Modelling and Projections Programme (MPP)

Caribbean Cooperative MRV HUB
Measurement Reporting & Verification

2023 GHG Modelling Tools Webinar Series

24th May to 28th June, 2023

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag

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GLOBAL SUPPORT PROGRAMME

The CCMRVH is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag, with additional resources and technical support provided by the UNDP/UNEP Global Support Programme.

TOPICS

- Mitigation Potential in the Caribbean
- Assessment of the NDC efforts in the MRV Hub Member Countries
- Tools available to advance mitigation in the region & the Future of Mitigation in the Region

Mitigation Potential in the Caribbean

MITIGATION POTENTIAL

in

THE CARIBBEAN

Caribbean Cooperative MRV HUB
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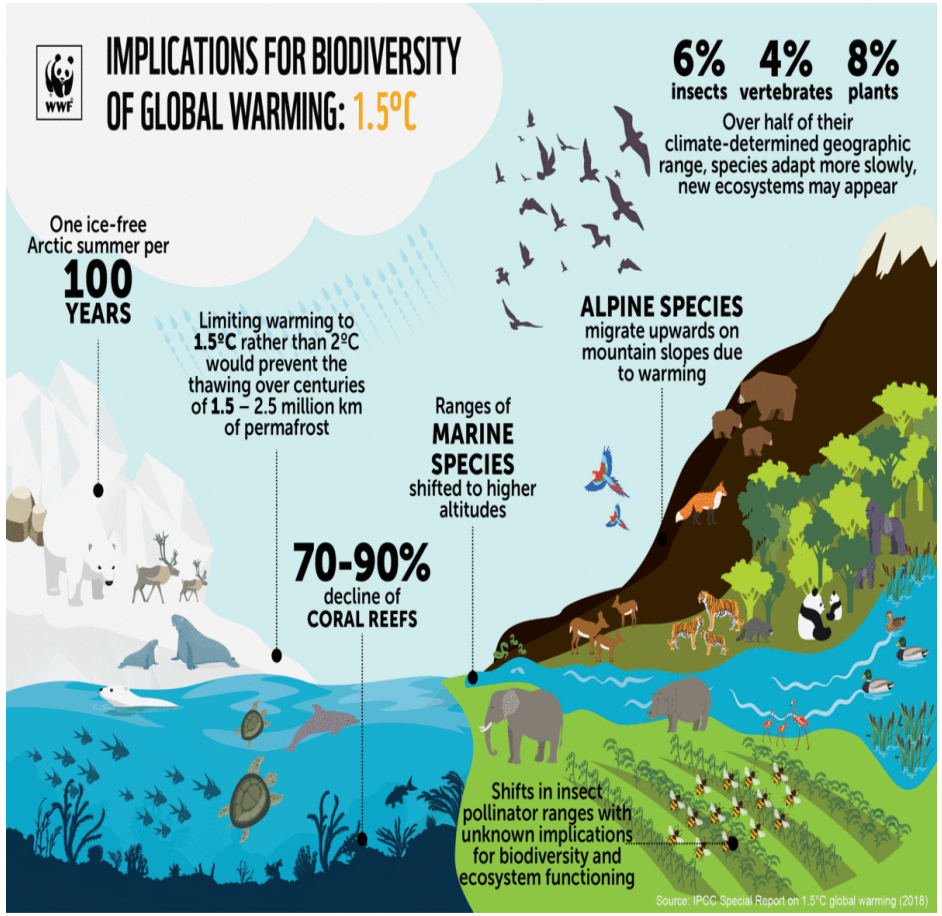
MPP
Mitigation Modelling and Projections Program

What is Mitigation?

- **Mitigation – reducing climate change – involves reducing the flow of heat-trapping greenhouse gases into the atmosphere**, either by reducing sources of these gases (for example, the burning of fossil fuels for electricity, heat or transport) or enhancing the "sinks" that accumulate and store these gases (such as the oceans, forests and soil).



basic-concept.com

What is a GHG Emissions Inventory?

