ICAT Final Project Report: Antigua & Barbuda

National Transport Electrification Impact Assessment

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Project Phase: Phase 2
Project Start Date: 08/07/2022
Project End Date: 20/03/2024

DISCLAIMER

PREPARED UNDER

The Initiative for Climate Action Transparency (ICAT), supported by Austria, Canada, Germany, Italy, the Children's Investment Fund Foundation and the ClimateWorks Foundation.

The ICAT Secretariat is managed and supported by the United Nations Office for Project Services (UNOPS)

BACKGROUND

As is characteristic of a small island developing state (SIDS) country, Antigua & Barbuda experiences a disproportionate level of risk from natural disasters including those related to climate change. Drought, tropical waves, depressions, storms, and hurricanes are relatively common.

According to the World Bank,[1] Antigua & Barbuda is ranked as a high-income country but has been severely impacted by the COVID-19 pandemic, with a reported annual growth rate of -20.2% in 2020. This recession in the GDP is mainly attributed to the service-oriented economy of Antigua & Barbuda, with tourism contributing approximately 60% of GDP and 40% of investments. The COVID-19 pandemic caused a halt to major tourism activities and visitor arrivals. This, combined with the impacts on the other sectors, resulted in the decline in GDP of more than 20%.

NDC PRIORITIES AND TARGETS

Antigua & Barbuda is committed to implementing measures to establish a low carbon and sustainable country. This is evident in the actions related to the updated NDCs. Antigua and Barbuda's updated NDC[2] was submitted in September 2021. This updated NDC included the following overarching economy-wide "conditional" on international climate finance targets:

1. By 2030, 86% of renewable energy generation from local resources in the electricity sector
2. By 2030, 100% of all **new** vehicle sales to be electric vehicles
3. By 2025, explore the potential for emissions reductions in the waste sector
4. By 2030, explore the potential for emissions reductions in the Agriculture, Forestry, and Other Land Use (AFOLU) sector

The updated NDC further highlighted the following specific transport and broader electricity generation related measures:

Transport – All **Conditional**

a. Change fiscal policies on fossil fuels by 2025 to enable the transition to 100% renewable energy generation in the transportation sector
b. By 2030, ban on the importation of new internal combustion engine (ICE) vehicles (with an indicative start year of 2025)
c. By 2035, 100% of government vehicles will be electric vehicles (EVs)
d. By 2020, establish efficiency standards for the importation of all vehicles

Electricity – All **Conditional**

a. By 2030, 100 MW of renewable energy generation capacity will be available to the grid
b. By 2030, 50 MW of renewable energy generation capacity will be owned by farmers who can sell electricity to off-takers

[1] https://data.worldbank.org/country/antigua-and-barbuda?view=chart

[2] https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Antigua%20and%20Barbuda%20First/ATG%20-%20UNFCCC%20NDC%20-%202021-09-02%20-%20Final.pdf

c. By 2030, 100 MW of renewable energy generation capacity will be owned by social investment entities (e.g., Social Security Board, Medical Benefit Scheme, non-governmental organisations, faith-based organisations, community-based organisations, taxi associations, bus associations, and other businesses registered as social investors)
d. By 2030, 20 MW of wind-powered energy generation
e. By 2030, 100% renewable energy generation for all government operations 2030
f. By 2030, 100% of fixtures and appliances in government buildings will be energy efficient
g. By 2030, elimination of the fuel surcharge tax on electricity bills
h. By 2025, finalise the technical studies with the intention to construct and operationalise a waste to energy (WTE) plant

As part of this updated NDC, Antigua & Barbuda developed a just transition strategy. This strategy included a baseline analysis for the electricity and road transport sectors.[3] The transition strategy report analysed the employment impacts for scenarios in the electricity and road transport sector based on the updated NDCs compared to the business-as-usual (BAU) scenario. The report indicates that although the job potential in the NDC scenario is much higher than the BAU scenario, there are cases affecting fuel supply or vehicle mechanical repair where considerations need to be given for the decline in job opportunities in these areas.

These more specifically elaborated NDC measures call for added mitigation MRV analysis capabilities to quantify the ex-ante and ex-post GHG progress and other social and environmental impacts of policies.

