Ex-Ante Evaluation (for Japanese ODA Loan)

Private Sector Investment Finance Division,
Private Sector Partnership and Finance Department,
JICA

1. Name of the Project

Country: United Mexican States
Project: Photovoltaic Power Generation Project in Mexico
Loan Agreement: March 26, 2020
Borrower: Infraestructura Energética Nova, S.A.B.de C.V. (IEnova)

2. Background and Necessity of the Project

(1) Current State and Issues of the Energy Sector in Mexico

Mexico is one of the largest emitters of CO_2 in Latin America. At the 2015 United Nations Climate Change Conference (COP 21), the Mexican government set a target of reducing CO_2 emissions by 22% by 2030 compared to projected business-as-usual levels. Of Mexico's CO_2 emissions, the power generation sector accounts for 44%. This is attributable to the fact that there is a disproportionate emphasis on thermal power generation as a source of electrical power in Mexico, with gas and oil-fired power generation accountable for 50% and 18% of domestic power generation, respectively. Two of the challenges for Mexico in fulfilling its commitment under COP21 are breaking away from a reliance on oil- and gas-fired power generation, and promoting renewable energy. The Mexican government also established the national electric system development program (PRODESEN) (2018–2032), which aims to: (i) strengthen and diversify power infrastructure, and (ii) reduce CO2 emissions by developing renewable energy infrastructure. Although there is currently no gap between power supply and demand in Mexico, and given the future increase in domestic demand, the PRODESEN foresees to reach Mexico's domestic power generation capacity to 130 GW by 2032 (an increase of 72% compared to 2017). While power generation capacity is 76 GW in 2017, and taking into account that the equivalent of 16 GW of existing power plants will cease operating by 2032 due to aging, it is estimated that 70 GW of new development will be needed. This 70 GW is expected to comprise 26.6 GW (38%) of photovoltaic and wind power generation, 24.5 GW (35%) of gas-fired power generation, 4.9 GW (7%) of nuclear power generation, and 14.7 GW (21%) of other sources. As observed, the PRODESEN highly focused in renewable energy development.

Thanks to its climate and other natural conditions, Mexico is well suited to, and has a strong potential for, photovoltaic power generation and wind power generation. However, up until 2013, given the monopolistic structure of the power industry defined

by the Federal Electricity Commission (CFE), in general, buying electricity from all public and private power producers and selling it to individual consumers, no progress was made in developing power sources that used renewable energy, typically sunlight, and power prices remained high. In 2015, Mexico established the Energy Transition Law, stipulating that it would increase the share of renewable energy in the country's power output to 35% by 2024, and to 50% by 2050. In addition, triggered by energy sector reforms, gradual improvements were made to the previous electricity market from 2013, and rights for a total of 7,773 MW of projects (including 5,393 MW photovoltaic) were granted to private producers as a consequence of three long-term electricity auctions held between 2016 and 2017 (with participation by 70 companies). As a result of competitive bidding, the purchase price for electricity (combining wholesale price + unit price of clean energy certificates (CELs)) has fallen to the 2–4 cents/kWh range, putting Mexico in the running to achieve the lowest-priced renewable energy markets in the world. IEnova is one of the companies actively promoting renewable energy business, and participated in the long-term electricity auctions mentioned above. In the process of signing a long-term power purchase agreement in relation to Pima Solar plant, which is part of the scope of this Project, IEnova became Mexico's first private-sector off-taker, and has since promoted the renewable energy business as a pioneering investor in Mexico's renewable energy.

Mexico is also an oil-producing country and exports electricity, but it relies on imports of electricity from the United States. As of 2016, the country ran a trade deficit in its electricity sector, exporting 1,968 GWh (92.4 million US dollars) while importing 2,233 GWh (162.3 million US dollars). Improving energy self-sufficiency can also be considered an issue in this regard.

(2) Japan's and JICA's Policy for the Energy Sector in Brazil and the Priority of the Project

Within its Rolling Plan for the United Mexican States (April 2018), Japan has listed "support for sustainable development for realization of an inclusive nation," and has established a cooperation program of supporting Mexico in strengthening its ability to combat climate change. In light of this cooperation policy, in the JICA Country Analysis Paper for the United Mexican States (March 2017), JICA prescribes supporting Mexico in improving its ability to deal with global issues such as climate change. Furthermore, at COP21, the Japanese government announced Actions for Cool Earth (ACE) 2.0, declaring that it would provide support so that approximately 1.3 trillion yen of publicly and privately financed projects for climate change action could be implemented in developing countries in 2020. In addition, at a high-level meeting on Japan's Long-Term Strategy under the Paris Agreement (April 2, 2019), it was stated that Japan would contribute to the global goals established in the Paris Agreement, and would

show leadership in the field of climate change. It was further discussed that expanding private finance is the most important key to combatting climate change, and that corporate initiatives for the environment are imperative. The direction of policy expressed in Japan's support in developing countries is that, through utilizing Private-Sector Investment Finance, the Japanese government ought to offset risks that cannot be borne by the private sector alone, seeking mobilization of private funds and synergies in impact. The Project is consistent with these policies.

