

## **TERMS OF REFERENCE**

### **Consultancy for a baseline and future scenario assessment of the power generation and distribution grid infrastructure of Guanaja**

HONDURAS

HO-T1406

ATN/XXXX

<https://www.iadb.org/es/project/HO-T1406>

Smart Grid Assessment for Guanaja Island as Part of the “Guanaja Green Island” Program

#### **1. Background and justification**

- 1.1 The department of Islas de la Bahía is the most important tourist destination in Honduras. It has a high ethnic diversity as well as important coastal-marine ecosystems that make up the Mesoamerican barrier reef. Islas de la Bahía is formed by the three main islands, Roatán, Utila and Guanaja, as well as islets and cays surrounded by the Caribbean Sea. The socioeconomic conditions of the three main islands are quite different. Roatán is the most prosperous, while Guanaja has the greatest socioeconomic difficulties, which have been intensified by its limited infrastructure and the impact of natural phenomena such as Hurricanes Mitch<sup>1</sup>, ETA and IOTA, and a recent fire that caused damages to 40% of the urban area of the Bonaca cay in the island<sup>2</sup>. Despite having a high tourism potential, an evaluation of sustainable tourism (IDB, 2016)<sup>3</sup> reported that the main structural barrier to the development of Guanaja is the high cost of electricity, which has repercussions on the management of the basic services of the island’s infrastructure such as drinking water supply and wastewater treatment.
- 1.2 Given that Islas de la Bahía is not connected to the mainland’s grid, electricity is generated through private thermal generation plants which use imported fossil fuels. In Guanaja, the electricity service is provided by a private company which has an installed generation capacity of around 2.5 MW in diesel generators. The company provides the service to about 1,600 users, most of whom live on Bonacca Cay (simply called “El Cayo” by locals), the largest and most populous in the island. Logistics and transportation costs increase the final price of diesel, thus increasing the operation and maintenance (O&M) costs of the power plants, which translates into a higher cost of electricity. Currently, the electricity price in Guanaja is higher than 17 HNL/kWh<sup>4</sup> (Honduran lempira/kilowatt-hour); while the service provided by ENEE in the mainland has a price of 5.74 HNL/kWh on average. Moreover, the local utility has faced numerous problems due to electricity thefts and a poorly reliable grid.
- 1.3 The government of Honduras (GoH) requested support to the IDB to prepare a plan to reduce gradually the consumption of fossil fuels and to eradicate its use in the long-term, as a strategy to reduce the cost of electricity, increase competitiveness, and protect the

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<sup>1</sup> When Hurricane Mitch hit Honduras, it affected a substantial portion of Guanaja Island affecting the touristic infrastructure and fishing businesses.

<sup>2</sup> The main cay in Guanaja is Bonacca which clusters people under limited socio-economic conditions. Bonacca Cay experienced a [severe fire on October 2, 2021](#) which caused 220 families to lose their homes and damaged the drinking water system of the cay.

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<sup>4</sup> BELCO, June 2022. In addition, there is a charge for fuel price adjustment.

sensitive ecosystem. As a result of this effort, the IDB executed between 2015 and 2018, the TC “Renewable Energy Resource Evaluation in the Bay Islands (ERIBA)” (ATN/NV-14824-HO). Through the ERIBA project it was possible to: (i) conduct renewable resource assessments in the main islands, specifically for wind and solar resources; (ii) carry out pre-feasibility studies; (iii) create environmental awareness; (iv) strengthen the institutional framework; and (v) encourage local engagement of key stakeholders to support the development of renewable energy projects of the islands. The results of the ERIBA project helped Independent Power Producers (IPPs) from Roatán and Utila to start renewable energy power generation projects to reduce fossil fuel consumption. Nevertheless, in Guanaja there was no interest considering that the utility operator has no financial strength, and its contract will expire soon.

- 1.4 In 2016, the GoH received the support of the Korea's Knowledge Sharing Program (KSP) “Renewable Energy and Energy Storage Deployment on Islas de la Bahia”. This project conducted the prefeasibility studies for the Guanaja Green Island Project and provided capacity building sharing experiences of South Korea in microgrids development. To increase its participation, the KSP proposed to develop the renewable energy projects in Guanaja in three phases as follows: (i) a first phase up to 20% of renewable energy penetration of power generation; (ii) a second phase up to 80%; and (iii) a third phase of 100% of renewable energy including smart grid technology. In the three phases a capacity building program would be executed in parallel to the renewable energy development.
- 1.5 While the KSP project was running, the Climate Investment Fund (CIF), through the Scaling up Renewable Energy in Low Income Countries Program (SREP), allocated resources for the “Remote Area Rural Electrification Program” (GRT/SX-17123-HO), the so-called PERLA Program, administrated by IDB. The executing agency of this program is the National Electric Energy Company (ENEE) through the Social Fund for Electricity Development (FOSODE). The program includes building microgrids in Guanaja and Brus Laguna, a community located in the Honduran Mosquitia, as well as individual solar photovoltaic systems in the department of Choluteca. The Program will also strengthen the capacities of GoH officials for expanding the electricity access nationwide, as part of the national “Universal Electricity Access in Honduras Program.” The microgrids developed by this program will be the first experience for Honduras with this type of systems and will contribute to reaching universal access in the country. Under PERLA, Guanaja microgrid will integrate solar photovoltaic energy (600 kWp) with energy storage (540 kWh) and thermal power generation as back up aiming to reduce up to 15% the diesel consumption in its first phase, contributing to the KSP plans mentioned before. Currently, the microgrid project is under construction phase and according to the contract, it will begin operations in November 2022.
- 1.6 In 2019, FOSODE, with the support of IDB, prepared the proposal “Guanaja Green Island: Renewable Energy Microgrid and Energy Storage in Guanaja” for the Korea Institute for Advancement of Technology (KIAT). This project aims to increase the renewable energy penetration up to 75%, which will increase the photovoltaic capacity (3 MWp) and energy storage (9 MWh). The program will also include a capacity building program for the design, construction, operation, and maintenance of microgrids. The project was approved by KIAT program, and it is also under execution.
- 1.7 The IDB is supporting the GoH with a technical cooperation (TC) whose main objective is to support the GoH in planning the Guanaja Green Island Program to evaluate the applicability of smart grid technologies and make suggestions on regulatory and legal

considerations that can be implemented at a national level to foster to foster energy access through renewable energy and the use of smart grids.

