BUILDING NATIONAL MITIGATION SCENARIO MODELLING CAPABILITIES

INITIATIVE FOR CLIMATE ACTION TRANSPARENCY (ICAT) PROJECT

STAKEHOLDER ENGAGEMENT WORKSHOP
12TH FEBRUARY 2021

MEETING REPORT

Table of Contents

Acronyms and Abbreviations

BUR	Biennial Update Report
CAEP	Climate Action Enhancement Package
CBIT	Capacity Building Initiative Transparency
CCMRVH	Caribbean Cooperative Monitoring, Reporting and Verification Hub
DMU	Monitoring, Evaluation and Data Management Unit
DOE	Department of Environment
EPMA	Environmental Protection and Management Act
GEF	Global Environment Facility
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas
GHGMI	Greenhouse Gas Management Institute
ICAT	Initiative for Climate Action Transparency
MRV	Monitoring, Reporting and Verification
NC	National Communications
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organization
SDG	Sustainable Development Goal
SIDS	Small Island Developing States
UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services
LEAP	Low Emissions Analysis Platform
GACMO	The Greenhouse Gas Abatement Cost Model
WTE	Waste to Energy

Summary

The Department of Environment (DOE) convened its first formal Stakeholder Engagement Workshop on the 12th February 2021 for the **Initiative for Climate Action Transparency (ICAT) project** that has the aim of **Building National Mitigation Scenario Modelling Capabilities.** This project is funded by the United Nations Office for Project Services (UNOPS). The main objective of this project is to assess the impact of climate policies and actions and ensure that participating countries fulfill their transparency commitments. The project is country driven, seeking to provide capacity development to countries that already have existing Monitoring, Reporting and Verification Systems (MRV) and other mitigation or adaptation initiatives. The project is dependent on highlighting national priorities and seeks assistance from national experts while encouraging peer-to-peer learning.

The workshop was geared towards updating stakeholders on the selected mitigation models, the project direction and stakeholder capacity building. The stakeholders' workshops; formal and informal are of utmost importance for the scoping of the project, selection of the modelling tools and overall success of the project. Stakeholders play an integral role in providing the data necessary for the models. Their commitment and collaboration are necessary for fulfilling their personal development objectives as well as Antigua & Barbuda's goal to acquire a growing economy in a sustainable and a low carbon emitting country.

The meeting was hosted virtually using the Microsoft Teams platform. The attendees were asked to use the provided chat window to indicate their names, agency, sector, and job title (See Annex 2). The meeting was executed as follows:

- Opening Remarks
- Part I. ICAT Project Overview
- Part II. Project Output Scope
- Mentimeter discussion
- Discussion on the Modelling Tools
- Next Steps & Closing

All meeting materials can be found at this link. These sessions are summarized below with a detailed agenda in Annex 1.

Welcome and Introduction

Ms. Anik Jarvis, member of the ICAT National Coordinating team welcomed the stakeholders to the engagement workshop. She acknowledged the presence of the stakeholders and how their continued interest will contribute to the success of the project. Further, she asked the team behind the ICAT project to introduce themselves, to familiarize stakeholders on the players involved and their functions. The attendees were encouraged to participate throughout the engagement workshop as their input contributes to the scope and ultimately, the success of the project.

Part I. ICAT Project Overview

Mr. Oraine Nurse, project lead and a member of the ICAT National Coordinating team conducted Part I of the inception meeting. His presentation was as follows:

Brief Overview:

The project lead provided a brief overview of the project's timeline being 11 months, with UNOPS being the donor agency and a grant funding amount of USD$167,769.00. He explained the project's objectives and the two approaches used to establish those objectives through:

1. Increasing the overall transparency capacities of countries, including the capacity to assess the contribution of climate policies and actions on countries' development objectives and
2. Providing appropriate methodological information and tools to support evidence-based policymaking.

He further lamented that the project is country driven and that ICAT seeks to work on already established mitigation goals and objectives whilst improving capacity development. He stated that the stakeholder workshops conducted thus far, have been necessary to take into consideration the national priorities of Antigua and Barbuda and that key stakeholders are crucial to the production of datasets for the project.