PROJECT GOALS

The project focused on institutionally embedding modelling capacity to conduct both *ex ante* and *ex post* GHG emission mitigation impact analysis of its electric mobility transition measures. Phase 2 project goals built upon the modelling capabilities established through the Phase 1 project and specifically included:

1) To select and develop transport modelling tool(s) and input datasets to assess the GHG and other sustainable development (SD) impacts of policies and climate finance interventions aimed at a national electric mobility transition;
2) To analyse the GHG emission reductions and other selected sustainable development impacts of electric mobility transition policies and actions, including a focus on air quality impacts;
3) To strengthen the capacity of the Antigua & Barbuda government to use, maintain, and improve their transport modelling capabilities for policymaking, NDC updates, UNFCCC reporting, and other reporting requirements.

[3] https://climateanalytics.org/publications/2021/towards-a-just-transition-of-the-workplace-baseline-analysis-for-the-electricity-and-road-transport-sectors-in-antigua-and-barbuda/

SUMMARY OF ACTIVITIES, OUTPUTS, AND OUTCOMES OF THE PROJECT

The scope of work of the project included the following activities:

Activity 0. Conduct inception phase

Regular consultations with the Department of the Environment (DOE) and other key stakeholders were conducted by the project team throughout the project. During the inception workshop, the initial views and concerns of stakeholders were elicited to guide the development of the modelling frameworks and desired outputs. This consultation work was done in close coordination with the SLIM project that is currently piloting use of country electric vehicles for select applications in the country. An inception report was prepared summarizing the results of the workshop.

Activity 1. Select transport modelling tool(s) appropriate to supporting electric mobility policy making in Antigua & Barbuda

The scope of the project was defined based upon inputs from in-country stakeholders and decisions made by the DOE, including the desired modelling capabilities and the breadth of transport activities. It was decided the project would only address on-road transport, and focus on GHGs, while establishing the data and modelling capabilities to address other air pollutant impacts. The following modelling tools were selected to assess impacts of the country's NDC-related planned electric mobility GHG mitigation measures:

- ICAT Transport Climate Action Data Tool (TraCAD) https://climateactiontransparency.org/our-work/icat-toolbox/tracad/
- Long-range Energy Alternatives Planning (LEAP) System https://leap.sei.org/default.asp?action=home

Activity 2. Training on selected transport modelling tools

Training was conducted on the selected modelling tools from Activity 1. Trainings addressed how to use selected modelling software tools, input datasets, and data collection procedures. The training events specifically included the following sessions:

- A virtual training on TraCAD was delivered by Climate SI (12-15 June, 2023)
- An in-person training on LEAP was delivered by the Caribbean Cooperative MRV Hub (CCMRVH) with focus on transport electrification modelling assessments (10-12 July, 2023)

Reports on both training events were prepared .

Activity 3. Elaborate selected transport modelling tools(s), collect input data, and institutionalise collection processes

This activity elaborated a quantitative representation of transport activities, equipment, and demand in Antigua & Barbuda in the selected modelling tools. Working closely with the DOE, the A&B Transport Board, the SLIM project team, and other key stakeholders, data was collected,

and electric mobility GHG mitigation actions were characterised within the appropriate model(s), including specifying relevant quantitative assumptions and targets for each. A targeted consultation workshop with the SLIM project team was conducted (13 July 2023). Data input and collection processes were documented and archived. Draft data collection manual specific for the transport sector, was produced.

Activity 4. Transfer new inputs and outputs from transport modelling into LEAP and GACMO

This activity involved improving the input data, resolution, and assumptions in Antigua & Barbuda's economy-wide GHG mitigation modelling tools (i.e., GACMO and LEAP) based on the outputs from Activity 2. The impact of select electric mobility transition scenarios on electricity demand were assessed using LEAP, as well as the impact on GHG emissions associated with that transition from varying renewable energy transition scenarios. An electric power mitigation analysis scenario report was drafted addressing results from this modelling work. An updated LEAP and GACMO data collection manual (from ICAT phase 1 project) addressing transport improvements was also be prepared.

Activity 5. Validate assessment outputs with stakeholders

A workshop was held with select stakeholders, identified by DOE, to review and validate the assumptions and results of the modelling and assessment (24 January, 2024). A validation workshop report was prepared.