- 1.8 Therefore, in the context of the aforementioned TC, the IDB will hire a consulting firm to support the GoH in evaluating the existing generation and distribution grid infrastructure as a prior phase to prepare a smart grid investment plan for smart grids.

## **2. Objectives**

- 2.1 The general objective of this consultancy is to support the GoH in planning the Guanaja Green Island Program in order to: (i) evaluate the existing distribution grid infrastructure; and (ii) conduct energy demand-side management assessments, including the evaluation of terrestrial and maritime electric mobility options.

## **3. Scope of Services**

- 3.1 The consulting firm should, at a minimum, provide the following services:
  - (i) Assessment of power infrastructure including power generation and distribution infrastructure.
  - (ii) Assessment of the potential of demand-side management options in Guanaja.

## **4. Key Activities**

- 4.1 The consulting firm must carry out all the necessary activities to achieve the objectives, including, among others, the following:
- 4.2 **Activity 1. Baseline and future scenario assessment of the power infrastructure.** The consulting firm consists of a power infrastructure evaluation, including power generation and distribution infrastructure. This study will assess the power generation expansion plans to be developed with the support of international financial organizations (§1.4; phase 1 and phase 2) and local stakeholders such as ENEE and consumers (distributed generation and green building). It will also assess the distribution infrastructure expansion plan. The assessment will also evaluate operation safety measures to protect existing power infrastructure.
- 4.3 **Activity 2. Techno-economic assessment of the potential of demand-side management on the island.** This assessment will consider different energy efficiency programs for various energy uses including, electricity utilization, heating and cooling applications, water pumping, transportation and electromobility options (land and maritime solutions), and their influence on power generation.

## **5. Expected Outcomes and Deliverables**

- 5.1 **Work Plan.** The work plan must be delivered and presented at a meeting (face-to-face or by videoconference) within two weeks of signing the contract and must include a detailed work plan schedule and cost allocation for each activity, including the list of staff involved.
- 5.2 **Preliminary report.** This will include the results corresponding to Activity 1 and Activity 2, and must be delivered within the 2 months following the signing of the contract.

- 5.3 **Final report.** This will include the results corresponding to Activity 1 (including the comments and observations provided by the Bank) and Activity 2, and must be delivered within the 4 months following the signing of the contract.

## **6 Reporting Requirements**

- 6.1. The reports, spreadsheets and any other means used to present the results of the consultancy must be presented in Spanish. Reports should include both editorial-quality written reports and graphic design suitable for publication. Powerpoints presenting the reports succinctly and communicatively must also be submitted.

## **7 Supervision and Reporting**

- 7.1 The consulting firm will report directly to the sector senior specialist based in Tegucigalpa, Honduras, Mr. Carlos Jácome, [carlosja@iadb.org](mailto:carlosja@iadb.org).

## **8 Schedule of Payments**

- 8.1 Payment terms will be based on project milestones or deliverables. The Bank expects to receive the most competitive cost proposal for the services described herein. The consultant must consider the maximum budget of US\$150,000 to achieve the objectives of the consultancy.

<b>Payment Schedule</b>	
<b>Deliverable</b>	<b>%</b>
1. Delivery and approval of the work plan	20%
2. Delivery and approval of Preliminary Report	40%
3. Delivery and approval of Final Report	40%
<b>TOTAL</b>	<b>100%</b>

## **TERMS OF REFERENCE**

### **Consultancy for an Information and Communication Technology (ICT) assessment that will propose the requirements for the next generation grid in Guanaja**

HONDURAS

HO-T1406

ATN/XXXX

<https://www.iadb.org/es/project/HO-T1406>

Smart Grid Assessment for Guanaja Island as Part of the “Guanaja Green Island” Program

#### **1. Background and justification**

- 1.1. The department of Islas de la Bahía is the most important tourist destination in Honduras. It has a high ethnic diversity as well as important coastal-marine ecosystems that make up the Mesoamerican barrier reef. Islas de la Bahía is formed by the three main islands, Roatán, Utila and Guanaja, as well as islets and cays surrounded by the Caribbean Sea. The socioeconomic conditions of the three main islands are quite different. Roatán is the most prosperous, while Guanaja has the greatest socioeconomic difficulties, which have been intensified by its limited infrastructure and the impact of natural phenomena such as Hurricanes Mitch<sup>1</sup>, ETA and IOTA, and a recent fire that caused damages to 40% of the urban area of the Bonaca cay in the island<sup>2</sup>. Despite having a high tourism potential, an evaluation of sustainable tourism (IDB, 2016)<sup>3</sup> reported that the main structural barrier to the development of Guanaja is the high cost of electricity, which has repercussions on the management of the basic services of the island’s infrastructure such as drinking water supply and wastewater treatment.
- 1.2. Given that Islas de la Bahía is not connected to the mainland’s grid, electricity is generated through private thermal generation plants which use imported fossil fuels. In Guanaja, the electricity service is provided by a private company which has an installed generation capacity of around 2.5 MW in diesel generators. The company provides the service to about 1,600 users, most of whom live on Bonacca Cay (simply called “El Cayo” by locals), the largest and most populous in the island. Logistics and transportation costs increase the final price of diesel, thus increasing the operation and maintenance (O&M) costs of the power plants, which translates into a higher cost of electricity. Currently, the electricity price in Guanaja is higher than 17 HNL/kWh<sup>4</sup> (Honduran lempira/kilowatt-hour); while the service provided by ENEE in the mainland has a price of 5.74 HNL/kWh on average. Moreover, the local utility has faced numerous problems due to electricity thefts and a poorly reliable grid.
- 1.3. The government of Honduras (GoH) requested support to the IDB to prepare a plan to reduce gradually the consumption of fossil fuels and to eradicate its use in the long-term,

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<sup>2</sup> The main cay in Guanaja is Bonacca which clusters people under limited socio-economic conditions. Bonacca Cay experienced a [severe fire on October 2, 2021](#) which caused 220 families to lose their homes and damaged the drinking water system of the cay.

