



## ANTIGUA AND BARBUDA

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### INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

Communicated to the UNFCCC on 15<sup>th</sup> October, 2015

#### **Introduction**

The Government of Antigua and Barbuda is committed to the successful conclusion of negotiations under the Ad-Hoc Working Group on the Durban Platform for Enhanced Action (ADP) in order to adopt, at COP21 in Paris, a new legally binding agreement under the United Nations Framework Convention on Climate Change (UNFCCC) appropriate to all Parties, which will come into effect and be implemented from 2020 onwards.

Antigua and Barbuda hereby communicates its Intended Nationally Determined Contribution (INDC), in accordance with the relevant paragraphs of Decisions 1/CP.19 and 1/CP.20, towards achieving the objective of the Convention to stabilize greenhouse gas (GHG) concentrations to “prevent dangerous anthropogenic interference with the climate system” (Article 2), and towards the Convention’s commitment for all Parties to take “measures to facilitate adequate adaptation to climate change” (Article 4).

As agreed in Decision 1 CP/20 para 11, “Small island developing states may communicate information on strategies, plans and actions for low greenhouse gas emission development reflecting their special circumstances in the context of intended nationally determined contributions.” Mitigation and adaptation targets in this INDC are presented in an up-front format to facilitate clarity and transparency, and are a mix of conditional and unconditional contributions, contingent upon receiving international support for technology transfer, capacity-building and financial resources.

Antigua and Barbuda reserves the right to revise this INDC prior to finalization and/or ratification under a new global climate agreement.

## Intended Nationally Determined Contribution (INDC)

### **Conditional** Adaptation Targets

1. By 2025, increase seawater desalination capacity by 50% above 2015 levels.
2. By 2030, all buildings are improved and prepared for extreme climate events, including drought, flooding and hurricanes.
3. By 2030, 100% of electricity demand in the water sector<sup>1</sup> and other essential services (including health, food storage and emergency services) will be met through off-grid renewable sources.
4. By 2030, all waterways are protected to reduce the risks of flooding and health impacts.
5. By 2030, an affordable insurance scheme is available for farmers, fishers, and residential and business owners to cope with losses resulting from climate variability.

### **Conditional** Mitigation Targets

1. By 2020, establish **efficiency standards** for the importation of all vehicles and appliances.
2. By 2020, finalize the technical studies with the intention to construct and **operationalize a waste to energy (WTE) plant by 2025.**<sup>2</sup>
3. 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.<sup>3</sup>
4. By 2030, **all remaining wetlands and watershed areas with carbon sequestration potential are protected as carbon sinks.**

### **Unconditional** Targets

1. Enhance the established enabling legal, policy and institutional environment for a low carbon emission development pathway to achieve poverty reduction and sustainable development.
2. By 2020, update the Building Code to meet projected impacts of climate change.

### *Support for Implementation*

The conditional adaptation and mitigation targets presented in this INDC are contingent upon Antigua and Barbuda receiving international support for capacity building, technology transfer

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1 The water sector includes water generation (seawater desalination), distribution and usage, to ensure water delivery when grid electricity may be interrupted. Based on an informal assessment, water distribution and usage is equal to approximately 15% of GHG emissions in the electricity sector.

2 This waste to energy target is not considered part of the 50 MW renewable energy target.

3 This target includes distributive renewable energy capacity to be used as backup energy by the commercial sector and some residences. The assumption is that the commercial sector has full backup capacity of approx. 20 MW to continue business when electricity via the grid may be interrupted. Backup electricity generation is currently fossil fuel-based.

and financial resources, including through the Green Climate Fund (GCF), the Global Environment Facility (GEF), the Adaptation Fund and multilateral agencies and bilateral agreements. The cost of implementing the adaptation targets is estimated at approximately \$20M USD per year for the next ten years, and the cost of implementing the mitigation targets is estimated at approximately \$220M USD, however these figures require further analysis.