Background:
The project lead presented on Antigua and Barbuda being a Small Island Developing State (SIDS), that is vulnerable to natural disasters influenced from climate change. To this end, Antigua & Barbuda is committed to growing their economy in a low carbon and sustainable manner. He elaborated that the DOE is responsible for climate monitoring, reporting and verification function and seeks to operationalize an Environment Registry. This registry is being developed under the newly implemented Global Environment Facility (GEF) funded Capacity Building Initiative Transparency (CBIT) project to house the MRV data and support its functions.

The participants were then informed that Antigua & Barbuda has submitted four GHG inventories which includes the first National Communication (NC1), the second National Communication (NC2), the third National Communication (NC3) and their First Biennial Update Report/ National Inventory Report (BUR1/NIR). The fourth NC is ongoing and would cover the years 2016 to 2019.

Project Objectives:
The project objectives were presented as follows:

1. To develop national modelling framework(s) and an underlying input dataset for Antigua & Barbuda;
2. To prioritise and parameterise GHG mitigation policies and actions for analysis with relevant stakeholders;
3. To strengthen the capacity of the Antigua & Barbuda government to maintain, use, and improve their national mitigation modelling capabilities for future analyses.

Emphasis was placed on the Model produced being continuously used, maintained, updated and improved to support the assessing and reporting on GHG emissions.

Expected Outcomes:
The project lead further presented the expected outcomes of the project as follows:

1. Antigua & Barbuda will have sustainable capacity to conduct economy wide GHG emission projections and mitigation analysis modelling
2. Antigua & Barbuda will have the capacity to apply good practice and tools that integrate transparency of climate policies and actions

3. Policymakers in the country being well equipped to identify domestic benefits and synergies from enhanced climate action and policy transparency which would include mobilizing finances.

Scope of Work:

The project lead briefly discussed the activities outlined in the project. He explained there are six (6) expected activities associated with the project and highlighted the completion of Activity 0- Conduct Inception phase which was held virtually on the 14th December, 2020. He indicated the outputs from that workshop were the completed inception workshop report and video recording of the workshop. Further, he highlighted Activity 1- *define desired model output capabilities for Antigua and Barbuda* was mostly completed, since the models Low Emissions Analysis Platform (LEAP) and Greenhouse Gas Abatement Cost Model (GACMO) were selected.

Part II. Formal Bilateral Outreach and Proposed Project Output Scope

Formal Bilateral Outreach Completed

Dr. Donnie Boodlal, CCMRVH consultant, initiated his presentation by welcoming stakeholders and encouraging their continued interest in the ICAT project. He continued by reminding stakeholders of the completion of the first formal bilateral Outreach; the Inception Workshop held on the 14th December, 2020. He provided brief bulletin points to update stakeholders that were absent on the topics discussed during the workshop. They were as follows:

- What is a GHG mitigation assessment?
- Why conduct a GHG mitigation assessment?
- The link between GHG inventories and GHG mitigation assessment
- An overview of GHG mitigation assessments (preparations, steps, sample structure)
- Proposed functionality of Antigua and Barbuda's modelling framework
- Solicited feedback and suggestions to further scope the project output
- Comparisons of modelling tools

Dr. Boodlal continued with talks of the second formal bilateral outreach, which involved discussions with the energy stakeholders on January 12th, 2021. He explained that the project team gave a synopsis of the project to these stakeholders and they contributed to providing solicited feedback and suggestions to further scope the project output. He further reiterated the information

provided at the inception workshop (inception workshop report here) to assist in providing context to show where GHG mitigation falls, against the backdrop of UNFCCC reporting obligations. He aimed to demonstrate where GHG inventories is integrated and how it interacts with GHG mitigation using a flowchart (***See Figure 1***).

