CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

CTCN Technical Assistance
Response Plan

Country:	Antigua and Barbuda
Request Identification Number:	2015-029/ATG-01

Title:	Technical Assistance for the Implementation of Projects related to the Establishment of a Sustainable Financial Mechanism for Climate Change in Antigua and Barbuda

Project summary

1. Overview of the assistance

1.1 Objectives (outcomes)

Antigua and Barbuda currently generates nearly all of its electricity from imported fossil fuels, resulting in high costs and greenhouse gas emissions.

The government of Antigua and Barbuda has determined to address these challenges through several goals and policies. The 2010 National Energy Policy contains goals to reduce energy costs, diversify from fossil fuels, and develop new technologies and sectors. The 2013 Sustainable Energy Action plan builds off of the 2010 policy by providing a comprehensive roadmap for renewable energy and energy efficiency policy development, with recommendations for the creation of certain government institutions, policies, and proposed budgets. The Action Plan also includes an internal government goal to reduce public energy consumption and expenditures by 30% by 2020.

Clean Energy Goals that targets 10% electricity from renewables by 2020, 15% by 2030, and a 25% reduction in GHG emissions below 1990 by 2020.[1]

The purpose of this quick response technical assistance project is to support Antigua and Barbuda in reaching its energy and climate goals, specifically:

- Gaining energy independence away from imported fuels
- Diversifying its energy mix away from fossil fuels
- Lowering energy costs by increasing competition in energy providers and utilizing lower cost resources including renewable energy
- Encouraging economic development with increased private sector participation in developing new energy projects

Additional benefits include reducing emissions by diversifying the energy mix to include greater amounts of solar PV and wind; improving the capacity of the Environment Division to support implementation of national energy policies and goals such as the design of future renewable energy projects and programs; and enhancing climate resiliency with the deployment of hurricane resistant energy generation and off grid technologies.

1.2 Results (outputs)

The following is a brief summary of the key outputs of this quick response project:

- In-country visit for assessment of Antigua and Barbuda's energy context, renewable energy deployment goals, and current barriers.
- Analysis of renewable energy priority technologies

[1] http://www.oas.org/en/sedi/dsd/Energy/Doc/EAP_AntiguaBarbuda_web.pdf

- Development of a scope of work for a workforce training program in inform proposals to potential donor organizations, including regional organizations.

1.3 Technology aspects

The technical assistance will surround renewable energy technologies, including on and off-grid technologies, mini grids, and storage, with special consideration for climate resilience in terms of withstanding the possibility of increased hurricanes and supporting emergency systems, such as those of hospitals and clinics.

2. Description of the Assistance

2.1 Activities

Activity 1 – In-Country Assessment
Members of the RET will conduct an in-country visit to meet with the Antigua and Barbuda NDE and key stakeholders identified in 2.3 and conduct capacity building activities. Meetings will include:

- Discussion of wind energy goals and previously conducted assessments
- Site visits to potential wind farm locations.
- Exploration of the opportunities and challenges to developing a wind market in Antigua and Barbuda, including the current transmission and system operations and planning processes
- Engaging workforce development stakeholders, such as existing relevant educational institutions and discussion of regional opportunities

Capacity building activities will be identified in further discussion with the NDE and could involve up to two days of trainings.

Deliverables	Delivery date
Summary Report of Key Outcomes	*3 weeks after visit*

Activity 2 – Analysis of Renewable Energy Priority Technologies for Deployment
In partnership with the Clean Energy Solutions Center, a network partner of the CTCN, experts will analyze Antigua and Barbuda's renewable energy technology potentials and provide recommendations for technologies to target for deployment and possible policy support. The analysts will build off of previous analyses conducted, including the GIZ wind study, the Navigant report, Renewable Energy Assessment and The Grid Stability Study (prepared with technical assistance by IRENA) . The recommendations will help inform activity 3 in terms of identifying priority technologies for which further workforce training may be of value. Given the in-kind contribution from the (CESC), this activity will be a $0-item in the response plan budget.

