

'COP 26'

**THE BERMUDA DIFFERENCE IN  
CLIMATE CHANGE AND THE UN  
CONFERENCE OF PARTIES,  
GLASGOW**

NOVEMBER 2021

28th October 2021

## INTRODUCTION

Bermuda is not immune or isolated from the impacts of climate change. Our island is exposed to sea level rise, increasingly severe and frequent storms, and to changes in ocean currents and weather patterns. Isolated, beautiful, and unique, Bermuda is home to the most northerly coral reef system in the Atlantic Ocean which is a critical habitat for marine biodiversity as Bermuda is the only landmass in the Sargasso Sea, a floating rainforest of Sargassum seaweed that is a home and spawning site for several species of threatened and endangered marine wildlife. We are a treasure trove of environmental wealth, a capital of ocean conservation, and a key player on the global stage of financial risk management.

As an island community vulnerable to the effects of climate change, and as a global capital of climate related financial risk management, we are determined that Bermuda will participate in the international response to ensure our collective safety and prosperity.

To that end, we are declaring today that Bermuda is committed to increasing our protection of our fragile ecosystem, reducing our carbon footprint, and mitigating the impact of climate change. The work has already begun.



FIGURE 1: BERMUDA

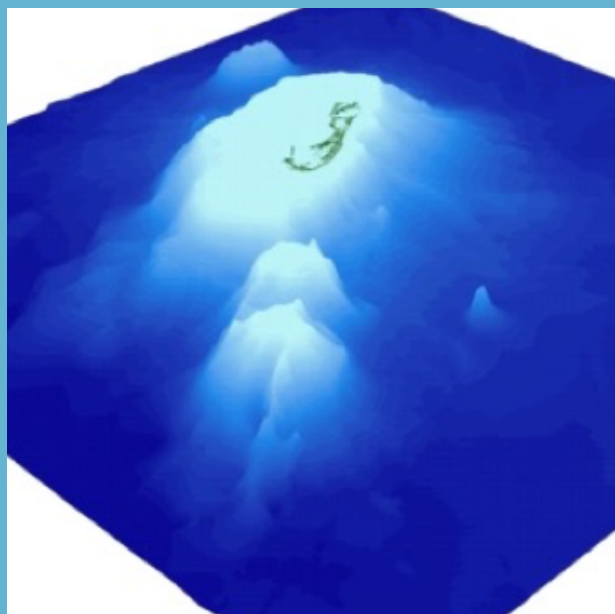


FIGURE 2: 3D PROJECTION OF BERMUDA AND ADJACENT SEA MOUNTS

## PROTECTING OUR ECOSYSTEM AND MITIGATING THE EFFECTS OF CLIMATE CHANGE

We continue to collaborate with our partners both locally and internationally to protect our ecosystem and to mitigate the effects of climate risk. These include:

### Reducing our carbon footprint

In 2019, the Regulatory Authority of Bermuda ('RA'), the agency responsible for the electricity and telecommunications sector, released the Integrated Resource Plan ('IRP') which sets the objective of achieving an 85% reduction in fossil fuel and a corresponding contribution of 85% from renewable resources by 2035. To this end, a number of Government buildings, commercial businesses and private residents are already investing in solar photovoltaic (PV).

A strategy has been introduced with an objective to achieve the reduction of transport related carbon emissions over the next 15 years starting with the electrification of vehicles beginning with Government vehicles and public transportation and also the banning of 2-stroke motorcycles. The installation of charging stations has begun, and the first new vehicles will arrive later this month.

### Protecting our environment and fragile ecosystem

In 2019 with our partners, the WAITT Institute and the Bermuda Institute of Ocean Sciences ('BIOS'), we began the work on the Bermuda Ocean Prosperity Programme ('BOPP') to develop an integrated marine spatial plan. This will include the designation of at least 20% of Bermuda's waters as fully protected fisheries replenishment zones within the comprehensive Marine Spatial Plan, and also protection of key habitats.

We have introduced strategies for the restoration of seagrass and mangroves in addition to increasing our protected species to include sharks to better manage imbalances in Bermuda's marine ecosystems. On land, we are introducing an island-wide tree planting strategy to remove invasive species, increase resilience to climate change, and improve biodiversity.