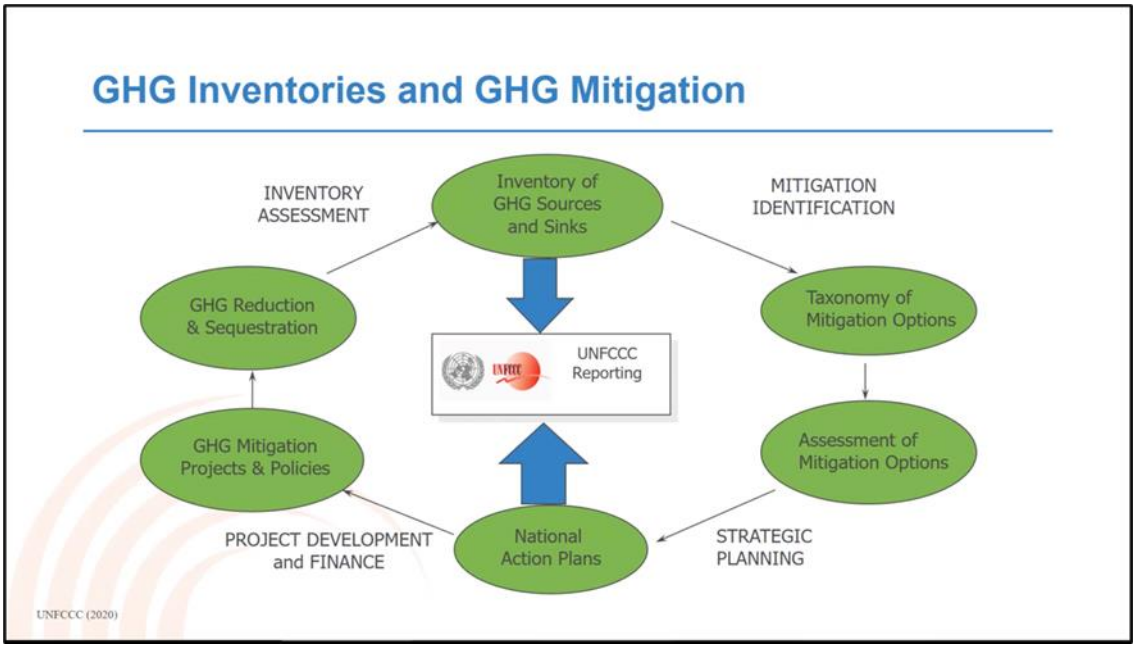

Figure 1. Flowchart showing the reporting steps to the UNFCCC

An Overview of Stakeholder's Feedback Received

Dr. Boodlal reiterated ICAT is a country driven project and as such, there was a need to move from a broad concept for Antigua and Barbuda mitigation, to more focused mitigation modelling. He stressed that the feedback from stakeholders would ultimately assist in the scoping the project and proceeded to share the feedback received thus far, from bilateral outreach. The feedback was summed as follows:

- A desire to model all sectors with energy demand, electricity generation, transport and waste being most popular.
- A desire to include a broad spectrum of mitigation technologies with renewable energy and electric vehicles being most popular.
- A strong desire for annual slices up to 2030 with a minority desire for sub-annual up to 2050

- A desire for assessing co-economic impacts an important element for the Antigua and Barbuda.
- A strong desire for assessing non-climate impacts such as reducing non-GHG & air pollution, job impacts, energy security *etc*.
- Most stakeholders present outlined that achieving the NDC targets and Energy Security should be the highest priorities for Antigua and Barbuda.

Proposed Project Output Scope

Dr. Boodlal explained that based on the feedback received, a proposed project output scope was prepared. He expressed that aside from the feedback, the energy policies, reforms and targets for Antigua and Barbuda were also factored in the process. These policies and targets were presented in ***Figure 2***. He explained that the documents will not be taken as is, and more work needs to be done but there was enough information along with the feedback to commence the project output scope.

NEP (2011)	NDC (2016)	National GHG Reduction Strategy (2020) – Revised NDC Considerations
Targeted efficiency and conservation measures designed to reduce the overall energy intensity of the economy within ten years by 10% below the 2010 baseline.	By 2020, establish efficiency standards for the importation of all vehicles and appliances.	To phase-out the use of internal combustion vehicles by 2040
Reformed market framework and mandated targets to achieve 15% renewable energy in the electricity supply by 2030.	By 2030, achieve an energy matrix with 50 MW of electricity from renewable sources both on and off-grid in the public and private sectors.	To phase-out the use of fossil fuels in the power sector by 2030;
	By 2020, finalize the technical studies with the intention to construct and operationalize a waste to energy (WTE) plant by 2025.	
	By 2030, all remaining wetlands and watershed areas with carbon sequestration potential are protected as carbon sinks.	

Figure 2 showing the Energy Policies, Reforms and Targets.