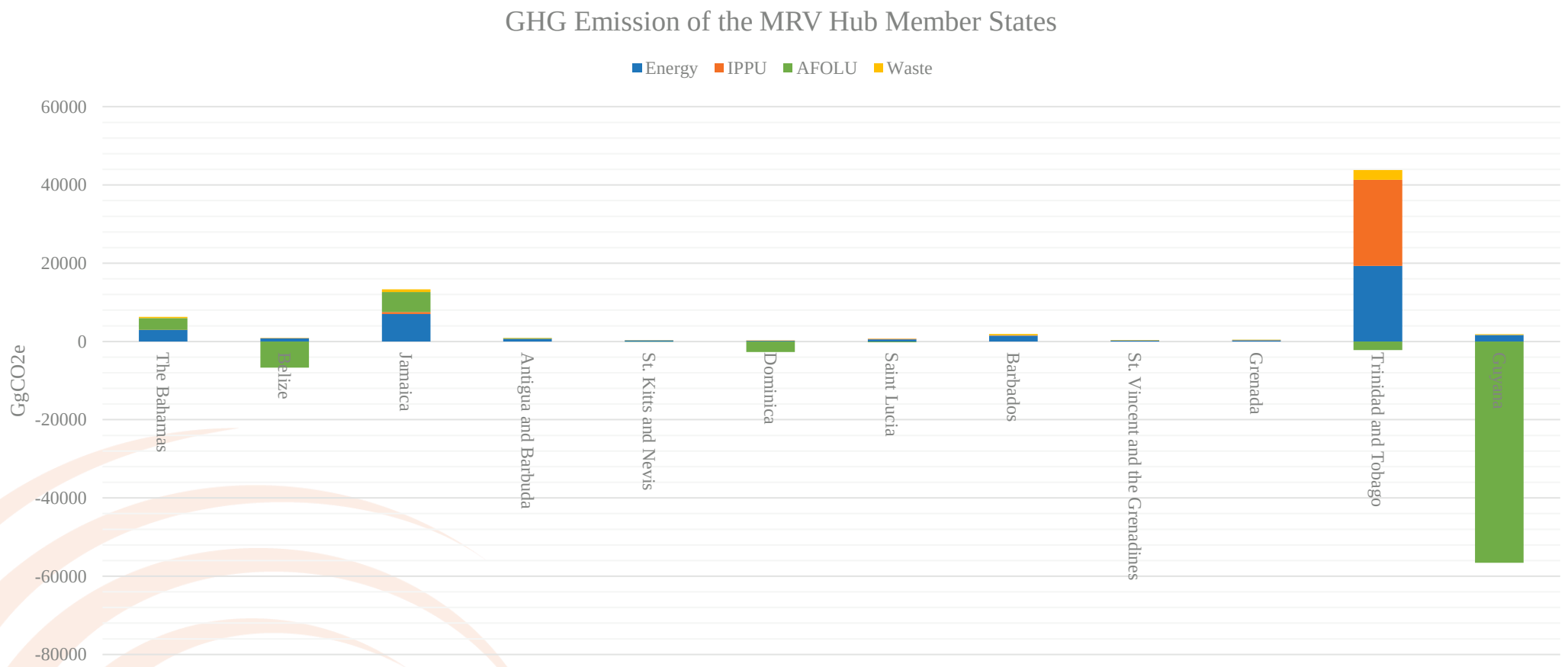
A **GHG emission inventory** attempts to quantify and organize information about GHG emissions based on common standards and protocols, and to attribute emissions correctly to a facility, company, nation, or other entity.

Why do we care about GHG inventories?
You can't manage what you don't measure

Policies depend on reliable emissions data

- What are the **main drivers of your emissions and removals**?
- What are the **past trends** of emissions and removals?
- What are the **effects of existing and planned policies** and measures (including policies that may aggravate emissions)?
- What information is lacking **to support political decisions**?
- Does the GHG inventory fulfil specific **reporting** requirements
- What activities, industries, companies, or policies have **been responsible** for significant increases or decreases in GHG emissions or removals?
- How to **quantify and get credit** for activities that reduce emissions or sequester carbon?
- What are the priorities for **research** and measurement?