(3) Other Donors' Activity

The Project is co-financed with the International Finance Corporation (IFC), U.S. International Development Finance Corporation (DFC) and the North American Development Bank (NADB).

3. Project Description

(1) Project Objective

The objective of this Project is to increase the supply of electricity, promote renewable energy, and diversify power sources in Mexico through support for IEnova's photovoltaic power generation projects (three projects totaling 276 MW), thereby contributing to mitigate the impact of climate change.

(2) Project Site/Target Area

Baja California and Sonora States, Mexico

(3) Project Component

The Project consists of providing a loan to IEnova for funds necessary for the three photovoltaic power generation projects listed in the table below, which are being implemented by three special purpose companies established by IEnova (for IEnova to invest the loan funds into the capital for the SPCs).

(4) Schedule

1) Rumorosa Solar, June2019 (commence operations)
2) Pima Solar, March 2019 (commence operations)
3) Don Diego Solar, before end of 2020 (commence operations)

(5) Environmental and Social Consideration /Cross-Cutting Issues/ Gender Classification

1) Environmental and Social Consideration

① Category: B

② Reason for Categorization

The Project does not fall under the categories of sensitive sectors,

characteristics and areas listed in the JICA Guidelines for Environmental and Social Considerations (announced in April 2010), and any adverse impact on the environment is deemed not significant.

③ Environmental Permit: The Environmental and Social Impact Assessment (ESIA) report has been approved by the Secretariat for the Environment and Natural Resources (SEMARNAT) or the relevant authority. Each of the projects was approved as follows: Rumorosa Solar (August 2017), Pima Solar (August 2017), Don Diego Solar (September 2016).

④ Anti-Pollution Measures: During construction, measures taken for air quality, water quality, noise, waste and so on include regularly sprinkling water, installing septic tanks, and restricting work hours so as to satisfy Mexican and international environmental standards. Once operations have commenced, waste is disposed of in an appropriate manner in accordance with domestic law, by conducting thorough sanitation control on site and through contracts with waste processing companies.

⑤ Natural Environment: Since the target areas of the Project are not in or near sensitive areas, such as national parks, any adverse impact on the natural environment will be minimal.

⑥ Social Environment: The Project will be implemented on land leased from landowners in accordance with lease contracts, and will not involve compulsory land acquisition or resettlement.

⑦ Other / Monitoring: Monitoring of the Project in relation to air quality, noise, water quality, waste and so on will be conducted by IEnova based on an annual monitoring report.

2) Gender: [Not applicable] ■GI (Gender mainstreaming needs survey/analysis project)

<Reason for classification> Although the need for gender mainstreaming was confirmed, it was not enough to include specific initiatives that contribute to gender mainstreaming. On the other hand, two of eight IEnova's management team is female (25%). This satisfies the criteria (20%) for the 2X Challenge in the infrastructure and power sectors, and an application for 2X eligibility will be made.

(6) Other Important Issues

This is JICA's first project under the Green Loan Principles.

4. Targeted Outcomes

(1) Quantitative Effects

Measure annual power generation (GWh/year), maximum capacity (MW) and annual CO_2 emission reduction (t/year).

(2) Qualitative Effects

Mitigating the impact of climate change.

5. External Factors and Risk Control

None in particular.

6. Lessons Learned from Past Projects

The ex-post evaluation of the Bishkek-Manas International Airport Modernization Project (Japanese ODA loan) in the Kyrgyz Republic suggests that strengthening organizational and management aspects (human resources, technical aspects, etc.) is necessary in order for an airport business entity to operate airport facilities in a sustainable and independent manner.

IEnova is in charge of operation and maintenance in this Project. IEnova has experience in conducting gas power generation and renewable energy business operations (including photovoltaic power generation), and has extensive knowledge on power generation operations. The company has also received technical support (personnel training, etc.) from its parent company, Sempra. There are no operational concerns.

7. Evaluation Results

The Project appears to contribute to Goal 7 (affordable and clean energy) and Goal 13 (climate action) of the SDGs; therefore, support through Private-Sector Investment Finance is highly relevant.

8. Plan for Future Evaluation

(1) Indicators to be Used

As shown in Section 4 (1) above.

(2) Timing

Check figures for 2022 (two years after financial close - planned)

END