Dr. Boodlal presented that mitigation assessment usually consists of two (2) scenarios. One being **Baseline Scenarios** or also referred to as 'Business as Usual' Scenario. He explained that this scenario depicts how GHG emissions in Antigua and Barbuda projected in the future can look if there are no new policies implemented. Therefore two 2 Baseline scenarios are proposed for Antigua and Barbuda:

- 1 scenario reflecting current trends with existing measures for ALL sectors
- 1 scenario reflecting a baseline without measures – useful for showing impact of existing policies and measures

He stressed that these are baseline scenarios and they do not incorporate new planned policies and measures. However, the new plans and policies will be analyzed in the **Mitigation Scenarios**. The proposal for the mitigation scenarios is summed up as follows:

- The modelling of individual policies, reforms and targets for the energy supply and energy demand sectors (including transport) and to also include the WTE target
- Individual policies, reforms and targets implemented as individual scenarios and used for generation of Marginal Abatement Cost Curves (MACCs)
- Individual measures can then be combined in different combinations to create representations of overall integrated strategies. For example:
    - 1 scenario reflecting NDC targets
    - 1 reflecting a more ambitious target
- Forward-looking scenarios created to 2050, with focus on 2030 results (for NDC).
- To include non-energy sector emissions (historical and projections) to make modeling results comparable to most recent GHG inventories.
- To be available in future to be used and improved by A&B agencies (e.g., for next NDCs/BURs or for monitoring measure implementation).

Mentimeter Discussion

Ms. Benise Joseph, Programme Associate at the CCMRVH, led the mentimeter discussion. She welcomed all the stakeholders and thanked them for their continued interest and assistance in the project. She reminded the stakeholders of how important their participation and feedback are and contributes to supporting the project needs for Antigua and Barbuda.

The questions and responses during the mentimeter discussion are as follows:

1. **Are there any other policy document that we should consider in our assessment?**

The responses included Biennial Update Report, Renewable Energy Roadmap, Land Use Policy, Electricity Act 2015, Renewable Energy Act, Medium Term Strategic Development Plan, Sustainable Island Resource Zoning and Management Plan.

2. **Are there any specific GHG mitigation projects (ongoing or planned) that we should consider in our assessment?**

The responses included Sustainable Low Emission Island Mobility Project, implementation phase of an energy efficient project in public buildings, transformation of the water and health sector (IRENA/ADFD) Phase 2, GCF Readiness projects and a list of other ongoing DOE projects being provided, if needed.

3. **How do you the stakeholders feel about our proposed output scope?**

The responses ranged from very good and satisfactory being the most voted, followed by Excellent.

The stakeholders were finally asked to comment on whether they had any remaining questions for the team or clarifications on the presentations thus far. Some of the questions were:

1. **Will you be doing an impact assessment for each policy/ project?** Dr. Boodlal answered in the affirmative.
2. **How committed is the Government to the project?** The Project Lead, Oraine Nurse and Data Manager, Jason Williams stated that the project is about capacity building for Antigua and Barbuda and as such there is full commitment towards the project.
3. **Will the private sector have access to the models, LEAP in particular?** Oraine answered in the affirmative and stated that the GACMO model would be most accessible since it is free access.

One comment given by a stakeholder is to include one more output in the mitigation scenario; comparing existing policies with new ones.

Modelling Tools

Dr. Boodlal presented on the functional aspects of the modelling tools. He explained that the modelling tools being presented, are the ones that seemed most suitable for the needs of Antigua and Barbuda.

Functional Synopsis on Each Tool (GACMO)

Dr. Boodlal expressed that GACMO is an excel based GHG modelling tool, capable of covering all sectors with a wide variety of mitigation actions. It is open access and very useful for quantifying emission reduction and cost for selected mitigation actions. He further explained that some of the caveats involved are projection pathways are exogenous to the model, which means that growth rates are defined by the users and additionally GACMO has little energy supply/demand linkages in the model outputs. Dr. Boodlal related that though there are some limitations with the tool, it is very easy to use and learn and fits the desired needs to a wide extent.

Functional Synopsis on Each Tool (LEAP)

Dr. Boodlal explained that

- LEAP is a window based GHG modelling tool, capable of covering all sectors with a wide variety of mitigation actions (more detailed for the energy sector).
- Though not open access, it has been offered free to Antigua and Barbuda for this project. Projection pathways are endogenous to the model (by linking with GHG emission drivers) and there can be detailed energy supply/demand linkages in the model outputs, allowing for optimization functionality in the Electricity Sector.
- LEAP can also model cost impacts and assessment of non-climate GHG impacts.

With respect to the project output scope, Dr. Boodlal expressed that LEAP ticked all the boxes in terms of the specific needs.