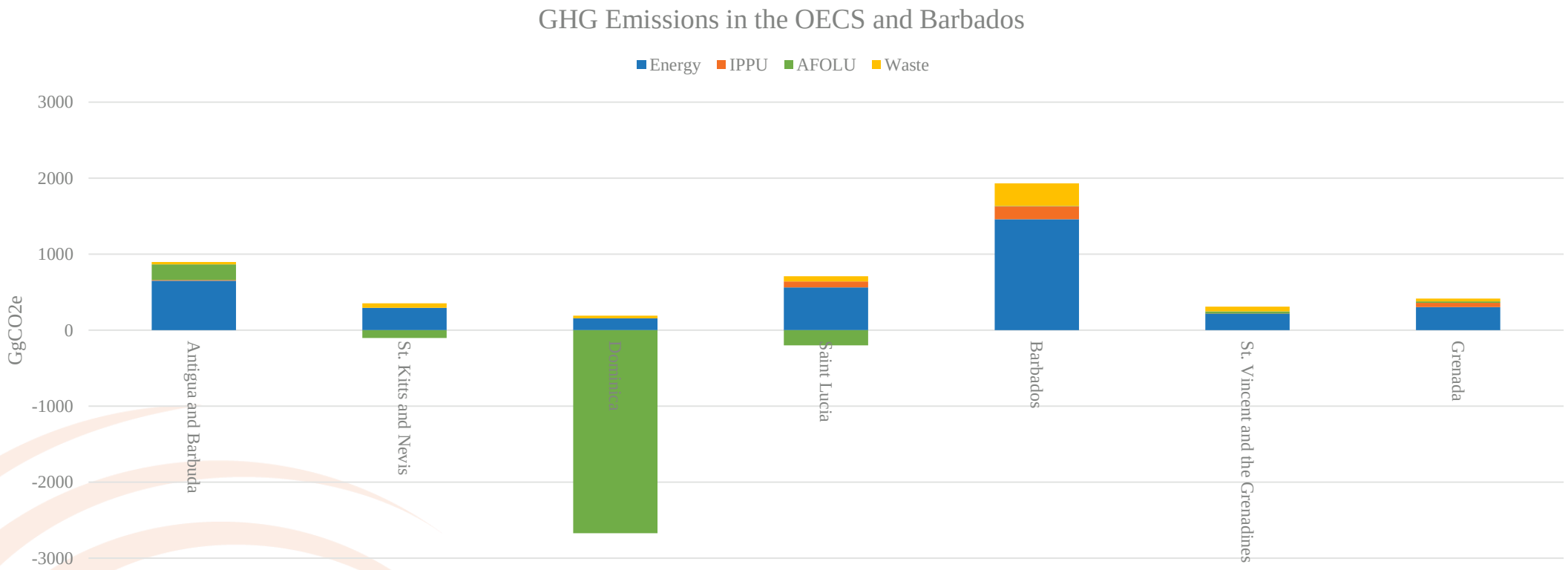
GHG Emissions in the Caribbean



Inventory years are shown by country:
Bah (2018), BLZ (2017), Jam (2012), A&B (2015), SKN (2018), Dom (2017), SLU (2018), Bar (2010), SVG (2004), GRD (2014), T&T (2018), GUY (2004)

Data Source:
Bah (2022-BUR1), BLZ (2020-BUR1), Jam (2016-BUR1), A&B (2020-BUR1), SKN (2023-BUR1), Dom (2020 –NC3), SLU (2021-BUR1), Bar (2018-NC2), SVG (2015-NC2), GRD (2017-NC2), T&T (2021-BUR1), GUY (2012-NC2)