National contributions include establishing an enabling legal, policy and institutional environment to facilitate an efficient and effective transfer of resources to support implementation and achievement of the INDC targets. This enabling environment includes enactment of the Renewable Energy Act of 2015 and the Environmental Protection and Management Act (EPMA) of 2015, in addition to policies in energy and the environment such as the National Energy Policy and the Sustainable Energy Action Plan. National efforts have contributed to an enabling financing environment through the Sustainable Island Resource Framework Fund (SIRF Fund), which was established under national environmental law. The Fund's executing agency, the Department of Environment, has achieved accreditation to the Adaptation Fund as a National Implementing Entity, and the Department is seeking direct access to the GCF.

#### INFORMATION TO FACILITATE CLARITY AND TRANSPARENCY

Parameter		Information
Period of implementation		Pre 2020 and 2020 – 2030
Type of commitment		We recognize that contributions from developed countries may be absolute economy-wide emission reduction targets relative to a base year, and that contributions from developing countries may be policies, measures and actions departing from business as usual. As a developing country, a small island developing state, and one of the lowest emitters in the world, Antigua and Barbuda presents conditional and unconditional policies, measures and actions (non-GHG target).
Reference point		Greenhouse Gas Emissions and Removals (Gg) for 2006
Scope and coverage	Emissions impact	Contributions will reduce GHG emissions in the energy sector, reduce dependence on fossil fuels, reduce the cost of energy and help alleviate poverty through increasing access to affordable and



		sustainable energy.
	Sectors	Sectors addressed in the adaptation and mitigation targets include: Energy, Health, Tourism, Agriculture, Waste, Water, Transportation, Forestry and Land Use Change.
	Greenhouse Gases (GHGs)	The national GHG inventory covers Carbon Dioxide (CO <sub>2</sub> ), Methane (CH <sub>4</sub> ), Nitrous Oxide (N <sub>2</sub> O), and Hydrofluorocarbons (HFC).
	Geographical boundaries	Entire country
Intention to use market-based mechanisms to meet target		Antigua and Barbuda considers the establishment of an international market mechanism as an important complementary option to reduce total costs associated with limiting GHG emissions and to assist global efforts limiting temperature to 1.5 degrees Celsius above pre-industrial levels. Antigua and Barbuda acknowledges the potential for a renewed and reformed Clean Development Mechanism to fulfill this roll through its existing structure. The final mechanism should be a robust system that guarantees transparency and environmental integrity, and delivers real, permanent and verified emissions reductions and ensures that double counting is avoided.
<b>Planning process</b>		
<p>This initial draft INDC was developed through a Cabinet mandate, where the Cabinet of Antigua and Barbuda also reviewed the adaptation and mitigation targets. The Technical Advisory Committee (TAC), was the primary drafting and review committee in the development of this initial INDC. The TAC is an inter-agency, multi-stakeholder advisory committee that includes fifteen government agencies, three NGOs and community interest groups, and one private sector coalition representative.</p> <p>Additional consultations were arranged with public, private, and civil society stakeholders, through meetings, workshops, public awareness and online publication.</p> <p>Antigua and Barbuda recognizes the importance of Principle 10 of the Rio Declaration on transparency, access and accountability in environmental matters through participation of all concerned citizens, at the relevant levels, as well as to involve the community by encouraging public awareness and participation by making information readily available.</p>		

Antigua and Barbuda's INDC is a working document and will be updated periodically, as appropriate. This initial draft INDC will be supported by a technical road map and additional technical assessments to facilitate the drafting of policies, regulations, and standards for implementation.

#### **Assumptions and Methodological Approaches**

The full implementation of Antigua and Barbuda's INDC is made on the assumption of an ambitious and equitable multilateral agreement being reached among Parties that provides the means of implementation to enable Antigua and Barbuda to access international support through climate finance, and an agreement that stimulates investments, technology transfer and capacity building.