Functional Synopsis on Each Tool (PROSPECTS+)

Dr. Boodlal further related that

- the PROSPECTS+ is an excel based modelling tool, covering all sectors and with more detailed representation of the building and transport sector.
- He explained that though it can do some economic impact modelling, it does not represent cost of mitigation actions, nor can it be used for optimization functionality within the electrical sector.
- There are “plug in” tools that works with PROSPECTS+ to perform more detailed SDG and air pollution analysis for the electrical sector

Modelling Tool Selection

Finally, Dr. Boodlal summed up the modelling tools that will be used and why they were chosen. They are listed as follows:

- Based on the evolving project output scope, the LEAP tool was selected as the most suitable for this project, having the capability to perform all the required functionality
- For comparing and contrasting (and possibly validation), the GACMO tool was also selected, mainly because it appeared to have a simpler format than PROSPECTS + and could do the costing aspects

Examples of Some Useful Outputs (Not Actual Results) (GACMO)

Dr. Boodlal continued by presenting a pictorial output of what these tools can provide. The GACMO model provides a cost abatement curve (***Figure 3***), where the rectangles represent each technology or action, the width of the rectangle is the reduction potential and the height represents the cost.

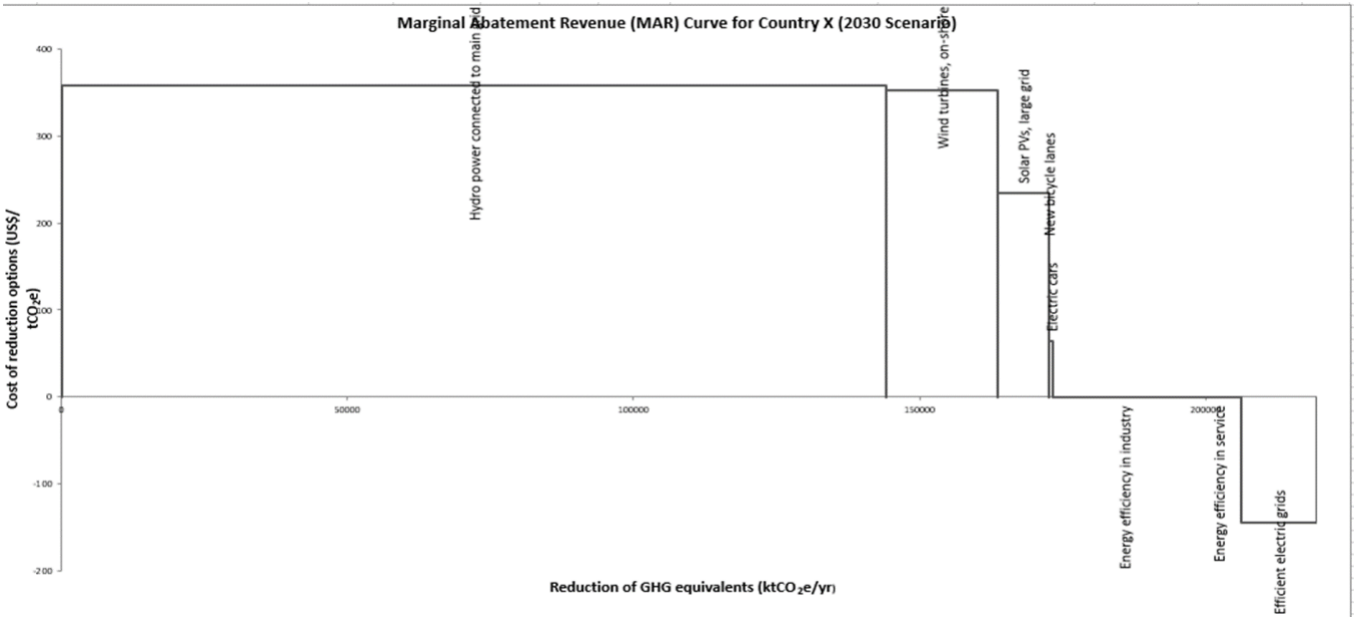

Figure 3 represents Outputs of GACMO

Examples of Some Useful Baseline Information (Not Actual Results) (LEAP)

He continued explaining pictorial representation of baseline scenario using the LEAP tool ***(Figure 4).*** The graphs on the left shows the energy consumption of oil equivalent for different demand sector, projected up to 2030. The sectors are colour coded and show the projected changes over time in each. The graph on the right represents different energy moods; energy types being phased out or used less over time as well as those expected to increase.