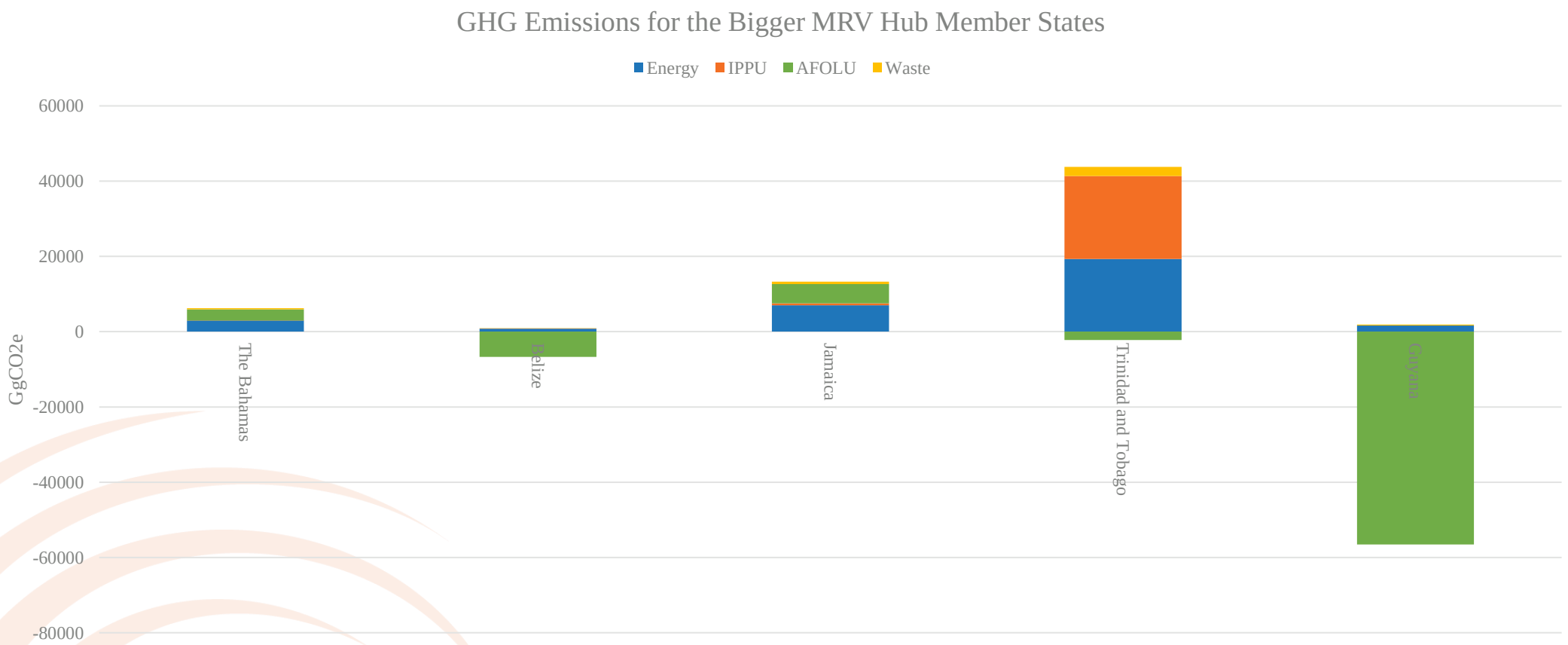
GHG Emissions in the OECS and Barbados



Inventory years are shown by country:
A&B (2015), SKN (2018), Dom (2017), SLU (2018), Bar (2010), SVG (2004), GRD (2014)

Data Source:
A&B (2020-BUR1), SKN (2023-BUR1), Dom (2020 –NC3), SLU (2021-BUR1), Bar (2018-NC2), SVG (2015-NC2), GRD (2017-NC2),