Deliverables	Delivery date
Summary Report of Existing Data and Methodology and Recommendations for Further Study	*2 Months after site visit*

Activity 3 – Develop of the Workforce Training Scope of Work
The RET will develop a project plan for workforce training. The workforce training scope of work will be informed by the in-country assessment conducted under activity 2, which will serve to identify training priorities and regional opportunities. The RET will work with the CTCN to identify a potential donors, including regional and international finance institutions, and will structure the scope of work to best meet the donor's applications requirements. The Antigua and Barbuda government (and/or other regional partners) would be responsible for completing the remaining elements of any proposal beyond the scope of work.

Initial recommendations from Antigua and Barbuda include focusing the training curriculum around renewable energy project installations, conducting price assesssments, developing viable projects, and maintaining systems. The trainings would target small and medium enterprises and would focus on in-person trainings. The trainings would be designed for working professionals with a minimum of a primary education.

Deliverables	Delivery date
	Month 3

2.2 Expertise required

- Engineer with on-site wind resource assessment experience, including assessing small and micro turbines and hurricane resistant technologies
- Renewable energy expert with workforce development experience, including developing curriculum and conducting train-the-trainer activities.

2.3 Main partners

The following, key partners have been identified. The RET should consider engaging these partners with data gathering, vetting of methodologies, and review and approval of final reports.

- Ministry of Public Utilities, Civil Aviation and Transportation
  - Electricity Division of APUA
- Ministry of Tourism, Economic Development, Investment & Energy
  - Economic Planning Unit
  - Energy Unit
- Government Statutory Bodies and the private sector;

2.4 Synergies

There are several ongoing projects, existing policies, and previous analyses of which the RET shall consider in provision of this technical assistance to Antigua and Barbuda that are described in further detail below.

<u>The following are highly relevant ongoing projects Antigua and Barbuda is conducting with other international and regional institutions:</u>

- The World Bank is exploring providing assistance to Antigua and Barbuda on analysis and recommendations regarding a potential new net-metering/net-billing/FiT policy.
- Sustainable Island Resource Framework Fund (SIRF).
  - The SIRF was established by the Environmental Protection and Management Bill in 2013. The SIRF will raise funds to invest in for-project renewable energy technology initaitives, including up to 25 MW of solar, wind, and possibly ocean thermal energy conversion. The electricity generated will be sold to the national utility, APUA, which has agreed to these purchases. Proceeds from these power purchase agreements will be funelled back to the fund.
  - Expenditures or the SIRF are guided by legislation.
- UNFCCC NAMA Facility
  - Antigua and Barbuda have submitted a policy-based NAMA to the UNFCCC NAMA Facility requesting financial and technical assistance support for implementing sustainable financing for environmental stewardship through capital investments in renewable energy. Revenues generated will be used to fund climate change adaptation and biodiversity conservation.
- International Renewable Energy Agency (IRENA)
  - IRENA has made a commitment to provide this project with in-kind co-financing. Antigua and Barbuda will benefit from this co-financing through the development of

renewable readiness assessments (RRAs). An RRA is a holistic assessment of conditions for renewable energy deployment in a country, and the actions necessary to further improve these conditions. An RRA is a rapid assessment of how a country can increase readiness and overcome the main barriers to the deployment of renewable energy technologies.

- Sustainable Pathways – Protected Areas and Renewable Energy
  - Over the 2014 – 2015 timeframe, Antigua and Barbuda is working with the United Nations Environment Programme to formalize an agreement for the SIRF Environment Fund to receive profits from renewable energy systems (see component 2.) and increase revenue for Protected Areas System by $2 million annually
    - Pilot installation of 1-4 MW wind and/or solar energy (which would generate an eventual estimated minimum of $700,000/year for PA management) with feasibility scale up of up to 50% of the AnB's energy needs at 25MW.
    - Improve management effectiveness of a financially sustainable pilot protected area -- Mount Obama National Park, and;
    - Restore surrounding watershed forests key to improved water management and eventual pumped hydro energy storage (to scale up component 2.). Reduce threat of fire to forested areas.