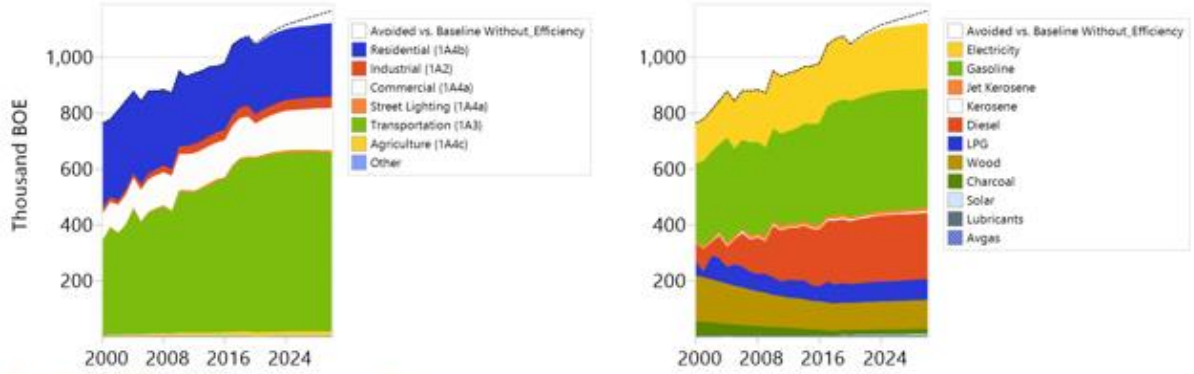

Figure 4 showing sample baseline scenario using LEAP

Examples of Some Useful Mitigation Information (NOT Actual Results) (LEAP)

Dr. Boodlal explained the sample bar chart showing mitigation information into the future up until 2050 (***Figure 5).*** It depicts colour coded demand sectors and the actual emissions for selected years up to 2050. He continued that the reduction can be seen for each sector and how they change over time.

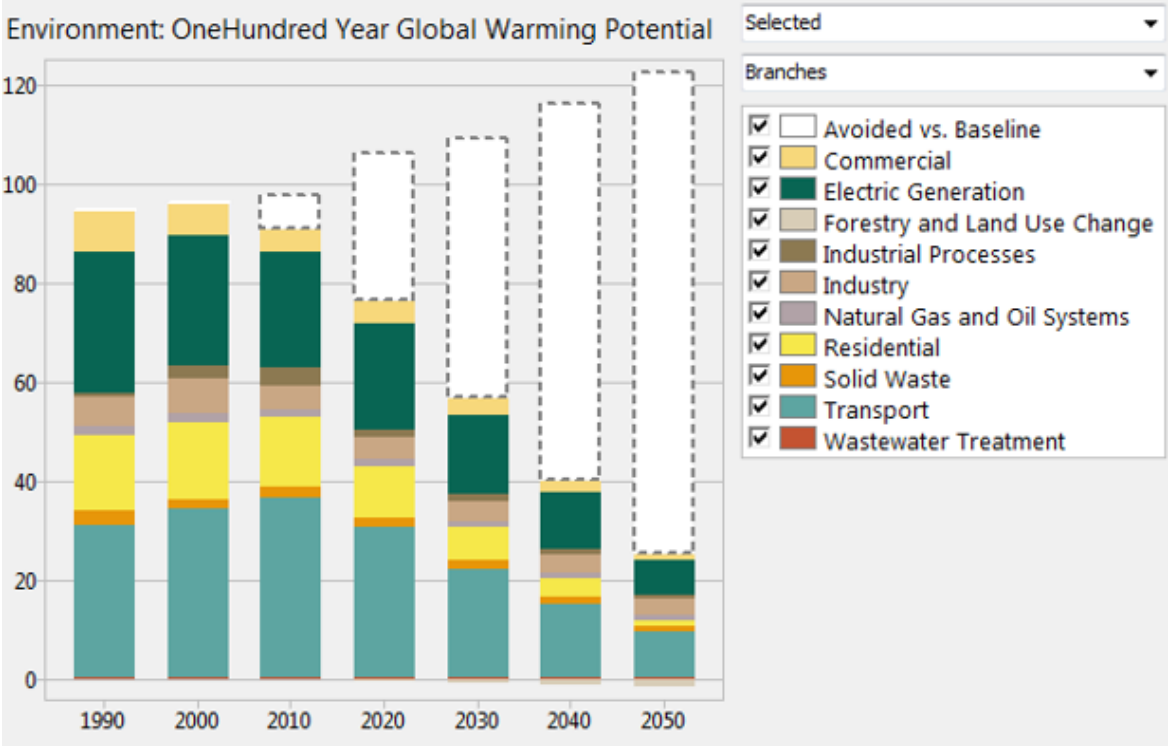

Figure 5 showing sample Mitigation Scenario using LEAP.