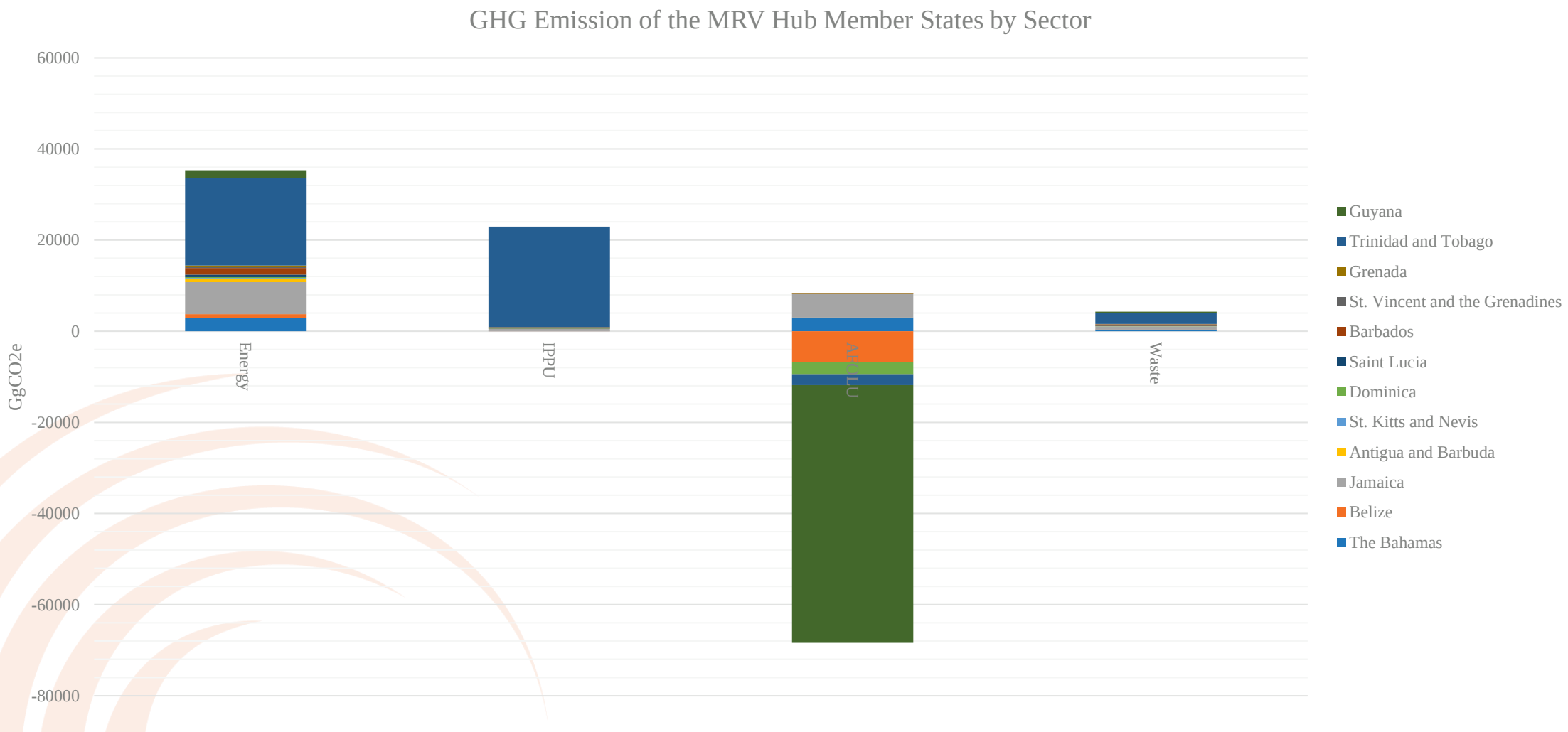
GHG Emissions in the wider Caribbean



Inventory years are shown by country:
Bah (2018), BLZ (2017), Jam (2012, T&T (2018), GUY (2004)

Data Source:
Bah (2022-BUR1), BLZ (2020-BUR1), Jam (2016-BUR1), T&T (2021-BUR1), GUY (2012-NC2)

GHG Emissions in the Caribbean by Sector



Mitigation Potential Overview in the Region

- Knowing the GHG emissions helps us understand what the mitigation potential of the region and individual countries

- It is also important that countries update their GHG emissions to help track their achievements. Some of the inventory data used in the analysis was taken from 2004 inventories.

- Some sectors were not estimated, and this does not give a true reflection of the emissions in the region and, therefore the mitigation potential.

Assessment of the NDC efforts in the MRV Hub Member Countries








CARIBBEAN Region
Nationally Determined Contributions (NDCs)
&
Mitigation Plans/Actions




