



**PROJECT IMPLEMENTATION REPORT (PIR)
FY 2021**

GEF - IDB

IMPORTANT: The reporting period is GEF Fiscal Year (July 1st, 2020 to June 30th, 2021)

of PIR: 8th

PROJECT GENERAL INFORMATION

Project Name:	Promotion and Development of Local Wind Technologies in Mexico		
Project's GEF ID:	4132	Project's IDB ID:	ME-X1011 GRT/FM-13249-ME
Executing Agency:	The National Electricity and Clean Energy Institute (INEEL)		
Project financial information:	Date of First Disbursement	06/7/2013	
	Total disbursements of GEF Grant resources as of end of June 30 th , 2021 (cumulative)	US\$ 3,493,328.14	
Project dates:	Agency Approval Date	05/15/2012	
	Effectiveness (Start) Date	08/15/2012	
	Original Last Disbursement Expiration Date ¹ (OED)	02/15/2017	
	Current OED	11/30/2021	
	Estimated Operational Close Date ² (EOC)	02/28/2022	
	Actual Date of EOC, if applicable		
Project evaluation:	Mid-term Date (Expected)	06/30/2015	
	Terminal evaluation Date (Expected)	01/31/2022	

¹ For the GEF, this is equivalent to the project's "Expected Completion Date".

² For the GEF, this is equivalent to the project's "Expected Financial Closure Date".

DEVELOPMENT OBJECTIVE RATING (DO) & ASSESSMENT

Make an overall assessment and provide a rating³ of “likelihood of achieving project objective” during the period (2020-2021). Describe any significant environmental or other changes attributable to project implementation.

OVERALL (DO) ASSESSMENT	RATING
<p>The general objective of the Project is to enable the local development of wind turbines and its components for Distributed Generation (DG) and contribute to enhance Mexico’s local capacities in wind energy technology. Based on the experiences of other countries, it is reasonable to expect that extensive exploration and improved wind speed measurements throughout the country, will result in higher estimates of Mexico’s wind energy potential. To achieve this goal, a prototype 1,2 MW Class IA wind turbine with a high component of national technology and manufacturing is planned to be developed.</p> <p>The proposed project has been structured in four components: 1) design and specification of wind turbine components; 2) procurement, manufacturing, and assembly of the components; 3) erection, starting-up and operational testing of the wind turbine; 4) capacity building and institutional strengthening to promote wind power market through DG by small power producers (SSPs).</p> <p>During the period of evaluation, the project was expected to be completed. However, during the period of this evaluation some key milestones have been added to the challenges of the project, because of the change of Federal government and the restrictions imposed by COVID-19.</p> <p>Additionally, on October 2020, the Government of Mexico approved the termination of 109 local trust funds, one of which was the CONACYT-SENER Energy Sustainability Fund, which represented the source of counterpart resources of the project. An amount of US\$13.6 of local counterpart was originally contemplated under this project of which 47.4% was already disbursed and 52.6% will not be disbursed. The National Electricity and Clean Energy Institute (INEEL), the Executing Agency, has confirmed that due to the unavailability of the total counterpart resources, the assembly and installation of the 1.2MW wind turbine prototype will be pending.</p> <p>Under this scenario the project is expecting to achieve most of its major relevant objectives, but with significant shortcomings. Thus, its development objective rating for this period is Marginally Satisfactory (MS).</p> <p>During the evaluation period 2019-2021, the Executing Agency has mainly focused on completing the milestones related to the blade manufacturing for the wind turbine. This is the last product committed to be delivered with the grant resources.</p>	MS

³ See Annex 1: Definition of Ratings.

<p>During the evaluation period, the main advances were concentrated in the manufacture of the molds and other devices necessary for the manufacture of the blades, as well as in the processes of acquisition of the different material inputs and equipment required for the same purpose. These advances will be able to be implemented because of a disbursement extension until November 2021.</p>	
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IMPLEMENTATION PROGRESS RATING (IP) & ASSESSMENT

Make an assessment and provide ratings⁴ of overall Implementation Progress, including information on progress, challenges and outcomes on project implementation activities from July 1st, 2020 until June 30th, 2021. As applicable, please include **information on issues and solutions related to COVID-19.**