Examples of Some Questions that can be Answered Ex-Ante

To give an idea of some of the questions that the models can answer before using, Dr. Boodlal create a checklist and emphasized that it is certainly not limited to current questions only. As the work progresses, more can be added. It is only used as an indication for possible future outcomes.

- How much GHG emissions can be mitigated by phasing out all ICE vehicles with electric vehicles by 2040 (25% penetration every 5 years)?
- How much GHG emissions can be mitigated by improving energy efficiency in lighting by 50% with a 100% penetration by 2030?
- How much GHG emissions can be mitigated by improving energy efficiency in AC by 15% with a 30% penetration by 2030?
- How much GHG emissions can be sequestrated through the reforestation of 100 hectares of degraded areas by 2030?
- What would be the abatement cost for these actions?
- What are some of the lowest cost pathways to achieve overall NDC targets?

Examples of Metadata that would be Needed to Build and Update the model

Dr. Boodlal briefly gave an overview of the data that will be necessary for the models. They are listed as follows:

- Energy Balance Data (2000 – most recent)
- Demographic Data (Population etc)
- Macroeconomic Data (GDP etc)
- GHG emissions for key sectors (Inventory)
- GHG emission factors
- Non-energy sector sources and sinks (NET emissions current, historical and projections)
- Energy Price Data
- Electricity Generation Data
- Overall Demand and Projections for different Demand Sectors (Transport, Household etc.)

Next Steps and Closing

Dr. Boodlal detailed the next immediate step for the CCMRVH Team, which is to prepare and finalize the project output scope report. He explained that the feedback received from the workshop will be included in its development. This will be followed by Introductory training for LEAP and GACMO. The training is:

- Tentatively Scheduled for Week of 11th -17th March, 2021.
- Managed using GHGMI Learning Management System

He further explained the schedule for the training session as follows:

- General Mitigation Assessment Training on 11th March,2021.
- One day GACMO Training on 12th March,2021.
- Two days LEAP Training on 15th and 17th March, 2021.

Oraine Nurse closed the workshop by detailing the next steps for the ICAT team, which involved creating a participant list, based on the persons selected by the relevant entities. The participant's list would be divided into two groups; one designed for persons to have the general knowledge of how the model works and the other designed to deal with the more technical handling of the models. He further expressed and alerted stakeholders that there would be more bilateral outreach, and thanked everyone for being a part of the workshop.

Annex 1- Agenda

Initiative for Climate Action Transparency: Building National Mitigation Scenario Modelling Capabilities in Antigua & Barbuda

Stakeholder Engagement Workshop
Objective: *To update stakeholders on selected models and project direction, and stakeholder capacity building*

Date: Friday 12th February 2021
Time: 10:00a.m. – 11:40a.m.
Location: Microsoft Teams Virtual Meeting
Event Type: Stakeholder Workshop
Meeting Facilitator: Anik Jarvis, ICAT National Coordinating Team

Time	Agenda Items
10:00 – 10:10	**Welcome and Introductions**
10:10 – 10:20	**ICAT Project Overview –** ICAT National Coordinating Team: Oraine Nurse
Project Output Scope CCMRVH Consultants: Dr. Donnie Boodlal & Benise Joseph	
10:20 – 10:50	**Formal Bilateral Outreach and Proposed Project Output Scope –** Dr. Donnie Boodlal • Formal Bilateral Outreach Completed • Mitigation Assessments and UNFCCC Reporting • An Overview of Stakeholder's Feedback (thus far) • Proposed Project Output Scope
10:50 – 11:15	**Mentimeter Discussion –** Benise Joseph
11:15 – 11:35	**Modelling Tools: *Why these, What to expect and How you are needed* –** Dr. Donnie Boodlal • A Functional Overview of Modelling tools – Tool Selection • A look at what the selected tools can do - Outputs & Application • Typical Data Sets Required
11:35 – 11:40	**Workshop Evaluation, Next Steps & Closing**