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<sup>4</sup> BELCO, June 2022. In addition, there is a charge for fuel price adjustment.

as a strategy to reduce the cost of electricity, increase competitiveness, and protect the sensitive ecosystem. As a result of this effort, the IDB executed between 2015 and 2018, the TC “Renewable Energy Resource Evaluation in the Bay Islands (ERIBA)” (ATN/NV-14824-HO). Through the ERIBA project it was possible to: (i) conduct renewable resource assessments in the main islands, specifically for wind and solar resources; (ii) carry out pre-feasibility studies; (iii) create environmental awareness; (iv) strengthen the institutional framework; and (v) encourage local engagement of key stakeholders to support the development of renewable energy projects of the islands. The results of the ERIBA project helped Independent Power Producers (IPPs) from Roatán and Utila to start renewable energy power generation projects to reduce fossil fuel consumption. Nevertheless, in Guanaja there was no interest considering that the utility operator has no financial strength, and its contract will expire soon.

- 1.4. In 2016, the GoH received the support of the Korea’s Knowledge Sharing Program (KSP) “Renewable Energy and Energy Storage Deployment on Islas de la Bahia”. This project conducted the prefeasibility studies for the Guanaja Green Island Project and provided capacity building sharing experiences of South Korea in microgrids development. To increase its participation, the KSP proposed to develop the renewable energy projects in Guanaja in three phases as follows: (i) a first phase up to 20% of renewable energy penetration of power generation; (ii) a second phase up to 80%; and (iii) a third phase of 100% of renewable energy including smart grid technology. In the three phases a capacity building program would be executed in parallel to the renewable energy development.
- 1.5. While the KSP project was running, the Climate Investment Fund (CIF), through the Scaling up Renewable Energy in Low Income Countries Program (SREP), allocated resources for the “Remote Area Rural Electrification Program” (GRT/SX-17123-HO), the so-called PERLA Program, administrated by IDB. The executing agency of this program is the National Electric Energy Company (ENEE) through the Social Fund for Electricity Development (FOSODE). The program includes building microgrids in Guanaja and Brus Laguna, a community located in the Honduran Mosquitia, as well as individual solar photovoltaic systems in the department of Choluteca. The Program will also strengthen the capacities of GoH officials for expanding the electricity access nationwide, as part of the national “Universal Electricity Access in Honduras Program.” The microgrids developed by this program will be the first experience for Honduras with this type of systems and will contribute to reaching universal access in the country. Under PERLA, Guanaja microgrid will integrate solar photovoltaic energy (600 kWp) with energy storage (540 kWh) and thermal power generation as back up aiming to reduce up to 15% the diesel consumption in its first phase, contributing to the KSP plans mentioned before. Currently, the microgrid project is under construction phase and according to the contract, it will begin operations in November 2022.
- 1.6. In 2019, FOSODE, with the support of IDB, prepared the proposal “Guanaja Green Island: Renewable Energy Microgrid and Energy Storage in Guanaja” for the Korea Institute for Advancement of Technology (KIAT). This project aims to increase the renewable energy penetration up to 75%, which will increase the photovoltaic capacity (3 MWp) and energy storage (9 MWh). The program will also include a capacity building program for the design, construction, operation, and maintenance of microgrids. The project was approved by KIAT program, and it is also under execution.
- 1.7. The IDB is supporting the GoH with a technical cooperation (TC) whose main objective is to support the GoH in planning the Guanaja Green Island Program to evaluate the



applicability of smart grid technologies and make suggestions on regulatory and legal considerations that can be implemented at a national level to foster energy access through renewable energy and the use of smart grids.

- 1.8. Therefore, in the context of the aforementioned TC, the IDB will hire a consulting firm to support the GoH in performing an Information and Communication Technology (ICT) assessment to propose the requirements for the next generation grid for Guanaja as a prior phase to prepare a smart grid investment plan for smart grids. This consultancy will use as an input the results of a previous one where the generation and distribution grid will be assessed and a baseline and future scenario will be built, including a techno-economic assessment of the potential of demand-side management.

## **2. Objectives**

- 2.1. The general objective of this consultancy is to support the GoH in planning the Guanaja Green Island Program in order to propose the requirements for the next generation grid that will transport electricity and collect information from suppliers and consumers in real time.

## **3. Scope of Services**

- 3.1. The consulting firm should, at a minimum, provide the following services:
  - (i) Assessment on Information and Communication Technology (ICT) alternatives that will propose the requirements for the next generation grid.

## **4. Key Activities**

- 4.1. The consulting firm must carry out all the necessary activities to achieve the objectives, including, among others, the following:
- 4.2. **Activity 1. Information and Communication Technology (ICT) assessment.** The consulting firm will propose the requirements for the next generation network that will transport electricity and collect information from suppliers and consumers in real time, evaluating the capacity of different generation power sources, networks, and communication infrastructure and the benefits of their integration to the grid.

## **5. Expected Outcomes and Deliverables**

- 5.1. **Work Plan.** The work plan must be delivered and presented at a meeting (face-to-face or by videoconference) within two weeks of signing the contract and must include a detailed work plan schedule and cost allocation for each activity, including the list of staff involved.
- 5.2. **Final report.** This must include all the recommendations, requirements, and results discussed with the IDB team for the previous work "Consultancy for a baseline and future scenario assessment of the power generation and distribution grid infrastructure of Guanaja". This report must also include the results corresponding to Activity 1. The final report must be delivered no later than 3 months after the signing of the contract.

## **6. Reporting Requirements**

- 8.2 The reports, spreadsheets and any other means used to present the results of the consultancy must be presented in Spanish. Reports should include both editorial-quality

written reports and graphic design suitable for publication. Powerpoints presenting the reports succinctly and communicatively must also be submitted.

## **9 Supervision and Reporting**

- 9.1 The consulting firm will report directly to the sector senior specialist based in Tegucigalpa, Honduras, Mr. Carlos Jácome, [carlosja@iadb.org](mailto:carlosja@iadb.org).

## **10 Schedule of Payments**

- 10.1 Payment terms will be based on project milestones or deliverables. The Bank expects to receive the most competitive cost proposal for the services described herein. The consultant must consider the maximum budget of US\$100,000 to achieve the objectives of the consultancy.