OVERALL (IP) ASSESSMENT	RATING
<p>Overall, for the period 2020-2021, the project’s implementation progress rating granted was: Marginally Satisfactory (MS) given the level of achievement of outcomes per component, which are detailed as follows:</p> <p>Component 1 - Design and specification of wind turbine components. Completed</p> <p>According with the results expected, design and specifications of the prototype have been accomplished at 100%.</p> <ul style="list-style-type: none"> • Aero elastic pre-design. Completed. • Basic Engineering. Completed. • Detailed design of components (mechanical, electric, and civil works) and turbine subsystems (rotor, power train, generator, power controls, etc.). Completed. • Review of the design by external experts. Completed. • Elaboration of Operation, Maintenance and Safety Guidelines. Completed. • Preparation of documents for certification of the wind turbine design. Completed. <p>Component 2 - Procurement, manufacturing, and assembly of the components. In progress.</p> <ol style="list-style-type: none"> 1. Manufacturing of the wind turbine tower: Product duly completed and delivered to the CERTE. Execution 100%. 2. Construction of the wind turbine foundations. Pending due to local counterpart budget constraints. 3. Manufacturing of wind turbine blades: The National Research Centers CIATEQ and CIDESI have successfully completed the design of the wind blades and are currently advancing on the manufacturing process. 	<p>MS</p>

⁴ See Annex 1: Definition of Ratings.

There is progress, documented by the CIDESI, in the development of activities related to the structural design of different components of the blades, such as: pressure and suction sides molds, root mold, leading and outlet edges molds and stringers molds. There is also progress in the documentation required for the design certification process. These is the fundamental input for manufacturing, testing, and documenting the blades for the MEM wind turbine.

CIDESI concluded the design of nineteen tools that will be used for carrying out different kind of maneuvers during the manufacturing of the molds and the blades. CIATEQ has already manufactured fourteen of these tools.

CIATEQ successfully completed a risk reduction testing for using a Mexican paste in the manufacturing of molds; this was carried out by manufacturing a six meters blade as well as of the 18 sections for master model of the 30 meters blade. The use of the Mexican paste is one of the most successfully facts in technical risk management, because there was not possible to purchase the idoneous compound in the international market.

In the CIATEQ workshops the manufacture of eighteen sections required for the completion of the blade master model were finished; this was carried out using computer aided manufacturing (CAM). The master model for the 30 meters blade is already completed and available for starting the manufacturing of the molds.

The following activities are in progress: i) the manufacturing of structures for the molds of the shells of the blades (suction and pressure sides); ii) procurement of the materials, consumables, and equipment for implementing the infusion process for molds and blades; iii) completion of the required documents for certification of the design of the wind turbine blade.

Component 3 - Erection, starting-up, and operational testing of the wind turbine.
Pending.

These activities will not be executed within the current expiration date of the grant agreement as they depend highly on the confirmation by the Government of the disbursement of the pending local contribution.

Component 4 - Capacity building and institutional strengthening to promote wind power market through DG by small power producers (SSPs). **Completed**

All activities under this component have already been completed and reported in previous PIR.

On March 30th, 2020, the Mexican Government declared national emergency due to COVID-19. Immediate suspension of all non-essential activities caused that limited the capacity of the INEEL-CIATEQ-CIDESI personnel to work in-situ on the manufacturing of the blades. This announcement has impacted the project execution as follow:

<ul style="list-style-type: none"> • Highly risk people were not allowed to be in work centers. In the CIATEQ, 40% of the most experienced workers associated to the project was vulnerable people. As a response new younger staff were recruited and trained. • Delay in the provision of some key materials and equipment by suppliers. During the pandemic’s peak period the supply of specialized materials and equipment was put on hold by suppliers. In 2021, deliveries are suffering delays, and in many cases, it is becoming more challenging to find suppliers that meet the technical requirements, delivery times, guarantees and bonds conditions, which resulted in longer procurement processes and, in other cases, it limited purchases to only one supplier. • During 2020 no new promotion activities were carried out due to the COVID-19 pandemic. Among the postponed/cancelled activities was a training workshop scheduled for the second semester of 2020 in Querétaro, México. 	
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RISK RATING & ASSESSMENT

Make any adjustments necessary to the assessment ratings⁵ of overall Project Risk⁶ that you provided in the last PIR (2019-2020). Please include details and remedial measures for High and Substantial Risks, specifying who will be responsible for these measures.