The following, additional policies will be considered in the development of this technical analysis:

- 2013 Sustainable Energy Action Plan: http://www.oas.org/en/sedi/dsd/Energy/Doc/EAP_AntiguaBarbuda_web.pdf
- APUA's interconnection standards[2]
- APUA's net billing program[3]

The RET shall consider the data, analysis and recommendations including within these recent analyses conducted by third parties:

- Wind Data Evaluation of Crabbs Peninsula in Antigua and Barbuda
- 2013 CARISOM Carribean Sustainable Energy Roadmap: http://www.worldwatch.org/system/files/nPhase%201%20C-SERMS%20Summary%20for%20Policymakers%20(1).pdf

2.5 Timeline

Provide a timeline for the CTCN technical assistance and list specific milestones for each activity. The timeline show the roll out of the activities and sub-activities to be conducted, throughout the whole duration of the assistance

2.6 Indicative budget

Provide an indication on the maximum amount of resources required to implement the assistance.

2.7 Gender considerations

Gender equality will be an integral part of the overall approach for technical assistance and will be included i.e. in the workforce training program (see section 1.2 above). The technical assistance as provided in the response to this request will aim for gender inclusive stakeholder processes.

[2] http://www.apua.ag/interconnection-policy/
[3] http://www.apua.ag/wp-content/uploads/2015/03/EPR-Interconnection-Policy.pdf

2.8 Risk identification and risk mitigation

Risks	Consequence	Probability	Mitigation
Technical assistance project size larger than expected	*Not all planned TA actions can be taken within the given financial limit*	*Low / medium*	*Seeking for co-funding by other sources; synergizing with other projects (e.g.from IRENA)*
Technical assistance project duration longer than expected	*Not all planned TA actions can be taken within the given time limit*	*Medium*	*Agreement with NDE ATG on revised project schedule*
Technical assistance project needs more expertise than expected	*Not all planned TA actions can be provided by CTCN*	*Low*	*External expertise should be integrated into the resulting comprehensive project proposal*

2.9 Monitoring and Reporting

Monitoring and reporting of the assistance will be in the nature of fortnightly conference calls, or as needed, between the entity providing the assistance, the CTCN and the NDE ATG.

3. Long-term impacts of the assistance

3.1 Expected climate benefits

The assistance will enable ATG to achieve a high-quality analysis of Renewable Energy Priority Technologies for Deployment. This would help ATG to develop its strategy to reduce the greenhouse gas intensity (CO2 emissions per unit GDP), and become less prone to electricity black-outs.

On the RE front, the assistance will enable ATG to bring about critical amendments to its existing RE knowledge and expertise and thus overcome key barriers hampering sustainable development and deployment of RE in ATG.

3.2 Co-benefits

The training of domestic experts will increase the workforce on wind energy in ATG with a clear benefit also to the domestic labour market.

3.3. Post-assistance plans and actions

Immediately after the completion of the assistance, using the output of the assistance, ATG will use the information and technical assistance to design and implement its INDC. It is hoped that at this

time ATG can send a fresh request to CTCN to help it in addressing issues and barriers of the kind listed in section 1.1 above.

4. Formal agreement and signatures

Signatures of the requesting country

For the NDE	For the Request Applicant
Name: Diann Black-Layne	Name: Ruleta Camacho-Thomas
Title:	Title: Deputy Director of the Environment
Date:	Date:
Signature: 	Signature: 

Signatures of the CTCN

For the CTCN Director	For the Climate Technology Manager
Name: Jukka Uosukainen	Name: ~~Harald Diaz-Bone~~ Patrick Nussbaumer
Title: CTCN Director	Title: Climate Technology Manager
Date: 22 Oct 2015	Date: 6 October 2015
Signature: 	Signature: 

Country:	Antigua and Barbuda
Request Identification Number:	2015-029/ATG-01

Title:	Technical Assistance for the Implementation of Projects related to the Establishment of a Sustainable Financial Mechanism for Climate Change in Antigua and Barbuda

1. Overview of the assistance

1.1 Objectives (outcomes)

Antigua and Barbuda currently generates nearly all of its electricity from imported fossil fuels, resulting in high costs and greenhouse gas emissions.

The government of Antigua and Barbuda is addressing ~~has determined to address~~ these challenges through several goals and policies. The 2010 National Energy Policy contains goals to reduce energy costs, diversify from fossil fuels, and develop new technologies and sectors. The 2013 Sustainable Energy Action plan builds off of the 2010 policy by providing a comprehensive roadmap for renewable energy and energy efficiency policy development, with recommendations for the creation of certain government institutions, policies, and proposed budgets. The Action Plan also includes an internal government goal to reduce public energy consumption and expenditures by 30% by 2020.