<b>Payment Schedule</b>	
<b>Deliverable</b>	<b>%</b>
1. Delivery and approval of the work plan	20%
2. Delivery and approval of final report	80%
<b>TOTAL</b>	<b>100%</b>



## **TERMS OF REFERENCE**

### **Consultancy for the Development of Smart Grid Development Plan for Guanaja**

HONDURAS

HO-T1406

ATN/XXXX

<https://www.iadb.org/es/project/HO-T1406>

Smart Grid Assessment for Guanaja Island as Part of the “Guanaja Green Island” Program

#### **1. Background and justification**

- 1.1. The department of Islas de la Bahía is the most important tourist destination in Honduras. It has a high ethnic diversity as well as important coastal-marine ecosystems that make up the Mesoamerican barrier reef. Islas de la Bahía is formed by the three main islands, Roatán, Utila and Guanaja, as well as islets and cays surrounded by the Caribbean Sea. The socioeconomic conditions of the three main islands are quite different. Roatán is the most prosperous, while Guanaja has the greatest socioeconomic difficulties, which have been intensified by its limited infrastructure and the impact of natural phenomena such as Hurricanes Mitch<sup>1</sup>, ETA and IOTA, and a recent fire that caused damages to 40% of the urban area of the Bonaca cay in the island<sup>2</sup>. Despite having a high tourism potential, an evaluation of sustainable tourism (IDB, 2016)<sup>3</sup> reported that the main structural barrier to the development of Guanaja is the high cost of electricity, which has repercussions on the management of the basic services of the island’s infrastructure such as drinking water supply and wastewater treatment.
- 1.2. Given that Islas de la Bahía is not connected to the mainland’s grid, electricity is generated through private thermal generation plants which use imported fossil fuels. In Guanaja, the electricity service is provided by a private company which has an installed generation capacity of around 2.5 MW in diesel generators. The company provides the service to about 1,600 users, most of whom live on Bonacca Cay (simply called “El Cayo” by locals), the largest and most populous in the island. Logistics and transportation costs increase the final price of diesel, thus increasing the operation and maintenance (O&M) costs of the power plants, which translates into a higher cost of electricity. Currently, the electricity price in Guanaja is higher than 17 HNL/kWh<sup>4</sup> (Honduran lempira/kilowatt-hour); while the service provided by ENEE in the mainland has a price of 5.74 HNL/kWh on average. Moreover, the local utility has faced numerous problems due to electricity thefts and a poorly reliable grid.
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- 1.6. In 2019, FOSODE, with the support of IDB, prepared the proposal “Guanaja Green Island: Renewable Energy Microgrid and Energy Storage in Guanaja” for the Korea Institute for Advancement of Technology (KIAT). This project aims to increase the renewable energy penetration up to 75%, which will increase the photovoltaic capacity (3 MWp) and energy storage (9 MWh). The program will also include a capacity building program for the design, construction, operation, and maintenance of microgrids. The project was approved by KIAT program, and it is also under execution.
- 1.7. The IDB is supporting the GoH with a technical cooperation (TC) whose main objective is to support the GoH in planning the Guanaja Green Island Program to evaluate the applicability of smart grid technologies and make suggestions on regulatory and legal

considerations that can be implemented at a national level to foster energy access through renewable energy and the use of smart grids.

- 1.8. Therefore, in the context of the aforementioned TC, the IDB will hire a consulting firm to support the GoH to evaluate the opportunities to apply smart grid technologies in Guanaja's grid and develop an investment plan.

## **2. Objectives**

- 2.1. The general objective of this consultancy is to support the GoH in planning the Guanaja Green Island Program in order to evaluate the applicability of smart grid technologies through an investment plan, considering previous grid and demand-side assessments as inputs, as well as the expansion and investment plans for renewable energy generation.

## **3. Scope of Services**

- 3.1. The consulting firm should, at a minimum, provide the following services:
  - (i) Development of a smart grid investment plan to implement a smart grid program in Guanaja, including investments in grid infrastructure for electricity and data.

## **4. Key Activities**

- 4.1. The consulting firm must carry out all the necessary activities to achieve the objectives, including, among others, the following:
- 4.2. **Activity 1. Smart grid investment plan.** Considering the assessments from consultancies, the consulting firm will develop a smart grids investment plan for Guanaja. This plan should include investments in grid infrastructure for electricity and data, and should consider the following alternatives: Advanced Metering Infrastructure (AMI), Energy Management Systems (EMS) for buildings, Electric Vehicles (EV) charging infrastructure, data management, and Distributed Energy Resources (DERs) management. It will also evaluate the local capacities and the investment required to conduct the future O&M work of smart grids in the island. The results of the investment plan will be used for the preparation of future IDB loan operations, and shall explore include possible synergies with IDB Invest and IDB Lab.
- 4.3. **Activity 2. Results dissemination.** The consulting firm will prepare a workshop so that that the results and recommendations of the consultancy can be shared with government authorities' responsible for making decisions.

## **5. Expected Outcomes and Deliverables**

- 5.1. **Work Plan.** The work plan must be delivered and presented at a meeting (face-to-face or by videoconference) within two weeks of signing the contract and must include a detailed work plan schedule and cost allocation for each activity, including the list of staff involved.
- 5.2. **Final report.** This must include all the recommendations, requirements, and results discussed with the IDB team in previous consultancies. This report must also include the results corresponding to Activity 1, i.e., the Smart Grid Investment Plan. The final report must be delivered no later than 5 months after the signing of the contract.

- 5.3. **Final dissemination workshop.** The results and recommendations of the consultancy will be disseminated to the government authorities responsible for making decisions. The dissemination workshop must be held within 6 months after the signing of the contract to present the results, conclusions and recommendations resulting from the consultancy.

## 6. **Reporting Requirements**

- 6.1. The reports, spreadsheets and any other means used to present the results of the consultancy must be presented in Spanish. Reports should include both editorial-quality written reports and graphic design suitable for publication. Powerpoints presenting the reports succinctly and communicatively must also be submitted.

## 7. **Supervision and Reporting**

- 7.1. The consulting firm will report directly to the sector senior specialist based in Tegucigalpa, Honduras, Mr. Carlos Jácome, [carlosja@iadb.org](mailto:carlosja@iadb.org).