OVERALL RATING FOR PROJECT RISK	RATING
<p>Some risks previously identified have materialized. Under this scenario the project is expecting to achieve most of its most relevant objectives but with significant boundaries. Therefore, for the period 2020-2021, the overall risk rating is maintained as Substantial (S).</p> <p>Such risks still are: (i) delay in the completion of the blades during 2021, and (ii) non 100% recovery of the advance granted to TEMACO for the manufacturing of the blades. The impact of such risks is analyzed hereafter:</p> <p>Components 2 – Delay in the manufacturing of two blades.</p> <p>Reasons of the delay: Delay in the provision of some key materials and equipment by suppliers. During the pandemic’s peak period the supply of specialized materials and equipment was put on hold by suppliers. In 2021, deliveries are suffering delays, and in many cases, it is becoming more challenging to find suppliers that meet the technical requirements, delivery times, guarantees and bonds conditions, which resulted in longer procurement processes and, in other cases, it limited purchases to only one supplier.</p> <p>Actions implemented: Weekly follow-up meetings are held in which the INEEL, CIATEQ and IDB teams participate, including procurement specialists. As a result of these meetings, key</p>	S

⁵ See Annex 1: Definition of Ratings.

⁶ These should include risks identified at CEO Endorsement AND any new risks identified during implementation.

acquisitions are identified and, where appropriate, problems are anticipated in the supply of supplies and services, to find and implement actions to solve them.

Components 2 – Recovery of the advance granted to TEMACO

Reasons: The execution of the contract for the manufacturing of the wind turbine blades was awarded to the local company TEMACO who was selected for showing enough capacity to carry out the design and manufacturing of a set of 5 blades for the MEM project. However, TEMACO was unable to meet key milestones in the contract. TEMACO requested an extension for the completion of the contract during 2020, but they missed the renewal of a commercial bank guarantee that would allow the approval of the said extension by INEEL. The contract with TEMACO was not renewed, and the company argues that they have already spent all the resources granted as an advance.

Actions implemented: Under the termination of the contract with TEMACO, a review process from INEEL’s legal, financial, and technical teams is under way, aiming to recover, a proportion of the advance granted.

Until the date of this report, TEMACO has not been able to fully comply with the verification of expenses of the first and unique advance of USD 300,000, so the legal processes starting with the conciliation between INEEL and TEMACO must be carried out. In case an agreement is not reached, an arbitration will have to be carried out by a qualified third party, and based on this, TEMACO will have to return to INEEL the expenses that are not recognized. If TEMACO does not accept it, INEEL will proceed to claim the reimbursement by means of the bond, which will back up to 100% of the advance.

It is estimated that the recovery of resources through the application of the bond will exceed the period of conclusion and closing of the operation, which implies the need to establish an additional agreement with INEEL to continue with the process after completion and closing of the operation.

GENDER

Please add information on any progress, challenges and outcomes with regards to any and all gender-responsive measures that were undertaken in the project's activities during the 2020-2021 GEF Fiscal Year. Also: Were indicators on gender equality and women's empowerment incorporated in the project's results framework? (Yes/No). If applicable, include the indicator with its baseline, target and current value (2020-2021).

No. There is not any gender indicator included in the original result matrix of the project. However, IDB and INEEL have agreed on the importance of promoting gender equality during the execution of the resources. Considering the handcraft skills of the women of Oaxaca, INEEL considers the participation of a group of local women during the process of manufacturing of the blades. INEEL has already carried out a series of workshops through which it also seeks to identify such local capacities. However, the change of location to manufacture the blades from Juchitán to Querétaro, as well as the restrictions imposed by the COVID-19 pandemic, will not allow Juchitán personnel to be incorporated into the blade manufacturing process.

STAKEHOLDER ENGAGEMENT

Please add information on any progress, challenges, and outcomes with regards to stakeholder engagement, based on the project's activities during its implementation through the 2020-2021 GEF Fiscal Year. As applicable, please include **information on issues and solutions related to COVID-19.**

The INEEL's General Director, with the support of General Directors of the CIDESI and the CIATEQ has expressed their high commitment to the project supported by the GEF and the project's value for the country in the development of human capital, as well as in the creation of value chains for the local manufacturing of wind turbine components.