The methodologies used to estimate GHG emissions in relevant sectors correspond to the 2006 IPCC Guidance for Conducting National Greenhouse Gas Inventories and assume Global Warming Potential (GWP) values for a residence period in the atmosphere of 100 years pertaining to the Second Assessment report of the IPCC.

#### **Consideration on Fairness and Ambition**

Antigua and Barbuda's INDC is fair, ambitious, and science-based, and is therefore a responsible contribution toward the global efforts of meeting the objectives of the UNFCCC to limit the average temperature rise to 1.5 degrees Celsius above pre-industrial levels, and to enable and support the implementation of adaptation actions aimed at reducing vulnerability and building resilience in vulnerable countries.

The ambitious adaptation and mitigation targets presented in this INDC represent a national commitment towards addressing the global climate change challenge. Antigua and Barbuda's emissions are negligible in a global context (less than 0.002%), and as a small island developing state (SIDS) the country is highly vulnerable to climate trends and impacts. Antigua and Barbuda aspires to increase national resilience to climate change through implementing integrated mitigation and adaptation actions.

Antigua and Barbuda reaffirms its commitment to the AOSIS position that, "Research clearly shows that unless we act immediately, the opportunity to keep global warming below the crucial 1.5 degree Celsius threshold could be irrevocably lost." The country believes in the principle of common but differentiated responsibilities and respective capabilities (CBDR) to address the global climate challenge.

## ACCOMPANYING INFORMATION ON ANTIGUA AND BARBUDA'S INDC

### General Information

Antigua and Barbuda is a small island developing state (SIDS) in the Caribbean Sea with a population of 90,000, of which 1,200 people reside in Barbuda. The country's economy is heavily dependent on natural resources, low-lying coastal zones, and favorable climate conditions to support the tourism sector, which accounts for about 80% of output gross domestic product (GDP), about 70% of direct and indirect employment and 85% of foreign exchange earnings. Antigua and Barbuda is exposed economically, environmentally and socially to projected climate change impacts.<sup>4</sup>

Climate models for the Caribbean highlight the need for downscaled climate data. Temperature projections from a Regional Climate Model (RCM) indicate more rapid increases in temperatures over Antigua and Barbuda compared to the Global Climate Model (GCM), as the improved spatial resolution in the RCM allows the land mass of the larger Caribbean islands to be represented, whilst the region is represented only by 'ocean' grid boxes at GCM resolution. RCM projections indicate increases of 2.4°C to 3.2°C in mean annual temperatures by the 2080s.<sup>5</sup> Analysis of climate change for the island also projects accelerated coastal erosion and inundation, lower average annual rainfall, increased rainfall intensity causing flooding and a likely increase in tropical storm intensity.

### Accompanying Information on Adaptation Actions

Antigua and Barbuda's development strategy is guided by a national physical development plan, a requirement under the Physical Planning Act of 2003, and is periodically updated. In 2012, Cabinet approved the Sustainable Island Resource Management and Zoning Plan (SIRMZP) to serve as the updated national physical development plan, which presents a forward-looking strategic, national spatial development framework that addresses current development issues, and provides a platform for feasible private and public sector development initiatives, reflecting local cultural values and aspirations over the next twenty years. Complementing the SIRMZP strategy, the adaptation targets presented in this INDC are incremental efforts to the national physical development plan as the targets elevate ambition beyond development, to build resilience through adaptation interventions in preparation for projected climate impacts.

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4 The CARIBSAVE Partnership, 2015. *Draft Vulnerability Impact and Adaptation Analysis in the Caribbean (VIAAC): National Vulnerability Analysis for Antigua and Barbuda*. Prepared with funding from UNEP-ROLAC.

5 The CARIBSAVE Partnership, 2012. *The CARIBSAVE Climate Change Risk Atlas (CCCRA): Climate Change Risk Profile for Antigua and Barbuda*. Prepared with funding from DFID and AusAID, p. 14.