Activity 6. Integrate and inform electric mobility implementation projects in country

This activity involved two events. The first workshop focused on the experts that are and will be involved in implementation of electric mobility projects to identify how the analytical capabilities resulting from this ICAT project can be integrated into the assessment of the impacts of coming projects in Antigua & Barbuda. This event was held with Climate Analytics on 20 February, 2024. The second event focused on policy makers in government and other relevant public and private stakeholders. The purpose of this event was to inform them about and promote the value of the new transport sector analytical capabilities developed through this project so that these stakeholders will utilise and integrate these capabilities into concrete electric mobility policies and investment decision making. This event was conducted in conjunction with the Antigua & Barbuda national Technical Advisory Committee meeting on 21 February, 2024.

Activity 7. Document and institutionalise mitigation modelling capabilities for country

The results of project were documented in an electric mobility transition impact modelling final report. A final detailed documentation and procedures manual for how to collect updated and new data for the selected transport modelling tools was also be prepared. Lastly, final versions

of all modelling tools were documented within the software itself and properly archived for future use.

The tables below summarize workplan deliverables and project outcomes.

Work Plan Deliverables	Deliverable description	Challenges, opportunities, and/or recommended next steps for future related activities and outputs
A. Inception workshop	Inception workshop with stakeholders confirmed through consultations	No major challenges faced during the development of this Output.
B. Inception workshop report	Report on participation and summarizing discussion and feedback.	No major challenges faced during the development of this Output.
C. Monthly progress reports (description below)	Monthly project status reports with national consultant, DOE, and GHGMI support team	This output was highly useful in providing transparency with respect to project management and progress, and it is recommended other ICAT projects follow a similar approach.
D. Transport tool selection justification report	A structured analysis was conducted of the available modelling tools and comparisons made with respect to the prioritized needs of Antigua & Barbuda. A brief tool selection justification report on this analysis was prepared.	No major challenges faced during the development of this Output.
E. Training sessions and ICAT participant surveys	Trainings addressed how to use selected modelling software tools, input datasets, and data collection procedures. Training surveys were conducted. The training events specifically included the following: • A virtual training on TraCAD was delivered by Climate SI • An in-person training on LEAP was delivered by the CCMRVH with focus on transport electrification modelling assessments	There were some challenges faced by the team dealing with the still “beta” version of the TraCAD tool, as there were some capabilities that were not well documented or fully implemented at the time, but the training event was nonetheless successful.
F. Training Reports	Training reports on both training events was completed.	No major challenges faced during the development of this Output.
G. Transport implementation project alignment workshop	A targeted consultation workshop with the SLIM project team was conducted for the purpose of coordinating data collection and to ensure that modeling capabilities would be applicable to other in-country projects.	No major challenges faced during the development of this Output.
H. Transport implementation project alignment workshop report	A report on this event was prepared.	No major challenges faced during the development of this Output.
I. Fully elaborated transport model(s)	Fully documented and archived input data to transport models was prepared. And elaborate versions of TraCAD and LEAP with input data and assumptions were prepared.	Some delays were faced due to the ‘beta’ version nature of the TraCAD tool but were overcome with support from Climate SI.