To strengthen stakeholder engagement, on July 9th, 2021, Mexico's high level IDB representatives along with the INEEL's and CIATEQ's General Directors, a visit was carried out to the CIATEQ facilities, where the wind turbine blades are being manufactured. The meeting resulted in the confirmation of high commitment to the project, and it was agreed to give priority to all activities that would allow to meet the project objectives.

KNOWLEDGE

Please add information on knowledge activities and products developed in relation to the project (with GEF or non-GEF resources), with special emphasis on activities carried out during the 2020-2021 GEF Fiscal Year. As applicable, please include **information on issues and solutions related to COVID-19.**

During 2020 – 2021 no new knowledge activities were carried out due to the COVID-19 pandemic. Among the postponed/cancelled activities was a training workshop scheduled for the second semester of 2020 in Querétaro, México. The main results of assimilation of knowledge are those related to the important development of capacities and abilities within the young researchers who are participating in the project both at CIDESI and CIATEQ. These two institutions have master's and doctorate programs, so it is expected that the knowledge acquired will be disseminated to the students of these programs.

PROJECT MODIFICATIONS

Please report any significant modifications made to the project design since July 1st, 2020. (The basis for comparison is the Project Results Framework Matrix included in the original Request for CEO Endorsement Document.) This should be based on the Project Results Framework Matrix included in the original Request for CEO Endorsement Document.

CHANGE MADE TO	YES/NO	DESCRIPTION OF CHANGE AND EXPLANATION
Objective	NO	
Outcome	NO	
Output/Activities	YES	<p>The National Electricity and Clean Energy Institute (INEEL), the Executing Agency, has confirmed that without the pending local counterpart resources the 1.2MW wind turbine prototype will not be completed and installed at the Regional Wind Technology Center as originally planned.</p> <p>However, the INEEL has committed to the IDB the completion of two blades manufacturing in 2021. As part of the project, the blades will be used to perform destructive and mechanics tests that will provide valuable information on the design and manufacturing process. For blade 00, destructive tests will be done to detect infusion problems, while for blade 01, mechanics tests will provide resistance information on the structure.</p>
Other	NO	

Has the project been granted any extension or other modification covered by the OA-420 from July 1st, 2020 until June 30th, 2021? If yes, please explain below. As applicable, please include *information on issues and solutions related to COVID-19*.

Yes, the original end date was February 15th, 2017. In December 2020, with previous consent of the *Secretaría de Hacienda y Crédito Público* (GEF's focal point in the country), the IDB approved a new project extension until November 2021 to ensure the use of the remaining resources and to deliver the expected products.

LESSONS LEARNED / BEST PRACTICES

*If the project generated any lessons learned or best practices during the 2020-2021 GEF Fiscal Year, please provide a short description. As applicable, please include *information on issues and solutions related to COVID-19*.*

TOPIC/THEME	LESSONS
Knowledge and capacity building	Beyond the physical construction of the Mexican wind turbine, the project is also focused to the development of local skills, knowledge, and transfer of experiences between public and private stakeholders. CIATEQ's participation has demonstrated the advantages of involving a national center to assimilate the manufacturing capacity of blades for wind turbines. CIATEQ has become an important agent in the logistics adjustment for manufacturing as well as in the coordination of the different members of the team that participate in the process. Likewise, CIATEQ plays an important role in the fulfillment of the manufacturing plan within the estimated budget. CIATEQ will be an important disseminator of the experiences obtained by this project.
Planning and project management	In Projects like this, the participation of institutions with sufficient technical capacity and infrastructure is necessary to ensure the adequate fulfillment of the activities, use of assigned resources, as well as the established times. Executing Agencies in similar Research and Development projects need to adopt different planning and project management mechanisms. This is because projects of this nature have a different life cycle than traditional infrastructure projects usually carried out in collaboration with multilaterals. In addition, it is necessary to strengthen the execution and administration capacities of the executing agencies and intensify the supervision of the IDB. In this case, it was necessary to conduct weekly meetings to monitor the project with the participation of INEEEL, CIATEQ, and the IDB's energy, procurement, and fiduciary specialists, to identify risks and carry out preventive actions. It was also necessary to streamline all approval processes, as well as those for the implementation of different adjustments.
Research and development in developing countries/ coordination	There is a series of lessons learned from this project over the time of its execution, many of them related to the nature of a Research and Development project, which have been shared in previous reports and will also be reflected in the final evaluation of the project. The termination of the contract between INEEL and TEMACO for the blade manufacturing, as explained in previous sections, this contract achieved the design of