Since the year 2001, Antigua and Barbuda has been up to date with its commitments to report to the UNFCCC and is now in the process of preparing its Third National Communication to the UNFCCC, to be presented by the end of 2015. Antigua and Barbuda has presented two National Communications, the first in 2001 and the second in 2011, which highlight climate change present and future impacts. The National Communications elaborate in detail the impact that climate change will have on weather- and climate-sensitive sectors. Antigua and Barbuda is currently developing its biennial update report (BUR), which will be submitted to the UNFCCC by the end of 2016.

Drought is a major concern for the country. Historically, the water sector in Antigua and Barbuda has been vulnerable to shortages as a result of droughts every 5 to 10 years coupled with contamination from saltwater intrusion that threatens groundwater supplies. Some wells have already been capped to address the issue of saltwater intrusion.<sup>6</sup>

Climate impacts will exacerbate freshwater scarcity. Antigua and Barbuda lie in a zone that is expected to receive 30-50% less average annual rainfall by 2090 compared to late 20<sup>th</sup> century norms.<sup>7</sup> In the Caribbean, sea level rise has been observed at between 1.5 and 3 mm per year, which will increasingly put inland freshwater resources at risk of saline intrusion.

Adaptation in the water sector is of national priority. Desalination reliance has already grown to account for 60% of national water supply, and this is the most viable option for enhancing freshwater resources.<sup>8</sup> During times of drought, desalination can account for up to 90% of freshwater supply. Antigua and Barbuda have the goal to, **by 2025, increase seawater desalination capacity by 50% above 2015 levels**, from approximately 5.4 million to over 8 million US gallons per day (GPD) to counteract freshwater scarcity in Antigua and Barbuda.

Given that desalination is the primary adaptation solution to Antigua and Barbuda's freshwater challenges, and that its ability to meet demand is contingent on a stable and uninterrupted energy supply, implementing resilience in energy systems for water resources is a critical adaptation measure. Off-grid renewable energy resources can enhance resilience in the water sector. **By 2030, 100% of electricity demand in the water sector and other essential services (including health, food storage and emergency services) will be met through off-grid renewable sources** to enhance resilience to drought and hurricanes.

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6 The CARIBSAVE Partnership, 2012. *Climate Change Risk Profile for Antigua and Barbuda*, p. 36.; Environment Solutions Limited (ESL), 2014. *National Adaptation Strategy and Action Plan to Address Climate Change in the Water Sector in Antigua and Barbuda: Final Report*. An initiative of the ACP Group of States funded by the EU, November 30: p. 11.

7 The CARIBSAVE Partnership, 2015. *Draft National Vulnerability Analysis for Antigua and Barbuda*, p. 9.

8 ESL, 2014. *National Adaptation Strategy and Action Plan*, p. 174.

The need for adaptation in the water sector is not limited to freshwater supply. In recent years, the impact of floods in Antigua and Barbuda have become particularly acute, in part due to climate variability affecting the frequency and severity of storms and rainfall extremes, and to development that has increased impervious surface cover and constricted drainage.<sup>9</sup> The health sector is exposed to climate impacts through vector borne diseases and the spread of water-borne illnesses, where trends suggest increases in Antigua and Barbuda.<sup>10</sup> **By 2030, all waterways will be protected to reduce the risks of flooding and health impacts.**

Climate models projecting hurricane trends have generally determined that there will be an increase in intensity, if not frequency, of hurricanes in the Atlantic and Caribbean.<sup>11</sup> As such, hurricanes will pose an increasing threat to Antigua and Barbuda's economy. Over 15 years, between 1995 and 2010, six hurricanes resulted in economic losses and damages on the twin island state totaling US \$335 million (Hurricane Luis in 1995, Hurricane Georges in 1998, Hurricanes Jose and Lenny in 1999, Hurricane Omar in 2008, and Hurricane Earl in 2010).<sup>12</sup> Physical infrastructure in Antigua and Barbuda must be adapted to the dynamic threats of water scarcity, heavy rainfall events, and more intense storms and hurricanes. **By 2030, all buildings will be improved and prepared for extreme climate events, including drought, flooding and hurricanes.**