Summary of NDC Targets

Country	Summary of Targets
Antigua and Barbuda	Achieve 86% renewable energy generation from local resources in the electricity sector by 2030 The transition from predominantly internal combustion engine (ICE) vehicles to electric vehicles (EV); Transport sector target is set to be achieved by 2040, however, continuous actions will be taken starting in 2025.
Bahamas	Economy-wide emission reduction by 30% compared to BAU by 2030 Increase renewables in electricity generation by 2030 by a minimum of 30% Electric and hybrid vehicles to represent 35% and 15% of total vehicle sales, respectively, by 2030
Barbados	Economy-wide reduction in GHG emissions of 44% to its business as usual (BAU) scenario by 2030 A conditional contribution for an emissions reduction in the electricity sector of 95% by 2030 An unconditional contribution for the electricity sector of an emissions reduction of 50% by 2030
Belize	The updated NDC of the country aims to avoid 5,647 KtCO2e of cumulative emissions by 2030. The targets include a 63% increase in GHG removal in the AFOLU sector, an increase in renewable energy projects, and actions to adapt to the impacts of climate change.
Dominica	The Government of Dominica has made a commitment to the progressive reduction of total GHG emissions at the following rates: 39% by 2025 and 45% by 2030 below 2014 levels. These overall targets do not include the LULUCF sector
Grenada	To reduce GHG emissions by 40% below 2010 levels

Summary of NDC Targets

Country	Summary of Targets
Guyana	Sustainable forest management. With the provision of adequate resources, Guyana can increase its share of renewable energy by 100% by the year 2025
Jamaica	25.4% reduction relative to business-as-usual emissions in 2030 without international support (unconditional) 28.5% reduction relative to business-as-usual emissions in 2030 conditional upon international support
SKN	This revised and strengthened NDC pledges a significantly more ambitious mitigation target of reducing economy-wide CO2 emissions by 61% by 2030, compared to the base year 2010, conditional upon adequate access to resources including climate finance as well as capacity building support.
Saint Lucia	7% or 37 GgCO2e Greenhouse Gas (GHG) emissions reduction in the energy sector relative to 2010 baseline, by 2030
SVG	Economy-wide reduction in gas (GHG) emissions of 22% compared to its business as usual (BAU) scenario by 2025
Trinidad and Tobago	30% reduction in GHG emissions by December 31, 2030, in the public transportation sector (BAU reference year 2013). Conditional GHG reduction to 15% (103,000,000 of CO2e) below BAU emission levels by December 31, 2030.

Antigua and Barbuda – Examples of Plans/Actions

- 100 MW of renewable energy generation capacity available to the grid
- 50 MW of renewable energy generation capacity owned by farmers who can sell electricity to off-takers
- 100 MW of renewable energy generation capacity owned by social investment entities
- 20 MW of wind-powered energy generation
- 100% renewable energy generation for all government operations
- 100% of fixtures and appliances in government buildings will be energy efficient
- Elimination of the fuel surcharge tax on electricity bills
- 100% of new vehicle sales to be electric vehicles by 2030

(*ANTIGUA AND BARBUDA UPDATED NATIONALLY DETERMINED CONTRIBUTION* 2021)

Bahamas- Examples of Plans/Actions

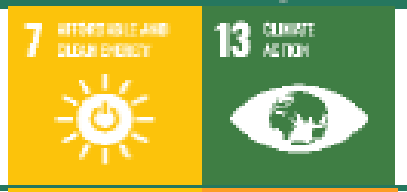
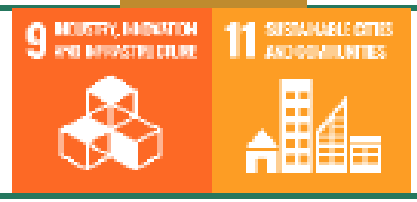
NDC target (2030)	Component	SDG Linkages
Reduce GHG emissions by 30%	Promoting energy efficiency, sustainable practices across sectors and enhancing carbon capture.	
30% renewables in the energy mix	Promoting renewable generation and setting up incentive mechanisms.	
Electric and hybrid vehicles represent 35% and 15% of total vehicle sales, respectively	Promoting the electrification of road transportation.	

Table 1. Updated NDC mitigation goals and Sustainable Development Goals (SDG) linkages.

(Government of the Commonwealth of The Bahamas , *The Bahamas Updated NDC*)

Barbados- Examples of Plans/Actions

- Updated conditional mitigation contribution for 2030 consists of:
  - 95% share of renewable energy in the electricity mix.
  - 100% electric or alternatively-fueled vehicles in the passenger fleet.
  - 20% increase in energy efficiency across all sectors as compared to BAU.
  - 29% decrease in industrial, commercial and residential fuel consumption as compared to BAU.
  - 20% decrease in waste emissions.