Work Plan Deliverables	Deliverable description	Challenges, opportunities, and/or recommended next steps for future related activities and outputs
J. Draft Transport model/tool data collection process manual	It was decided that the data collection manual for LEAP, GACMO, and TraCAD would be integrated into one overall manual given the overlaps in information (i.e., this output was combined with Output M)	No major challenges faced during the development of this Output.
K. Draft electric mobility transition scenario impact assessment report	An electric mobility transition scenario impact assessment report to summarize the results from and capability of models	No major challenges faced during the development of this Output.
L. Updated versions of LEAP and GACMO	Archive a fully documented updated version(s) of LEAP and GACMO with revised transport input data	No major challenges faced during the development of this Output.
M. Updated LEAP and GACMO data collection procedures manual	It was decided that the data collection manual for LEAP, GACMO, and TraCAD would be integrated into one overall manual given the overlaps in information (i.e., this output was combined with Output J)	No major challenges faced during the development of this Output.
N. Draft electric power mitigation analysis scenario report	The impact of select electric mobility transition scenarios on electricity demand were assessed using LEAP, as well as the impact on emissions associated with that transition from varying renewable energy transition scenarios. An electric power mitigation analysis scenario report was drafted addressing results from this modelling work.	No major challenges faced during the development of this Output.
O. Validation workshop	A workshop was held with select stakeholders to review and validate the assumptions and results of the modelling and assessment.	No major challenges faced during the development of this Output. Useful feedback on modeling assumptions was obtained from stakeholders that resulted in improvements in the models.
P. Validation workshop report	A validation workshop report was prepared.	No major challenges faced during the development of this Output.
Q. Transport assessment model planning workshop	The workshop focused on the experts that are and will be involved in implementation of electric mobility projects understand how the analytical capabilities resulting from this ICAT project can be integrated into the assessment of the impacts of coming projects in Antigua & Barbuda. This event was held with Climate Analytics on 20 February 2024.	No major challenges faced during the development of this Output.
R. Transport assessment model capabilities workshop	The event focused on policy makers in government and other relevant public and private stakeholders. The purpose of this event was to inform and promote with them the value of the new transport sector analytical capabilities developed through this project so that these stakeholders will utilise and integrate these capabilities into concrete electric mobility policies and investment decision making. This event was conducted in conjunction with the	No major challenges faced during the development of this Output.

Work Plan Deliverables	Deliverable description	Challenges, opportunities, and/or recommended next steps for future related activities and outputs
	Antigua & Barbuda national Technical Advisory Committee meeting on 21 February 2024.	
S. Transport assessment workshop reports	A report was prepared in the above two workshops	No major challenges faced during the development of this Output.
T. Final electric mobility transition scenario impact assessment report	Final version of this report was archived following revisions based on validation workshop and review comments.	No major challenges faced during the development of this Output.
U. Final electric power mitigation analysis scenario report	Final version of this report was archived following revisions based on validation workshop and review comments.	No major challenges faced during the development of this Output.
V. Final transport model/tool data collection process manual	Final version of this manual was archived following revisions based on validation workshop and review comments.	No major challenges faced during the development of this Output.
W. Fully documented version of modelling tool(s)	Final documentation was added to models for future use and institutional memory.	No major challenges faced during the development of this Output.

Work Plan Expected Outcomes	Final Status	Provide a narrative of observed outcomes; including any challenges, future opportunities, and signs of project sustainability
Antigua & Barbuda has institutionally embedded modelling capacity to conduct both *ex ante* and *ex post* GHG emission mitigation and select SDG impact analysis of its electric mobility transition measures as part of its future national MRV/transparency system under the Enhanced Transparency Framework of the Paris Agreement.	Met	Further work would be needed to be able to fully analyze a broader range of SDGs. Currently only air pollution modelling capacity is developed and integrated into the national MRV system to support ongoing ETF work and NDC updates.
Policymakers in Antigua & Barbuda are well equipped with information on the benefits and costs for evidence-based policymaking and mobilizing finance on electric mobility, including the more effective implementation of GEF and GCF-funded transport projects.	Met	The key policy makers in Antigua & Barbuda as well as stakeholders actively engaged in electric mobility projects (ongoing and planned) are well informed of the capacities created through this project. Although, ongoing outreach and reminders by the DOE and CCMRVH would still be warranted to ensure the capabilities are utilized.

THE USE AND APPLICABILITY OF ICAT TOOLBOX AND THE IMPLEMENTATION OF THE PROJECT'S CAPACITY BUILDING PLANS

Through the TraCAD tool, the ICAT Transport Pricing guidance was utilized in this project. The project faced some difficulties in accessing and using the TraCAD tool due to its "beta version" status. But, the team at Climate SI were responsive and helpful in addressing the project team's needs and questions.

RECOMMENDATIONS FOR NEXT STEPS

This project successfully achieved all its outputs and expected outcomes and did so on schedule. Like in Phase 1, the country's partnership with the CCMRVH was critical to the project's success. And the country's ongoing membership in the CCMRVH will promote sustainability of their newly acquired modeling capabilities. It is recommended that the country work with the CCMRVH and its new tools in preparation for its BTR.