Physical adaptation measures will not always be enough to prevent significant loss and damage to the infrastructure and economy of Antigua and Barbuda. As a coastal economy, one-meter sea level rise (SLR) would impact 10% of major tourism resorts, all seaports, and 2% of major road networks in Antigua and Barbuda. The fisheries sector sustains significant losses during hurricanes, and will be negatively impacted by ocean acidification, SLR, and increasing sea surface temperatures. The recent annual influx of Sargassum seaweed to Antigua and Barbuda's windward shores, which may be a result of climatic factors, is an unanticipated slow onset event with significant economic repercussions in tourism and fisheries. The agricultural sector is also particularly vulnerable to climate impacts. A drought in 2010 resulted in an overall loss of crops by 15%, with some crops sustaining losses up to 50%, while later that year excessive rain incurred losses to the crop sector totaling US \$1 million.<sup>13</sup> A loss and damage mechanism is integral to building resilience to climate change in Antigua and Barbuda. **By 2030, an affordable insurance scheme will be available for farmers, fishers, and residential and business owners to cope with losses resulting from climate variability.**

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9 UN-HABITAT, 2011. *Antigua and Barbuda: National Urban Profile*, p. 23.

10 The CARIBSAVE Partnership, 2012. *Climate Change Risk Profile for Antigua and Barbuda*, p. 189.

11 *Ibid*, p. 28.

12 The CARIBSAVE Partnership, 2015. *National Vulnerability Analysis for Antigua and Barbuda*, p. 44.

13 The CARIBSAVE Partnership, 2012. *Climate Change Risk Profile for Antigua and Barbuda*, p. xxv.



## Accompanying Information on Mitigation Actions

Without any known fossil fuel resources, Antigua and Barbuda relies almost exclusively on imported fossil fuels for energy: heavy fuel oil in electricity generation; gasoline and diesel in transport; and liquefied petroleum gas (LPG) for cooking. This has resulted in relatively high emissions and extremely high fuel costs. In 2006, Antigua and Barbuda's national emissions totaled 945.5 Gg CO<sub>2</sub>, of which 92% were derived from fuel combustion in the energy sector.<sup>14</sup> In addition, the cost of fossil fuel imports, valued at US \$165.4 million in 2013, or equivalent to 13.7% of the country's GDP, is a financial burden on the country's economy. The cost of electricity has risen to over US \$0.40 per kWh,<sup>15</sup> and consumers in Antigua and Barbuda pay among the highest electricity prices in the world. High electricity rates inhibit adaptation strategies, such as energy intensive seawater desalination; the provision of essential services; small businesses and low- and middle-income households; and economic growth.

However, in recent years, Antigua and Barbuda has made important strides in its sustainable energy policy. A National Energy Policy (NEP) was approved in November 2011, serving as the main policy for renewable energy (RE) and energy efficiency (EE) development. The NEP sets out the national approach to achieving its vision that, "By 2030 Antigua and Barbuda will meet the needs of the present generation while safeguarding the environment and enabling future generations to meet their own energy needs. All citizens and residents will have access to affordable, efficient, socially responsible and reliable forms of energy". This strategic plan proposes to exploit local energy resources and reduce fossil fuel dependence.

In March 2013, Antigua and Barbuda released a Sustainable Energy Action Plan (SEAP), to foster energy conservation and efficiency, diversification of energy sources, sustainable energy consumption and generation as well as the utilization of renewable energy sources. In 2015, Parliament enacted the Renewable Energy Act of 2015, to establish a legal, economic and institutional basis to promote the use of renewable energy resources. Towards this end, Antigua and Barbuda will, **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.**

Domestic and industrial waste is a growing environmental concern in Antigua and Barbuda, whereas technological assistance could reverse this trend and create new opportunities. A preliminary review of annual waste streams to the sanitary landfill suggests that some 80,000 tonnes annually of feedstock could be available for conversion to energy if an appropriate

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14 Government of Antigua and Barbuda (GoAB), 2013. *National Inventory of Greenhouse Gases for Antigua and Barbuda: Inventory Year 2006*. Draft Report, p. 4.