(*BARBADOS 2021 UPDATE OF THE FIRST NATIONALLY DETERMINED CONTRIBUTION*)

Belize - Examples of Plans/Actions

- Reduce GHG emissions and increase GHG removals related to land use change totaling 2,053 $ktCO_2e$ cumulative over the period from 2021 to 2030
- Enhance the capacity of the country's mangrove and seagrass ecosystems to act as a carbon sink by 2030, through increased protection of mangroves and by removing a cumulative total of 381 $ktCO_2e$ between 2021 and 2030 through mangrove restoration.
- Reduce methane emissions from livestock by 10% by 2030 and avoid emissions of at least 4.5 $ktCO_2e$ related to agriculturally driven land use change by 2025
- Avoid emissions from the power sector equivalent to 19 KtCO2e per year through system and consumption efficiency measures amounting to at least 100 GWh/year by 2030
- Avoid 44 $ktCO_2e$ in the national electricity supply by 2030 through the introduction of expanded capacity from renewable energy sources
- Improve waste management processes to avoid emissions of up to 18 $ktCO_2e$ per year by 2030, in line with the national waste management strategy

(*Belize Updated Nationally Determined contribution* August 2021)

Dominica - Examples of Plans/Actions

- Total GHG reduction of 45% below 2014 levels
  - Energy industry: 98.6%
  - Transport: 16.9%
  - Manufacturing and Construction: 8.8%
  - Commercial/Institutional …etc: 8.1%
  - Solid Waste: 78.6%
- 100% renewable energy usage by 2030
- Forest: 600Gg+ carbon sequestration annually 2020-2030
- Agroforestry: 50% increase in agroforestry farming
- Geothermal Resources: Export to Martinique and Guadeloupe

(*Dominica Updated Nationally Determined contribution* July 2022)

Grenada – Example of Plans/Actions

- Emissions reduction through a combination of renewable energy (10%) and energy efficiency measures (20%) by producing:
  - 20MW hours of electricity from renewable sources.
    - The renewable energy mix includes 10MW from solar, 15MW from geothermal, and 2MW from wind.
  - Energy efficiency measures include retrofitting all buildings (20% reduction), energy efficiency building codes for all building sectors (30% reduction), and implementation of energy efficiency in hotels (20% reduction).

(The Government of Grenada , *Grenada Second Nationally Determined Contribution* November 30, 2022)

Guyana – Example of Plans/Actions

- Guyana will seek to construct and/or promote the construction of small hydro systems at suitable locations such as Moco Moco, Kato and Tumatumari. Guyana will power all of the six newly established townships, starting with Bartica, using renewable energy sources.

- Legislation has been enacted to remove import duty and tax barriers for the importation of renewable energy equipment, compact fluorescent lamps and LED lamps to incentivize and motivate energy-efficient behaviour.

(The Government of Guyana, *GUYANA"S REVISED INTENDED NATIONALLY DETERMINED CONTRIBUTION*)

Jamaica – Example of Plans/Actions

- The country's first National Energy Policy 2009-2030 aims to address mitigation challenges by increasing energy conservation and efficiency, promoting renewable energy, and fuel diversification. The National Energy Policy aims to improve energy infrastructure, promote energy conservation and efficiency, and develop a comprehensive governance/regulatory framework.
- The energy sector is responsible for over 86% of carbon dioxide emissions released into the atmosphere, with the remainder coming from land use changes that remove trees and other vegetation.
- Under the Energy Policy, Jamaica aims to have 20% of its energy from renewable resources by 2030.

(*Jamaica Updated of Nationally Determined Contribution (NDC)* June 2022)

St. Kitts and Nevis - Example of Plans/Actions

- Switching to 100% renewable energy in electricity generation and increasing the share of electric vehicles in the vehicle fleet to at least 2%.
- 100% renewable energy through the following measures
  - 35.7 MW of utility-scale solar PV capacity for Saint Kitts
  - 6.6 MW of wind power capacity in Saint Kitts
  - 25 MW of geothermal power capacity (10 MW in Nevis and 15 MW in St. Kitts)
  - Improvement in transmission and distribution lines to reduce losses in both islands
  - Two solar PV plants of 0.75 MW each to supply two desalination plants
  - 5% reduction in the power demand by introducing Solar Water Heaters
- Additionally, St. Kitts and Nevis seeks financial and capacity-building support to develop the necessary charging infrastructure and training programs to enable swift decarbonization of the transport sector.