RECOMMENDATIONS FOR POTENTIAL PHASE 3 PROJECT ACTIVITIES

The country is eager to initiate discussion on a Phase 3 project with ICAT, with a possible focus on just transition analysis of its renewable and electric mobility transitions. In-country stakeholders and focal point have been highly supportive of the first two phases. The country is a SIDS with limited capacity to support mitigation planning and implementation. Yet, is receiving international climate finance to implement mitigation projects.

LESSONS LEARNED

Key lessons include:

- There is no substitute for the selection of competent and motivated national experts. These national experts do not need deep expertise in the project scope (i.e., they can be trained and guided by the international support team), but they must be motivated to learn and perform for the project to be successful. The pairing of national experts with known regional experts also proved highly effective.
- Like in Phase 1, the process of having national consultants prepare monthly progress reports and submit them to national focal point and the international support partner was highly valuable and something we would recommend all projects include in their workplans.
- Establishing in the workplan more numerous and specific stepwise outputs, including iteration (multiple drafts) built into some key outputs, proved valuable in helping structure and give clarity to national consultants of what was expected of them and when.
- ICAT should ensure that its modeling tools are well documented and tested prior to encouraging countries to deploy them. Some delays and frustration on the part of the project team was encountered due to the "beta" version status of TraCAD.

PHOTOS AND GRAPHICS

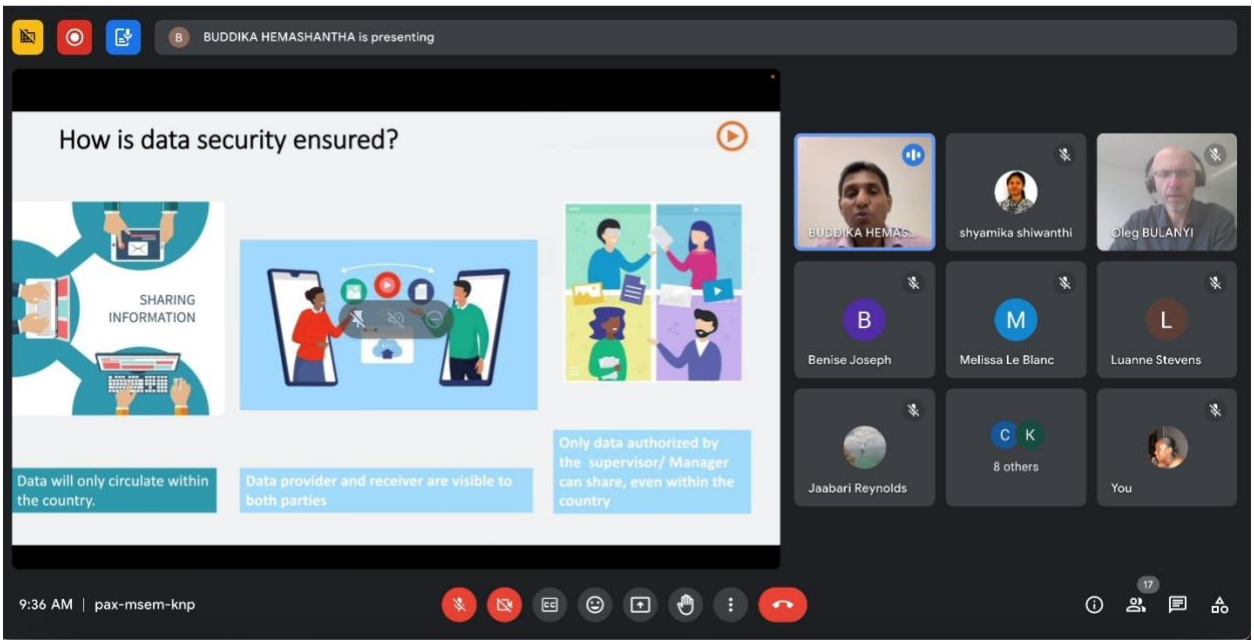
Inception workshop (Hybrid – virtual and in-person)