TOPIC/THEME	LESSONS
	<p>the blades thanks to the participation of the public centers CIDESI and CIATEQ, in consortium with the company TEMACO. However, TEMACO was unable to complete the construction of the industrial warehouse and the final blade manufacturing as established in said contract. TEMACO requested that INEEL extend the contract to complete the projects in 2020 but was unable to extend the corresponding guarantee.</p> <p>Although, through project monitoring, the IDB alerted INEEL about TEMACO's failure to meet the milestones set forth in the contract, INEEL decided to wait until the expiration of the contract, seeking to improve TEMACO's performance with the continuous monitoring by INEEL. This decision jeopardized the timely use of the project's committed resources within 2020 as planned. The lesson learned is the importance of a timely decision to correct deviations based on continuous monitoring.</p>
Coordination	<p>One additional lesson is the need to adapt a different planning mechanism by Executing Agencies and Implementing agencies in similar Research and Development projects, given that projects of this nature have a different life cycle than traditional infrastructure projects usually require. The project's final evaluation report will allow identification of further lessons learned with their respective evidence.</p>
Implementing Agency/procurement	<p>Another lesson learned is the need to strengthen the IDB's support in the selection and contracting processes of material suppliers, equipment, and services, in accordance with the processes agreed with the Government, to expedite them and avoid delays.</p>

ANNEX 1. DEFINITION OF RATINGS

Development Objective Ratings

1. **Highly Satisfactory (HS):** Project is expected to achieve or exceed **all** its major global environmental objectives, and yield substantial global environmental benefits, without major shortcomings. The project can be presented as “good practice”.
2. **Satisfactory (S):** Project is expected to achieve **most** of its major global environmental objectives, and yield satisfactory global environmental benefits, with only minor shortcomings.
3. **Marginally Satisfactory (MS):** Project is expected to achieve **most** of its major relevant objectives but with either significant shortcomings or modest overall relevance. Project is expected not to achieve **some** of its major global environmental objectives or yield some of the expected global environment benefits.
4. **Marginally Unsatisfactory (MU):** Project is expected to achieve **some** of its major global environmental objectives with major shortcomings or is expected to achieve only **some** of its major global environmental objectives.
5. **Unsatisfactory (U):** Project is expected **not** to achieve **most** of its major global environment objectives or to yield any satisfactory global environmental benefits.
6. **Highly Unsatisfactory (HU):** The project has failed to achieve, and is not expected to achieve, **any** of its major global environment objectives with no worthwhile benefits.

Implementation Progress Ratings

1. **Highly Satisfactory (HS):** Implementation of **all** components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as “good practice”.
2. **Satisfactory (S):** Implementation of **most** components is in substantial compliance with the original/formally revised plan except for only a few that are subject to remedial action.
3. **Marginally Satisfactory (MS):** Implementation of **some** components is in substantial compliance with the original/formally revised plan with **some** components requiring remedial action.
4. **Marginally Unsatisfactory (MU):** Implementation of **some** components is not in substantial compliance with the original/formally revised plan with **most** components requiring remedial action.
5. **Unsatisfactory (U):** Implementation of **most** components is not in substantial compliance with the original/formally revised plan.
6. **Highly Unsatisfactory (HU):** Implementation of **none** of the components is in substantial compliance with the original/formally revised plan.

Risk ratings

Risk ratings will assess the overall risk of factors internal or external to the project which may affect implementation or prospects for achieving project objectives. Risks of projects should be rated on the following scale:

1. **High Risk (H):** There is a probability of greater than 75% that assumptions may fail to hold or materialize, and/or the project may face high risks.
2. **Substantial Risk (S):** There is a probability of between 51% and 75% that assumptions may fail to hold and/or the project may face substantial risks.
3. **Modest Risk (M):** There is a probability of between 26% and 50% that assumptions may fail to hold or materialize, and/ or the project may face only modest risks.
4. **Low Risk (L):** There is a probability of up to 25% that assumptions may fail to hold or materialize, and/ or the project may face only modest risks.