With a population of only approximately 62,000, Bermuda is not a major contributor to the floating garbage that threatens our pristine waters. However, we all have a role to play. To that end, we have developed a strategy for the elimination of single-use plastics by 2022 which has now been released for public consultation. Engagement has already begun with key stakeholders and the public in general. The Ministry of Home Affairs is working in partnership with the Ministry of Public Works to begin educating the public through lectures and social media campaigns highlighting the policy and encouraging reduction in the use of single use plastics.

### Increasing our Adaptability and Resilience

The Government's Bermuda Development Plan and Building Code has been updated to encourage and require adaptation measures, renewable energy and incorporating energy efficiencies.

A zoning system of the island is in place which allocates land for development and conservation purposes. Conservation zoned lands include Woodland Reserve, Agricultural Reserve, Open Space Reserve, Coastal Reserve and Nature Reserve. Protected areas are also featured which provides an added layer of protection to the coastline, our groundwater lens and underlying cave system, and the unique ecosystems that reside within. Such zonings are given precedence in the assessment of development proposals. Overriding objectives highlight the priority of sustainable development and the preservation of the natural environment from degradation.

All major development proposals must undertake an Environment Impact Assessment. This exercise tests the appropriateness of the selected site, identifies potential risks, and impacts of the project and aims to include mitigation solutions to offset negative impacts of the development.

Smaller projects which may pose impact to any protective zoning such as remaining wooded areas, agricultural fields, coastal areas, and other sensitive habitats typically require Conservation Management Plans. Such plans require the improvement and enhancement of the natural landscape and ecological balance.

The Government is taking steps to produce a climate change study to identify the most vulnerable areas and infrastructure assets on the island in the context of sea level rise, exposure to extreme weather events, flooding and other related impacts. An assessment of current data drawn from historical weather data and the recently completed LIDAR survey will be reviewed in tandem with future projections to develop appropriate strategies for mitigation.

The Government has developed a Water and Waste Treatment masterplan which will improve efficiencies and mitigate the effects of rising tides.



**FIGURE 3: COOPERS  
ISLAND NATURE RESERVE  
- HURRICANE IGOR  
REPAIRS 2010**



**FIGURE 4: PLASTIC  
DEBRIS ENTERING  
MARINE LIFE**



**FIGURE 5: SOUTHSORE  
BEACHES**

## **Investing in initiatives to support adaptation and drive economic growth**

Bermuda is the global capital of natural catastrophe risk protection. Bermuda's (re)insurers represent more than one-third of the global property and causality reinsurance market and have paid out more than a quarter of a trillion dollars over the last 20 years to cover claims stemming from disasters in the United States, United Kingdom and European Union. Building on decades' worth of resulting investment in human capital, business expertise and innovation culture, Bermuda will, naturally, play a leading role in Climate Risk Finance. As we have with tropical storm, wildfire, flood, and other climate driven insured risks, Bermuda can play a critical role helping high risk regions bolster their financial resilience to the rising tide of climate peril.

Bermuda will continue to encourage the exploration of innovation in the built environment and will welcome and explore new investments in clean and lower energy building and retro fits, low-carbon transportation, grid and infrastructure modernization, natural climate solutions, and community resilience.

## **Challenges**

As an island, we of course have challenges which include:

- An estimated 60 % of our potable water is derived from rain, not springs and rivers, nor desalination;
- 85% of our GDP comes from the financial services sector which includes global catastrophe insurance;
- Tourism accounts for only 5% of GDP, but accounts for a much larger percentage of employment. Fortunately, this is recovering fast as we emerge from the global health crisis, with visitors drawn by our renowned beaches in inland resorts.
- The Departments of Planning, Energy and the Environment and Natural Resources within the Ministry of Home Affairs have a combined budget of some \$12.2 million per annum;
- Custody of 173,890 square miles (450,370 km<sup>2</sup>) of the Atlantic Ocean, home to a rich wildlife, much of it under threat from pollution or over-exploitation

## 1.POLICY AND SOLUTIONS: INVESTMENT, INFRASTRUCTURE, AND CULTURE

Bermuda has a long history of anticipating developments. Recent initiatives include:

- Bermuda's Regulatory Authority of Bermuda (RA) released their first Integrated Resource Plan (IRP) in July 2019 outlining their proposed future energy requirements over the next 20 years. The plan demonstrates a cohesive blueprint in environmental leadership across the other island nations with the aim to reduce carbon emissions whilst mitigating a cost increase of electricity to citizens whilst not compromising on reliability. Being the capital of climate risk finance and risk management, the initiative will also increase investment opportunities both locally and internationally and provide jobs to construct and support the new infrastructure. The fundamental principles for successful execution will be high levels of investment in renewable energy resources. The island is currently scheduled to host a 60-megawatt offshore wind farm and up to 30MW of distributed generation for residential and smaller scale solar. Fossil fuel dependency will be phased out or used as back-up in support of the new generation of renewables and biomass is scheduled to be deployed by 2028 and added into the energy eco-system.



FIGURE 6: SOLAR PANEL: AIRPORT



- The RA chose from eight different energy-mix scenarios culminating in 85% of the island's electricity being generated from renewables by 2035 which is in excess of the 38% - the government's target policy. Another IRP by the RA is scheduled over the next three to four years and will be updated to reflect the pre-feasibility studies, technological advancements, and public sentiment on energy.
- As part of the RA's IRP on energy usage there will be a push towards electric vehicles and the reduction of vehicle emissions in which the island will see 2-stroke motorcycles being banned in a bid to further cut pollution over the coming fifteen years along with the electrification of the Government fleet, low-carbon transportation and the future allowance for electric vehicles and more modular and transportable energy. This could include liquid propane gas and clean burning propane, which is easier to produce, store and transport thus being less capital intensive and providing greater flexibility.
- Approximately \$42 million has already been invested by government and the private sector in renewable energy and/or environmentally friendly developments including the solar farm at the airport 'finger', installing solar panels for the Tynes Bay incinerator plant, and providing rebates to domestic households installing solar PV.
- The Bermuda Government has teamed up with WAITT Ocean Sciences to manifest a Bermuda Ocean Prosperity Programme ('BOPP'). 20% of the island's waters will be designated fully protected fishery replenishment zones to bolster important marine ecosystems whilst removing invasive and threatening species, improving biodiversity, whilst implementing restoration of threatened species.
- There is a strategy in place to eliminate single-use plastics by 2022. The strategy is a circular one whereby the single-use plastic items subject to regulation will be continually reviewed every few years.
- The Government's waste and water strategy will become more efficient and will also compensate for the impact of rising tides. Climate Wise which has a presence on the island along with the UK is co-ordinating the project group.
- The Department of Environment and Natural Resources has a long running "Lifeboat Project" to preserve the island's most threatened endemic species. Just as a lifeboat is defined as a small boat kept on a ship for use in an emergency, the same philosophy has been used for the conservation of Bermuda's threatened endemic species. Every effort is being made to safeguard the species on island Bermuda. Bermuda is working with other international agencies to save small populations of species for the future, at no cost to the island. This has been achieved by partnering with zoos in the United States of America such as Omaha Zoo and with institutions in Europe, specifically Durrell Wildlife, Royal Botanic Gardens at Kew, and most recently Chester Zoo. The Bermuda land snail and skink breeding and reintroduction programmes are still active, despite being temporarily handicapped by COVID. Plans are currently being made with Chester Zoo for snail & skink releases in 2022. Bermuda continues to work to safeguard against both manmade and natural disasters such as extreme weather events, loss of habitat, the introduction of a disease or pests.