## 8. **Schedule of Payments**

- 8.1. Payment terms will be based on project milestones or deliverables. The Bank expects to receive the most competitive cost proposal for the services described herein. The consultant must consider the maximum budget of US\$185,000 to achieve the objectives of the consultancy.

<b>Payment Schedule</b>	
<b>Deliverable</b>	<b>%</b>
1. Delivery and approval of the work plan	20%
2. Delivery and approval of the final report	60%
3. Final dissemination workshop	20%
<b>TOTAL</b>	<b>100%</b>

## **CONSULTANCY – DEVELOPMENT OF A ROUTE MAP FOR IMPROVING THE EXISTING LEGAL AND REGULATORY FRAMEWORK FOR SMART GRID ASSESSMENT FOR GUANAJA ISLAND (INE/ENE)**

### **Background of this search**

The department of Islas de la Bahía is the most important tourist destination in Honduras. It has a high ethnic diversity as well as important coastal-marine ecosystems that make up the Mesoamerican barrier reef. Islas de la Bahía is formed by the three main islands, Roatán, Utila and Guanaja, as well as islets and cays surrounded by the Caribbean Sea. The socioeconomic conditions of the three main islands are quite different. Roatán is the most prosperous, while Guanaja has the greatest socioeconomic difficulties, which have been intensified by its limited infrastructure and the impact of natural phenomena such as Hurricanes Mitch<sup>1</sup>, ETA and IOTA, and a recent fire that caused damages to 40% of the urban area of the Bonaca cay in the island<sup>2</sup>. Despite having a high tourism potential, an evaluation of sustainable tourism (IDB, 2016)<sup>3</sup> reported that the main structural barrier to the development of Guanaja is the high cost of electricity, which has repercussions on the management of the basic services of the island's infrastructure such as drinking water supply and wastewater treatment.

Given that Islas de la Bahía is not connected to the mainland's grid, electricity is generated through private thermal generation plants which use imported fossil fuels. In Guanaja, the electricity service is provided by a private company which has an installed generation capacity of around 2.5 MW in diesel generators. The company provides the service to about 1,600 users, most of whom live on Bonacca Cay (simply called "El Cayo" by locals), the largest and most populous in the island. Logistics and transportation costs increase the final price of diesel, thus increasing the operation and maintenance (O&M) costs of the power plants, which translates into a higher cost of electricity. Currently, the electricity price in Guanaja is higher than 17 HNL/kWh<sup>4</sup> (Honduran lempira/kilowatt-hour); while the service provided by ENEE in the mainland has a price of 5.74 HNL/kWh on average. Moreover, the local utility has faced numerous problems due to electricity thefts and a poorly reliable grid.

The government of Honduras (GoH) requested support to the IDB to prepare a plan to reduce gradually the consumption of fossil fuels and to eradicate its use in the long-term, as a strategy to reduce the cost of electricity, increase competitiveness, and protect the sensitive ecosystem. As a result of this effort, the IDB executed between 2015 and 2018, the TC "Renewable Energy Resource Evaluation in the Bay Islands (ERIBA)" (ATN/NV-14824-HO). Through the ERIBA project it was possible to: (i) conduct renewable resource assessments in the main islands, specifically for wind and solar resources; (ii) carry out pre-feasibility studies; (iii) create environmental awareness; (iv) strengthen the institutional framework; and (v) encourage local

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engagement of key stakeholders to support the development of renewable energy projects of the islands. The results of the ERIBA project helped Independent Power Producers (IPPs) from Roatán and Utila to start renewable energy power generation projects to reduce fossil fuel consumption. Nevertheless, in Guanaja there was no interest considering that the utility operator has no financial strength, and its contract will expire soon.

In 2016, the GoH received the support of the Korea's Knowledge Sharing Program (KSP) "Renewable Energy and Energy Storage Deployment on Islas de la Bahia". This project conducted the prefeasibility studies for the Guanaja Green Island Project and provided capacity building sharing experiences of South Korea in microgrids development. To increase its participation, the KSP proposed to develop the renewable energy projects in Guanaja in three phases as follows: (i) a first phase up to 20% of renewable energy penetration of power generation; (ii) a second phase up to 80%; and (iii) a third phase of 100% of renewable energy including smart grid technology. In the three phases a capacity building program would be executed in parallel to the renewable energy development.

While the KSP project was running, the Climate Investment Fund (CIF), through the Scaling up Renewable Energy in Low Income Countries Program (SREP), allocated resources for the "Remote Area Rural Electrification Program" (GRT/SX-17123-HO), the so-called PERLA Program, administrated by IDB. The executing agency of this program is the National Electric Energy Company (ENEE) through the Social Fund for Electricity Development (FOSODE). The program includes building microgrids in Guanaja and Brus Laguna, a community located in the Honduran Mosquitia, as well as individual solar photovoltaic systems in the department of Choluteca. The Program will also strengthen the capacities of GoH officials for expanding the electricity access nationwide, as part of the national "Universal Electricity Access in Honduras Program." The microgrids developed by this program will be the first experience for Honduras with this type of systems and will contribute to reaching universal access in the country. Under PERLA, Guanaja microgrid will integrate solar photovoltaic energy (600 kWp) with energy storage (540 kWh) and thermal power generation as back up aiming to reduce up to 15% the diesel consumption in its first phase, contributing to the KSP plans mentioned before. Currently, the microgrid project is under construction phase and according to the contract, it will begin operations in November 2022.

In 2019, FOSODE, with the support of IDB, prepared the proposal "Guanaja Green Island: Renewable Energy Microgrid and Energy Storage in Guanaja" for the Korea Institute for Advancement of Technology (KIAT). This project aims to increase the renewable energy penetration up to 75%, which will increase the photovoltaic capacity (3 MWp) and energy storage (9 MWh). The program will also include a capacity building program for the design, construction, operation, and maintenance of microgrids. The project was approved by KIAT program, and it is also under execution.

The IDB is supporting the GoH with a technical cooperation (TC) whose main objective is to support the GoH in planning the Guanaja Green Island Program to evaluate the applicability of smart grid technologies and make suggestions on regulatory and legal considerations that can be implemented at a national level to foster to foster energy access through renewable energy and the use of smart grids. The IDB has hired a consulting firm to support the GoH in evaluating the existing distribution grid infrastructure and conduct demand-side management assessments that will be used as an input to evaluate the opportunities to apply smart grid technologies in Guanaja's grid and will present them in an investment plan.