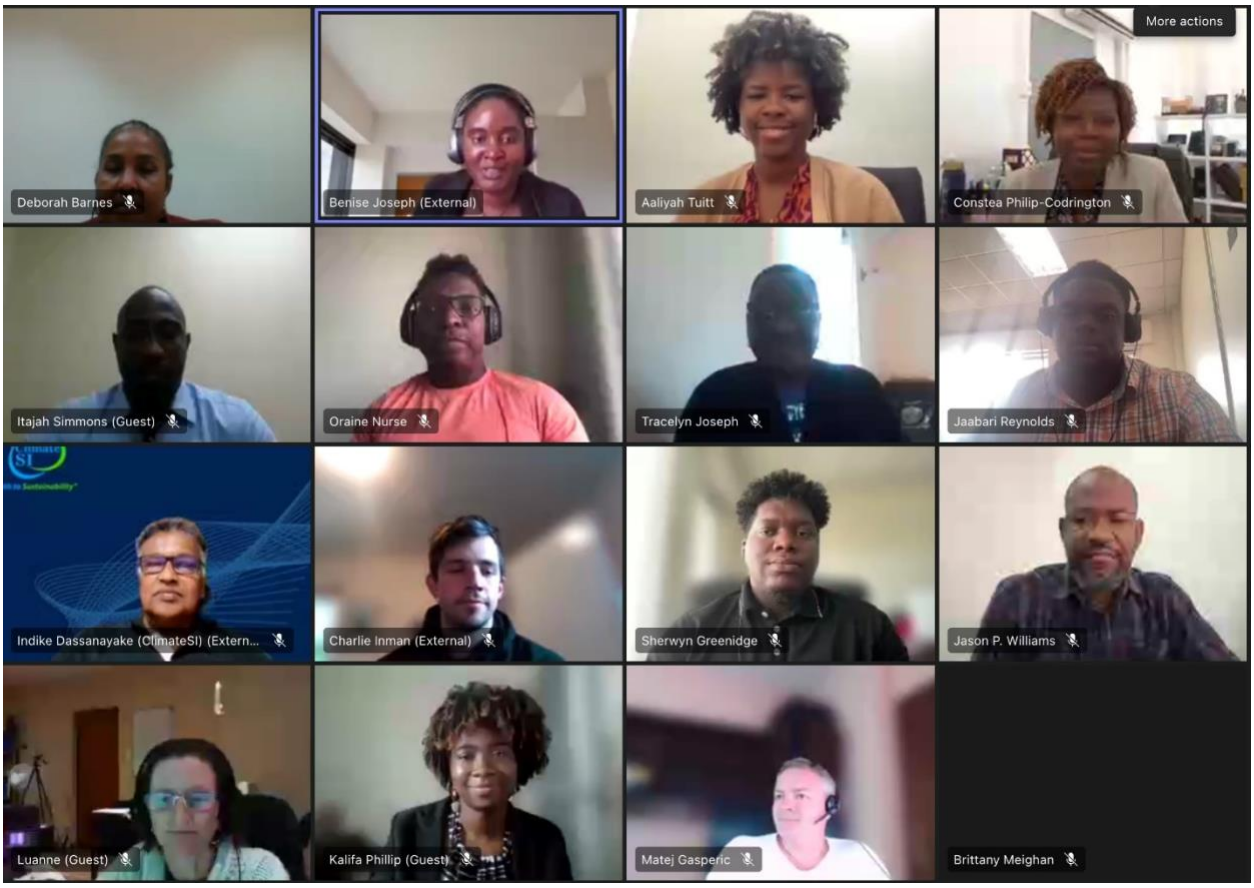

ICAT
Initiative for
Climate Action
Transparency
BM
BJ
SG
JR
CI
MG
BM
CJ
K
BJ

LEAP training workshop (in-person)


Key Characteristics

TraCAD training (virtual)




More actions
Deborah Barnes
Benise Joseph (External)
Aaliyah Tuitt
Constea Philip-Codrington
Itajah Simmons (Guest)
Oraine Nurse
Tracelyn Joseph
Jaabari Reynolds
Indike Dassanayake (ClimateSI) (Extern...
Charlie Inman (External)
Sherwyn Greenidge
Jason P. Williams
Luanne (Guest)
Kalifa Phillip (Guest)
Matej Gasperic
Brittany Meighan

Validation workshop (Hybrid – virtual and in-person)