants Programme?** |
| Yes |

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| --- |
| **Does the project work with UN Volunteers?** |
| No |

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| **Did the project support South-South Cooperation and/or Triangular Cooperation efforts in the reporting year?** |
| Yes |

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| **CEO Endorsement Request:** [For submission Cuba PIMS 4899 CEO end 10-oct-2014.docx](https://undpgefpims.org/attachments/4899/213651/1675047/1675309/For%20submission%20Cuba%20PIMS%204899%20CEO%20end%2010-oct-2014.docx) |
| **Provide an update on progress, challenges and outcomes related to stakeholder engagement based on the description of the Stakeholder Engagement Plan as documented at CEO endorsement/approval (see document below). If any surveys have been conducted please upload all survey documents to the PIR file library.** |
| Progress: Working agreements were consolidated with the National Office of Statistics and Information (ONEI) and the Local Government in two municipalities of intervention (Manati and Yaguajay).    Challenges: It is expected to establish working agreement with the Ministry of Finance and Price (MFP) and Credit and Commerce Bank (BANDEC) aimed to promote soft credit to support bioenergy production in Cuba. |

# Annex - Ratings Definitions

**Development Objective Progress Ratings Definitions**

(HS) Highly Satisfactory: Project is on track to exceed its end-of-project targets, and is likely to achieve transformational change by project closure. The project can be presented as 'outstanding practice'.

(S) Satisfactory: Project is on track to fully achieve its end-of-project targets by project closure. The project can be presented as 'good practice'.

(MS) Moderately Satisfactory: Project is on track to achieve its end-of-project targets by project closure with minor shortcomings only.

(MU) Moderately Unsatisfactory: Project is off track and is expected to partially achieve its end-of-project targets by project closure with significant shortcomings. Project results might be fully achieved by project closure if adaptive management is undertaken immediately.

(U) Unsatisfactory: Project is off track and is not expected to achieve its end-of-project targets by project closure. Project results might be partially achieved by project closure if major adaptive management is undertaken immediately.

(HU) Highly Unsatisfactory: Project is off track and is not expected to achieve its end-of-project targets without major restructuring.

**Implementation Progress Ratings Definitions**

(HS) Highly Satisfactory: Implementation is exceeding expectations. Cumulative financial delivery, timing of key implementation milestones, and risk management are fully on track. The project is managed extremely efficiently and effectively. The implementation of the project can be presented as 'outstanding practice'.

(S) Satisfactory: Implementation is proceeding as planned. Cumulative financial delivery, timing of key implementation milestones, and risk management are on track. The project is managed efficiently and effectively. The implementation of the project can be presented as 'good practice'.

(MS) Moderately Satisfactory: Implementation is proceeding as planned with minor deviations. Cumulative financial delivery and management of risks are mostly on track, with minor delays. The project is managed well.

(MU) Moderately Unsatisfactory: Implementation is not proceeding as planned and faces significant implementation issues. Implementation progress could be improved if adaptive management is undertaken immediately. Cumulative financial delivery, timing of key implementation milestones, and/or management of critical risks are significantly off track. The project is not fully or well supported.

(U) Unsatisfactory: Implementation is not proceeding as planned and faces major implementation issues and restructuring may be necessary. Cumulative financial delivery, timing of key implementation milestones, and/or management of critical risks are off track with major issues and/or concerns. The project is not fully or well supported.

(HU) Highly Unsatisfactory: Implementation is seriously under performing and major restructuring is required. Cumulative financial delivery, timing of key implementation milestones (e.g. start of activities), and management of critical risks are severely off track with severe issues and/or concerns. The project is not effectively or efficiently supported.