In the context of the aforementioned TC, the IDB will hire an individual consultant to support the program execution and prepare technical information to systematize lessons learned, share experience and knowledge with South Korea, and communicate technological improvements. Furthermore, as part of the consultancy and the national strategy for energy transition, the consultant will provide a route map for improving the existing legal and regulatory framework to foster energy access through the development of smart grid technologies.

### **The team's mission**

Established in 1959, the IDB is the main source of financing for economic, social, and institutional development in Latin America and the Caribbean (LAC). It provides loans, grants, guarantees, policy advice and technical assistance to the public and private sectors in LAC countries.

The general objective of this consulting is to support the GoH to improve the existing legal and regulatory framework to foster energy access through the development of smart grid technologies.

### **What you'll do**

#### **Scope of Services**

The consultant should, at a minimum, provide the following services:

- (i) Development of a route map for improving the existing legal and regulatory framework to foster the development of smart grid technologies. This will include a review of the current legal framework and make recommendations of modifications, if applicable, and design and draft regulatory elements for the inclusion of smart grids in the current national regulation. This should include a clear definition of smart grids to allow the GoH to have a common understanding of it, and to provide clarity to the sector.

#### **Key Activities**

The consultancy should perform all the activities required to achieve the objectives previously described, including but not restricted to:

#### **Deliverables**

- (i) A brief that include the possible modifications to the current legal framework regarding smart grids in the country, as well as, a regulation draft to promote and incentivize the the development of smart grids in the country.
- (ii) A workshop for the presentation of the proposed draft regulation.

#### **Project Schedule and Milestones**



Project Schedule	
Deliverable	Deadline
1. Work plan	2 weeks after signing the contract
2. Route map for improving the existing legal and regulatory framework to foster the development of smart grid technologies	4 months after signing the contract
3. Final dissemination workshop	5 months after signing contract

The following procedure will be used to approve project deliverables:

1. All work will be managed in the cloud for easy access. Products can also be sent by email.
2. The products will be presented in Spanish.
3. The IDB will present a written approval (email) after receiving each deliverable with the specifications established in this item.

### Payment Schedule

The payments will be specified in the contract, using the concept of global sum (lump sum), and will be carried out in the function of the deliverables once received and approved by the satisfaction of the IDB in the following way:

Payment Schedule	
Deliverable	%
Deliverable 1	15%
Deliverable 2	70%
Deliverable 3	15%
<b>TOTAL</b>	<b>100%</b>

### What you'll need

- **Citizenship:** You are a citizen of one of our 48 member countries.
- **Consanguinity:** You have no family members (up to the fourth degree of consanguinity and second degree of affinity, including spouse) working at the IDB Group.
  - a. **Education:** Master's degree in energy/electrical engineering, renewable energy, smart grids, or equivalent.
  - b. **Experience:** 10+ years of relevant professional experience.
  - c. **Languages:** Spanish with the ability to read and write in English.

### Core and Technical Competencies

Knowledge of the Honduran energy sector and its laws and regulations.

### Opportunity Summary

- **Type of contract and modality:** Products and External Services - PEC - Lump sum.
- **Length of contract:** 5 months

HRD Terms of Reference,  
For PEC consultancies

- **Starting date:** July 2024
- **Location:** Consultant Location
- **Responsible person:** The Consultant will report on all aspects related to this assignment to Carlos Jácome, senior sector specialist in the country.
- **Requirements:** You must be a citizen of one of the IDB's 48 member countries and have no family members currently working at the IDB Group.

**Our culture:** Our people are committed and passionate about improving lives in Latin-America and the Caribbean, and they get to do what they love in a diverse, collaborative and stimulating work environment. We are the first Latin American and Caribbean development institution to be awarded the EDGE certification, recognizing our strong commitment to gender equality. As an employee, you can be part of internal resource groups that connect our diverse community around common interests.

Because we are committed to providing equal opportunities in employment, we embrace all diversity and encourage women, LGBTQ+, persons with disabilities, afro-descendants, and indigenous people to apply.

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**Our team in Human Resources carefully reviews all applications.**

## **CONSULTANCY – TECHNICAL SUPPORT AND FOR THE PREPARATION OF LESSONS LEARNED AND EXPERIENCE SHARING OF THE SMART GRID ASSESSMENT FOR GUANAJA ISLAND (INE/ENE)**

### **Background of this search**

The department of Islas de la Bahía is the most important tourist destination in Honduras. It has a high ethnic diversity as well as important coastal-marine ecosystems that make up the Mesoamerican barrier reef. Islas de la Bahía is formed by the three main islands, Roatán, Utila and Guanaja, as well as islets and cays surrounded by the Caribbean Sea. The socioeconomic conditions of the three main islands are quite different. Roatán is the most prosperous, while Guanaja has the greatest socioeconomic difficulties, which have been intensified by its limited infrastructure and the impact of natural phenomena such as Hurricanes Mitch<sup>1</sup>, ETA and IOTA, and a recent fire that caused damages to 40% of the urban area of the Bonaca cay in the island<sup>2</sup>. Despite having a high tourism potential, an evaluation of sustainable tourism (IDB, 2016)<sup>3</sup> reported that the main structural barrier to the development of Guanaja is the high cost of electricity, which has repercussions on the management of the basic services of the island's infrastructure such as drinking water supply and wastewater treatment.

Given that Islas de la Bahía is not connected to the mainland's grid, electricity is generated through private thermal generation plants which use imported fossil fuels. In Guanaja, the electricity service is provided by a private company which has an installed generation capacity of around 2.5 MW in diesel generators. The company provides the service to about 1,600 users, most of whom live on Bonacca Cay (simply called "El Cayo" by locals), the largest and most populous in the island. Logistics and transportation costs increase the final price of diesel, thus increasing the operation and maintenance (O&M) costs of the power plants, which translates into a higher cost of electricity. Currently, the electricity price in Guanaja is higher than 17 HNL/kWh<sup>4</sup> (Honduran lempira/kilowatt-hour); while the service provided by ENEC in the mainland has a price of 5.74 HNL/kWh on average. Moreover, the local utility has faced numerous problems due to electricity thefts and a poorly reliable grid.