(*St. Kitts and Nevis Updated Nationally Determined Contribution* October 2021)

Saint Lucia – Examples of Plans/Actions

- Saint Lucia's NDC is mitigation-centric and the NDC's target is 7% Greenhouse Gas (GHG) emissions reduction in the energy sector relative to 2010, by 2030.
- Saint Lucia's target is a sector-wide emissions reductions target using 2010 as base, covering IPCC's energy (electricity generation and transportation) sector, and three gases: Carbon Dioxide, Methane, and Nitrous Oxide.
- The target is a continuation and expansion of efforts listed in the first NDC to meet the targets for 2025 and 2030. Saint Lucia has already begun to implement these targets.
- Saint Lucia does not have specific mitigation actions outlined in the updated NDC submission, but it is included in their implementation plan

(*Saint Lucia's Updated Nationally Determined Contribution* January 2021)

Saint Vincent and the Grenadines
Examples of Plans/Actions

- Renewable energy:
  - Development of proposed geothermal power plant (planned to be completed in 2018). Plant will generate ~50% of the national annual electricity consumption needs
  - Renovation of existing hydro power facilities to improve efficiency and generation capacity as well as enabling and encouraging the installation of small-scale photovoltaics (PV) in the private and public sectors.
- Energy efficiency
  - Achieve a 15% reduction in national electricity consumption compared to a BAU scenario by 2025. Planned measures in this sector include the retrofitting of street lighting nationally, a new building code and an energy labelling scheme for appliances.
- Transport:
  - New policies to reduce the import duty paid on low emission vehicles are in the process of being introduced to encourage their use. It is estimated that this will result in avoided emissions of approximately 10% over the next 10 years.
- Land Use, Land Use Change and Forestry (LULUCF):
  - Development of GHG sinks though reforestation, afforestation reduced deforestation and reduced forest degradation.

(*Saint Vincent and the Grenadines Nationally Determined Contributions* November 18, 2015)

Trinidad and Tobago - Examples of Plans/Actions

- Unconditional: 30% reduction in GHG emissions by December 31, 2030 in the public transport sector compared to BAU
- Condition: 15% reduction in GHG emissions by December 31, 2030 (excluding the forest, land use and natural resources)
- Estimated cost is USD 2 billion

(*Trinidad and Tobago Nationally Determined Contributions* February 22, 2018)

NDC Areas Covered

Electricity Generation (Renewable Energy) - (12 countries)
Transport (8 countries)
Energy Efficiency (11 countries)
Forestry (3 countries)
Agriculture (2 countries)
IPPU (1 country)
Waste (3 countries)

Tools available to advance mitigation in the region
&
the Future of Mitigation in the region

UNFCCC Reporting Requirements

- All parties are required to submit their first BTR by December 31st, 2024 with SIDS and LDC allowed to submit at their discretion
- All countries are required to report progress made in implementing and achieving their NDC targets. (This shall be in narrative and common tabular format (CTF))
- Countries are expected to submit estimates of expected and achieved GHG emissions reductions (Flexibility is allowed for developing countries)
- Countries are expected to report on projections of GHG emissions and removals (at least 15 years beyond the ending year in zero or five) (flexibility provisions for developing countries to extend projections to the endpoint of NDC)

Tools Available to Advance Mitigation in the region

- GACMO
- LEAP
- GUIDANCE DOCUMENTS
- FAO EX-ACT TOOL
- PyPSA

Future of Mitigation in the region

- Countries are expected to report on their NDCs every two years in the BTRs
- Countries are expected to provide projections for emissions and emission reductions
- Countries need to have indicators for their NDCs and to be able to track progress
- It is anticipated that using tools for projections will become vital in the coming years for BTRs.

Thank You

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