15 Samuel, H. A., 2014. *Antigua & Barbuda Renewables Readiness Assessment (RRA) Background Paper, Working Draft for discussion at RRA Experts & Stakeholders Workshop*. IRENA, p. 6.

facility were available, mitigating CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub> emissions. Antigua and Barbuda's goal is to, **by 2020, finalize technical studies with the intention to construct and operationalize a waste to energy (WTE) plant by 2025.**

In 2006, land use change and forestry contributed 7% of national emissions.<sup>16</sup> Land use change can be mitigated through removal of GHG emissions by carbon sinks. The Environmental Protection and Management Act of 2015 establishes the legal backing such that, "Where the area is protected as a carbon sink it shall follow the principles developed by the UNFCCC."<sup>17</sup> **By 2030, all remaining wetlands and watershed areas with carbon sequestration potential will be protected as carbon sinks.**

In 2014, the transport sector consumed over one quarter of the country's fossil fuel imports, 20% of which were gasoline and 11% diesel.<sup>18</sup> The NEP addresses this emissions sector by *inter alia* recommending the use of vehicles with higher fuel efficiency and lower emissions, and support for hybrid, flex-fuel for electric vehicles as national targets. Antigua and Barbuda aims to, **by 2020, establish efficiency standards for the importation of all vehicles and appliances.**

### **Consideration of INDC Mitigation/Adaptation Co-benefits**

National circumstances highlight the country's exposure and vulnerability to climate impacts, and the ways in which mitigation actions, namely on and off-grid renewable energy, can increase resilience in critical sectors such as energy, water, health, and emergency services. Similarly, mitigation actions can have adaptation co-benefits. For example, expanding the protection of wetlands and watersheds to sink GHG emissions also serves as an adaptation strategy by enhancing water retention and reducing the risks of climate impacts, namely flooding and storm surge. Antigua and Barbuda recognizes the co-benefits of adaptation and mitigation in the area of low carbon development as an efficient and cost-effective strategy for sustainable development.

### **Additional Information on Support for Implementation**

Antigua and Barbuda requires international support from multilateral and bilateral sources, including through the Green Climate Fund (GCF), the GEF and the Adaptation Fund, for capacity building, climate finance and technology transfer to be able to strengthen its current programs, policies and regulations, to develop and implement new initiatives, and to fully assess and

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<sup>16</sup> GoAB, 2013. *National Inventory of Greenhouse Gases*, p. 4.

<sup>17</sup> GoAB, 2015. *Antigua and Barbuda Environmental Protection and Management Act of 2015*, Section 53(8).

<sup>18</sup> Samuel, H. A., 2014. *RRA Background Paper IRENA*, p. 9.

address the impacts of climate change, as defined in the adaptation and mitigation targets. Additional activities requiring support for implementation include, *inter alia*:

- Technology, human resources and financial capacity assessment;
- Support for the development of a Technology Strategy and Road Map that includes repurposing, decommissioning, and disposing of stranded assets;
- Comprehensive assessment of the national costs of adaptation and mitigation;
- Elaboration of a National Adaptation Plan;
- Enhancing Measurement, Reporting and Verification (MRV) processes;
- Development of standardized baselines to assess and monitor the impacts of implementing INDC adaptation and mitigation initiatives;
- Support for data collection, storage and management; and
- Support for education, training, public awareness, public participation, public access to information, and international cooperation throughout implementation of the INDC targets.

Antigua and Barbuda expresses that this INDC is provisional and an updated version will be submitted upon the completion of the Technology Strategy and Road Map and following ratification of the Paris Agreement in December 2015.