Clean Energy Goals that targets 10% electricity from renewables by 2020, 15% by 2030, and a 25% reduction in GHG emissions below 1990 by 2020.[1]

The purpose of this quick response technical assistance project is to support Antigua and Barbuda in reaching its energy and climate goals, specifically:

- Gaining energy independence away from imported fuels
- Diversifying its energy mix away from fossil fuels
- Lowering energy costs by increasing competition amongin energy providers and utilizing lower cost resources, including renewable energy
- Encouraging economic development with increased private sector participation in developing new energy projects

Additional benefits include reducing emissions by diversifying the energy mix to include greater amounts of solar PV, ~~and~~ wind, and other clean energy sources; improving the capacity of the Environment Division to support implementation of national energy policies and goals such as the design of future renewable energy projects and programs; and enhancing climate resiliency with the deployment of hurricane resistant energy generation and off grid technologies.

1.2 Results (outputs)

The following is a brief summary of the key outputs of this quick response project:

- **In-country visit** for assessment of Antigua and Barbuda's energy context, clean ~~renewable~~ energy deployment goals, INDC priorities, ~~and~~ current barriers, and possible policy, market or other solutions, including those for mobilizing private sector investment~~.~~
- **Analysis of recommendations for renewable energy technology suppliers~~renewable energy priority technologies~~**
- **Development of a scope of work for a workforce training program** in inform proposals to

[1] http://www.oas.org/en/sedi/dsd/Energy/Doc/EAP_AntiguaBarbuda_web.pdf

potential donor organizations, including regional organizations.

1.3 Technology aspects

The technical assistance will surround renewable energy and energy efficiency technologies, including on and off-grid technologies, mini grids, and storage, with special consideration for climate resilience in terms of withstanding the possibility of increased hurricanes and supporting emergency systems, such as those of hospitals and clinics.

2. Description of the Assistance

2.1 Activities

Activity 1 – In-Country Assessment

Members of the RET will conduct an in-country visit to meet with the Antigua and Barbuda NDE and key stakeholders identified in 2.3 and conduct capacity building activities. Meetings may~~will~~ include:

- Discussion of renewable energy, energy efficiency and storage goals; ~~wind energy goals~~ current policies and programs; and priorities identified in Antigua and Barbuda's INDC~~and previously conducted assessments~~
- Site visits to current or potential renewable energy project sites or other sites relevant to grid integration~~potential wind farm locations.~~
- Exploration of the opportunities and challenges to developing renewable energy, energy efficiency, and storage markets ~~a wind market~~ in Antigua and Barbuda, including the current transmission and system operations and planning processes
- Mechanisms for mobilizing private sector investment in INDC priorities
- Engaging workforce development stakeholders, such as existing relevant educational institutions and discussion of regional opportunities

Capacity building activities will be identified in further discussion with the NDE and could involve up to two days of trainings.

Deliverables	**Delivery date**
Summary Report of Key Outcomes	*3 weeks after visit*

Activity 2 – Review of Recommendations for Renewable Energy Technology Suppliers~~Analysis of Renewable Energy Priority Technologies for Deployment~~

Antigua and Barbuda has employed an outside consultant to develop recommendations for renewable energy technology suppliers. NREL will provide a third-party review of the recommendations and will offer comments to Antigua and Barbuda to suggest alternate or additional suppliers.

~~In partnership with the Clean Energy Solutions Center, a network partner of the CTCN, experts will analyze Antigua and Barbuda's renewable energy technology potentials and provide recommendations for technologies to target for deployment and possible policy support. The analysts will build off of previous analyses conducted, including the GIZ wind study, the Navigant report, others????. The recommendations will help inform activity 3 in terms of identifying priority technologies for which further workforce training may be of value. Given the in-kind contribution from the (CESC), this activity will be a $0 item in the response plan budget.~~

Deliverables	**Delivery date**

Comments on Recommendations for Renewable Energy Technology Suppliers~~Summary of Existing Data and Methodology and Recommendations for Further Study~~	*~~Month 2~~February*

Activity 3 – Develop of the Workforce Training Scope of Work
The RET will develop a project plan for workforce training. The workforce training scope of work will be informed by the in-country visit ~~assessment~~ conducted under activity 1~~2~~, which will serve to identify training priorities and regional opportunities. The RET will work with the CTCN to identify a potential donors, including regional and international finance institutions, and will structure the scope of work to best meet the donor's applications requirements. The Antigua and Barbuda government (and/or other regional partners) would be responsible for completing the remaining elements of any proposal beyond the scope of work.