- Recognizing the importance of managing invasive species and its interconnectedness to climate change mitigation, the Government has recently passed the Invasive Alien Species Act 2021. This new legislation will help protect the island from the negative impacts of pest species which can reduce the resilience of ecosystems to withstand the negative impacts of storms, rising tides, and salt inundation.
- The Government has embarked on a number of nature-based solutions to improve natural resilience to extreme weather events including better protection of vulnerable habitats and natural systems. A number of legislative measures have been enacted to better protect essential ecosystems. The Protected Species Act 2003 was amended in 2015 to protect critical habitats such as corals, seagrasses, and mangroves, as well as several other threatened endemic plants and animals. Additionally, Bermuda is in the process of amending the Fisheries Act 1972 and the attending regulations to protect sharks. This will assist in the rebalancing of an ecosystem currently out of synch with migrating turtle populations overgrazing local seagrass meadows to the point of complete denudation.
- The Development and Planning Act 1974 was recently amended to afford heightened protections to a specially protected class, upon which it is believed development should not be considered. A list of areas falling within this protected class may include areas of high ecological value such as nature reserves, actively cultivated arable land and significantly sized swaths of wooded land. Such areas would be enshrined in law and would require approval from the Legislature to remove.
- Active measures are also ongoing with projects such as the seagrass restoration project, active reef monitoring with a focus on coral bleaching events and scanning for Stony Coral Tissue Disease (SCTD). Following in footsteps of successful action taken after the Cedar Blight of the 1940s the Government is currently designing a Tree Planting Strategy and Action Plan that will look to not only at improving woodland quality and aesthetics but also look for opportunities to remove invasive species in vulnerable coastal areas and replant with native and endemic plant buffers, as well as provide shade trees and fruit trees.
- Measures are being taken to improve the island's food security that include the review of the National Crop Strategy and the draft Dairy Strategy 2016. This will be followed by the development of a Livestock Strategy. Actions are underway to introduce new technologies and more modern farming practices to improve the sustainable harvesting, processing, and storage of both fish and agriculture crops.
- The Ministry of Transport ('Transport') has engaged the Rocky Mountain Institute to consult on the electrification of vehicles and vessels to meet Transport's vision of going green by 2035. In the first instance, Transport committed to replacing its public bus fleet with electric buses and is expecting 30 electric buses in January 2022. Work will soon begin on the charging infrastructure to support the new buses.



- Transport is currently researching to recommend legislation and policies to support phasing out the importation and sale of internal combustion engine vehicles over the next 10-15 years. This will include the introduction of emissions legislation and upgrading emission testing equipment over the next five years.
- Transport will be launching its Transport Mobility Strategy in early 2022, which will set out Transport's plan to support local vehicle service providers, the on-island charging infrastructure, incentives to promote electrification in the transport sector, and a public awareness campaign for the roll-out of the initiative.
- The island has a successful science research permitting system that sees numerous US, Canadian and UK based universities undertaking a wide range of research in all areas of terrestrial and marine environments. As a condition of all research permit authors must provide a copy of their findings to the Bermuda Government.



FIGURE 7: ENDEMIC SKINK



FIGURE 8: ENDEMIC LAND SNAIL



FIGURE 9: SEAGRASS RESTORATION



FIGURE 10: ENCOURAGING FOOD SECURITY

## CONCLUSION

In the coming years, our Government will continue to explore initiatives in line with the international community to tackle the crisis. We look forward to working in close partnership and dialogue with public and private actors to achieve this shared vision.

We will consult with local and international leaders and community members and seek to embrace inclusive processes in the formation and implementation of new frameworks, policies, and programs to tackle the climate crisis. However, in addressing the climate crisis, and in participating in these collaborative efforts, Bermuda will endeavour to do so in a manner that does not exacerbate environmental justice conflicts nor ecological loss or damage.

How we address the issues of climate will help determine our collective future. Bermuda stands ready to do its part and to support mutually beneficial collaboration.

### Academic co-authors

Dr Sarah Manuel, Senior Marine Conservation Officer, Department of Environment and Natural Resources.

Dr Robbie Smith, Curator of the Natural History Museum, Bermuda Aquarium, Museum and Zoo (BAMZ), Department of Environment and Natural Resources

Dr Tammy Warren, Senior Marine Resources Officer, Department of Environment and Natural Resources.

Dr Geoff Smith, Environmental Engineer, Pollution Control, Department of Environment and Natural Resources.

Dr Shaun Lavis, Hydrogeologist, Pollution Control, Department of Environment and Natural Resources.

Dr Mark Outerbridge, Senior Biodiversity Officer, Department of Environment and Natural Resources.

Mr. Jeremy Madeiros, Senior Terrestrial Conservation Officer, Department of Environment and Natural Resources

### Sources

[www.bermudalaws.bm](http://www.bermudalaws.bm)

<https://environment.bm/>

White Paper - The Marine Environment and Fishing Industry in Bermuda 2005

Indigenous and Invasive Plant Guide 2016

Application for scientific research

Bermuda Crop Strategy 2016

Pollution Control Section, Department of Environment and Natural Resources

Natural History online public access catalogue

<http://b95017.eos-intl.net/B95017/OPAC/Index.aspx>