The government of Honduras (GoH) requested support to the IDB to prepare a plan to reduce gradually the consumption of fossil fuels and to eradicate its use in the long-term, as a strategy to reduce the cost of electricity, increase competitiveness, and protect the sensitive ecosystem. As a result of this effort, the IDB executed between 2015 and 2018, the TC "Renewable Energy Resource Evaluation in the Bay Islands (ERIBA)" (ATN/NV-14824-HO). Through the ERIBA project it was possible to: (i) conduct renewable resource assessments in the main islands, specifically for wind and solar resources; (ii) carry out pre-feasibility studies; (iii) create environmental awareness; (iv) strengthen the institutional framework; and (v) encourage local

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engagement of key stakeholders to support the development of renewable energy projects of the islands. The results of the ERIBA project helped Independent Power Producers (IPPs) from Roatán and Utila to start renewable energy power generation projects to reduce fossil fuel consumption. Nevertheless, in Guanaja there was no interest considering that the utility operator has no financial strength, and its contract will expire soon.

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While the KSP project was running, the Climate Investment Fund (CIF), through the Scaling up Renewable Energy in Low Income Countries Program (SREP), allocated resources for the "Remote Area Rural Electrification Program" (GRT/SX-17123-HO), the so-called PERLA Program, administrated by IDB. The executing agency of this program is the National Electric Energy Company (ENEE) through the Social Fund for Electricity Development (FOSODE). The program includes building microgrids in Guanaja and Brus Laguna, a community located in the Honduran Mosquitia, as well as individual solar photovoltaic systems in the department of Choluteca. The Program will also strengthen the capacities of GoH officials for expanding the electricity access nationwide, as part of the national "Universal Electricity Access in Honduras Program." The microgrids developed by this program will be the first experience for Honduras with this type of systems and will contribute to reaching universal access in the country. Under PERLA, Guanaja microgrid will integrate solar photovoltaic energy (600 kWp) with energy storage (540 kWh) and thermal power generation as back up aiming to reduce up to 15% the diesel consumption in its first phase, contributing to the KSP plans mentioned before. Currently, the microgrid project is under construction phase and according to the contract, it will begin operations in November 2022.

In 2019, FOSODE, with the support of IDB, prepared the proposal "Guanaja Green Island: Renewable Energy Microgrid and Energy Storage in Guanaja" for the Korea Institute for Advancement of Technology (KIAT). This project aims to increase the renewable energy penetration up to 75%, which will increase the photovoltaic capacity (3 MWp) and energy storage (9 MWh). The program will also include a capacity building program for the design, construction, operation, and maintenance of microgrids. The project was approved by KIAT program, and it is also under execution.

The IDB is supporting the GoH with a technical cooperation (TC) whose main objective is to support the GoH in planning the Guanaja Green Island Program to evaluate the applicability of smart grid technologies and make suggestions on regulatory and legal considerations that can be implemented at a national level to foster to foster energy access through renewable energy and the use of smart grids. The IDB has hired a consulting firm to support the GoH in evaluating the existing distribution grid infrastructure and conduct demand-side management assessments that will be used as an input to evaluate the opportunities to apply smart grid technologies in Guanaja's grid and will present them in an investment plan.

## HRD Terms of Reference, For PEC consultancies

In the context of the aforementioned TC, the IDB will hire an individual consultant to support the program execution and prepare technical information to systematize lessons learned, share experience and knowledge with South Korea, and communicate technological improvements. Furthermore, as part of the consultancy and the national strategy for energy transition, the consultant will provide a route map for improving the existing legal and regulatory framework to foster energy access through the development of smart grid technologies.

### **The team's mission**

Established in 1959, the IDB is the main source of financing for economic, social, and institutional development in Latin America and the Caribbean (LAC). It provides loans, grants, guarantees, policy advice and technical assistance to the public and private sectors in LAC countries.

The general objective of this consulting is to support the GoH in local coordination and technical support to share lessons learned of the TC “Smart Grid Assessment for Guanaja Island as Part of the “Guanaja Green Island” Program” (HO-T1406), as well as, to improve the existing legal and regulatory framework to foster energy access through the development of smart grid technologies.

### **What you'll do**

#### **Scope of Services**

The consultant should, at a minimum, provide the following services:

- (ii) Prepare technical information to systematize lessons learned, share experience and knowledge with the donor, and communicate technological improvements.

#### **Key Activities**

The consultancy should perform all the activities required to achieve the objectives previously described, including but not restricted to:

#### **Deliverables**

- (i) A report containing a collection of the lessons learned of the project.
- (ii) A workshop for knowledge and experience dissemination, including the technological improvements that can be achieved through the deployment of the smart grids investment plan.

#### **Project Schedule and Milestones**

<b>Project Schedule</b>	
<b>Deliverable</b>	<b>Deadline</b>
1. Work plan	2 weeks after signing the contract
2. Report with lessons learned from the technical cooperation.	3 months after signing the contract
3. Final dissemination workshop	4 months after signing contract

The following procedure will be used to approve project deliverables:

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## Payment Schedule

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## What you'll need

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- a. **Education:** Master's degree in energy/electrical engineering, renewable energy, smart grids, or equivalent.
- b. **Experience:** 10+ years of relevant professional experience.
- c. **Languages:** Spanish with the ability to read and write in English.

## Core and Technical Competencies

Knowledge of the Honduran energy sector and its laws and regulations.

## Opportunity Summary

- **Type of contract and modality:** Products and External Services - PEC - Lump sum.
- **Length of contract:** 12 months
- **Starting date:** July 2024
- **Location:** Consultant Location
- **Responsible person:** The Consultant will report on all aspects related to this assignment to Carlos Jácome, senior sector specialist in the country.
- **Requirements:** You must be a citizen of one of the IDB's 48 member countries and have no family members currently working at the IDB Group.

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HRD Terms of Reference,  
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and the Caribbean, and they get to do what they love in a diverse, collaborative and stimulating work environment. We are the first Latin American and Caribbean development institution to be awarded the EDGE certification, recognizing our strong commitment to gender equality. As an employee, you can be part of internal resource groups that connect our diverse community around common interests.