Initial recommendations from Antigua and Barbuda include focusing the training curriculum around renewable energy project installations, conducting price ~~assesssments~~assessments, developing viable projects, and maintaining systems. The trainings would target small and medium enterprises and would focus on in-person trainings. The trainings would be designed for working professionals with a minimum of a primary education.

Deliverables	**Delivery date**
Scope of Work for Workforce Training Program	*March~~Month 3~~*

2.2 Synergies

There are several ongoing projects, existing policies, and previous analyses of which the RET shall consider in provision of this technical assistance to Antigua and Barbuda that are described in further detail below.

The following are highly relevant ongoing projects Antigua and Barbuda is conducting with other international and regional institutions:

- The **National Renewable Energy Laboratory** is working with Antigua and Barbuda on modeling and analysis to inform the country's INDC.
- **The World Bank** is exploring providing assistance to Antigua and Barbuda on analysis and recommendations regarding a potential new net-metering/net-billing/FiT policy.
- **Sustainable Island Resource Framework Fund (SIRF).**
  - The SIRF was established by the Environmental Protection and Management Bill in 2013. The SIRF will raise funds to invest in for-project renewable energy technology initaitives, including up to 25 MW of solar, wind, and possibly ocean thermal energy conversion. The electricity generated will be sold to the national utility, APUA, which has agreed to these purchases. Proceeds from these power purchase agreements will be funelled back to the fund.
  - Expenditures or the SIRF are guided by legislation.
- **UNFCCC NAMA Facility**
  - Antigua and Barbuda have submitted a policy-based NAMA to the UNFCCC NAMA Facility requesting financial and technical assistance support for implementing sustainable financing for environmental stewardship through capital investments in

renewable energy. Revenues generated will be used to fund climate change adaptation and biodiversity conservation.

- **International Renewable Energy Agency (IRENA)**
  - IRENA has made a commitment to provide this project with in-kind co-financing. Antigua and Barbuda will benefit from this co-financing through the development of renewable readiness assessments (RRAs). An RRA is a holistic assessment of conditions for renewable energy deployment in a country, and the actions necessary to further improve these conditions. An RRA is a rapid assessment of how a country can increase readiness and overcome the main barriers to the deployment of renewable energy technologies.
- ~~**ECPA**~~
  - ~~???~~
- **Sustainable Pathways – Protected Areas and Renewable Energy**
  - Over the 2014 – 2015 timeframe, Antigua and Barbuda is working with the United Nations Environment Programme to formalize an agreement for the SIRF Environment Fund to receive profits from renewable energy systems (see component 2.) and increase revenue for Protected Areas System by $2 million annually
    - Pilot installation of 1-4 MW wind and/or solar energy (which would generate an eventual estimated minimum of $700,000/year for PA management) with feasibility scale up of up to 50% of the AnB's energy needs at 25MW.
    - Improve management effectiveness of a financially sustainable pilot protected area -- Mount Obama National Park, and;
    - Restore surrounding watershed forests key to improved water management and eventual pumped hydro energy storage (to scale up component 2.). Reduce threat of fire to forested areas.

The following, additional policies will be considered in the development of this technical analysis:

- 2013 Sustainable Energy Action Plan: http://www.oas.org/en/sedi/dsd/Energy/Doc/EAP_AntiguaBarbuda_web.pdf
- APUA's interconnection standards[2]
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The RET shall consider the data, analysis and recommendations including within these recent analyses conducted by third parties:

- Wind Data Evaluation of Crabbs Peninsula in Antigua and Barbuda
- 2013 CARISOM Carribean Sustainable Energy Roadmap: http://www.worldwatch.org/system/files/nPhase%201%20C-SERMS%20Summary%20for%20Policymakers%20(1).pdf

Annex 3: Terms of Reference for assistance provider *(in case of tendering process, and in line with UNOPS template/requirements TBD)*

[2] http://www.apua.ag/interconnection-policy/
[3] http://www.apua.ag/wp-content/uploads/2015/03/EPR-Interconnection-Policy.pdf