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## CONSULTANCY – LOCAL COORDINATION IN GUANAJA ISLAND TO SUPPORT THE PROGRAM EXECUTION

### Background of this search

The department of Islas de la Bahía is the most important tourist destination in Honduras. It has a high ethnic diversity as well as important coastal-marine ecosystems that make up the Mesoamerican barrier reef. Islas de la Bahía is formed by the three main islands, Roatán, Utila and Guanaja, as well as islets and cays surrounded by the Caribbean Sea. The socioeconomic conditions of the three main islands are quite different. Roatán is the most prosperous, while Guanaja has the greatest socioeconomic difficulties, which have been intensified by its limited infrastructure and the impact of natural phenomena such as Hurricanes Mitch<sup>1</sup>, ETA and IOTA, and a recent fire that caused damages to 40% of the urban area of the Bonacca cay in the island<sup>2</sup>. Despite having a high tourism potential, an evaluation of sustainable tourism (IDB, 2016)<sup>3</sup> reported that the main structural barrier to the development of Guanaja is the high cost of electricity, which has repercussions on the management of the basic services of the island's infrastructure such as drinking water supply and wastewater treatment.

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The IDB is supporting the GoH with a technical cooperation (TC) whose main objective is to support the GoH in planning the Guanaja Green Island Program to evaluate the applicability of smart grid technologies and make suggestions on regulatory and legal considerations that can be implemented at a national level to foster energy access through renewable energy and the use of smart grids.

Therefore, in the context of the aforementioned TC, the IDB will hire a consulting firm to support the GoH in evaluating the existing distribution grid infrastructure and conduct demand-side management assessments that will be used as an input to evaluate the opportunities to apply smart grid technologies in Guanaja's grid.

## **Objectives**

The general objective of this consultancy is to support the execution of the technical cooperation in Guanaja Island coordinating with GoH and relevant energy decision makers from the Government and the Island as well as relevant stakeholders from Guanaja Island. The consultant will provide administrative and technical support.

## **Scope of Services**

The consulting should, at a minimum, provide the following services:

- Identify key stakeholders for the execution of the technical cooperation in a stakeholder matrix.
- Provide support of the project management according IDB executed technical cooperation including at least.
  - o Review of the Annual Operating Plan (POA);
  - o Preparation of the Project Execution Plan (PEP);
  - o Preparation of Project activity reports
- Coordinate meetings with Consultant firms hired under the technical cooperation framework and local stakeholders to facilitate the consultant work. Provide support arranging meeting, presentations, data collection in the Island. Act as a liaison agent between IDB, Consultant Firms, Government and Municipality stakeholders.
- Support in the technical review of consultant reports.
- Provide suggestion to IDB team in case of deviation of program planning to speed up program execution.

## **Expected Outcomes and Deliverables**

**Work Plan.** The work plan must be delivered and presented at a meeting (face-to-face or by videoconference) within two weeks of signing the contract and must include a detailed work plan schedule.

**Stakeholders matrix.** It will include a detailed description of the relevant stakeholders for the technical cooperation execution including its classification according their power and interest.

**Project management tools review.** The tools will be reviewed periodically at least every semester.

**Support and review of consultant firm reports.** The consultant will provide IDB comments on consultant reports and will coordinate meeting for presenting and disseminating the most important findings to program stakeholders.

**Final report.** This must include all the recommendations, requirements, and results discussed with the IDB team and during the execution of the consultancy.

## **Reporting Requirements**

The reports, spreadsheets and any other means used to present the results of the consultancy must be presented in Spanish. Reports should include both editorial-quality written reports and

graphic design suitable for publication. Powerpoints presenting the reports succinctly and communicatively must also be submitted.

### **Supervision and Reporting**

The consulting firm will report directly to the sector senior specialist based in Tegucigalpa, Honduras, Mr. Carlos Jácome, [carlosja@iadb.org](mailto:carlosja@iadb.org).

### **Schedule of Payments**

<b>Payment Schedule</b>	
<b>Deliverable</b>	<b>%</b>
Delivery and approval of the work plan	15%
Delivery and approval of stakeholders matrix	15%
Delivery and approval of project management tools review	20%
Delivery and approval of the consultancies review report	30%
Delivery and approval of final report	20%
<b>TOTAL</b>	<b>100%</b>

### **What you'll need**

- **Citizenship:** You are a citizen of one of our 48 member countries.
- **Consanguinity:** You have no family members (up to the fourth degree of consanguinity and second degree of affinity, including spouse) working at the IDB Group.
- d. **Education:** Master's degree in energy/electrical engineering, renewable energy, smart grids, or equivalent.
- e. **Experience:** 10+ years of relevant professional experience.
- f. **Languages:** Spanish with the ability to read and write in English.

### **Core and Technical Competencies**

Professional with engineering degree. Electrical, mechanical, civil, industrial and process engineering background. MSc in renewable energy or project management. General experience working at least 10 years in the energy sector. Specific experience working in infrastructure projects in the Islands.

### **Opportunity Summary**

- **Type of contract and modality:** Products and External Services - PEC - Lump sum.
- **Length of contract:** 12 months
- **Starting date:** January 2023
- **Location:** Consultant Location
- **Responsible person:** The Consultant will report on all aspects related to this assignment to Carlos Jácome, senior sector specialist in the country.
- **Requirements:** You must be a citizen of one of the IDB's 48 member countries and have no family members currently working at the IDB Group.

**Our culture:** Our people are committed and passionate about improving lives in Latin-America and the Caribbean, and they get to do what they love in a diverse, collaborative and stimulating work environment. We are the first Latin American and Caribbean development institution to be awarded the EDGE certification, recognizing our strong commitment to gender equality. As an employee, you can be part of internal resource groups that connect our diverse community around common interests.

Because we are committed to providing equal opportunities in employment, we embrace all diversity and encourage women, LGBTQ+, persons with disabilities, afro-descendants, and indigenous people to apply.

**About us:** At the IDB, we're committed to improving lives. Since 1959, we've been a leading source of long-term financing for economic, social, and institutional development in Latin America and the Caribbean. We do more than lending though. We partner with our 48-member countries to provide Latin America and the Caribbean with cutting-edge research about relevant development issues, policy advice to inform their decisions, and technical assistance to improve on the planning and execution of projects. For this, we need people who not only have the right skills, but also are passionate about improving lives.

**Our team in Human Resources carefully reviews all applications.**