

Applying Integrated Climate Risk Management (ICRM) on Renewable Energy in Barbados



Scoping research including gap analysis to inform Integrated Climate Risk Management (ICRM) Roadmap on Renewable Energy in Barbados

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Aims for the Session



- Brief review of the energy and renewable energy situation in Barbados
- Available mapping data and hazard assessments
- Identification of gap and barriers to the development of the ICRM Road Map
- Identification of actions to overcome barriers
- SWOT Analysis to integrate disaster risk reduction in the renewable energy sector

Energy Situation in Barbados



- Barbados is still heavily dependent on fossil fuels as the main source of energy for power generation
- Rising energy costs in addition to increased consumption of electricity forced the Government of Barbados (GoB) to make renewable energy (RE) and energy efficiency (EE) a national priority
- Barbados has an opportunity to increase RE in its energy mix as Barbados Light and Power Company Limited (BL&P) continues to retire existing generating capacity

Renewable Energy (RE) Situation in Barbados



- Barbados receives some of the best solar resources to accentuate the case for the development of distributed solar energy related technologies
- Over the past decade, solar water heating (SWH) has been the dominant solar application in Barbados resulting in substantial savings for the country
- There are more than 700 solar-PV rooftop installations that are grid-tied with more applications for grid connection pending

Renewable Energy Situation in Barbados



- Since 2010, energy generation using RE sources has been capped at a cumulative 10 MW due to concerns and a lack of knowledge on the impact of variable RE inputs into the national grid
- The GoB continues to pursue the objective of achieving 29% proportion of RE to the energy mix by 2029.

Past Climate Events



- In August 2017 and October 2010 saw the passage of Tropical Storm Harvey and Hurricane Tomas which resulted in disruption of power to sections of the island and loss of roofs
- Barbados has not been impacted by a catastrophic weather event since Hurricane Janet in 1955
- There have been a number of mapping exercises and assessments completed which explore the vulnerability of the island to the impacts of a changing climate and disasters

Hazard Mapping Data



TYPE	PURPOSE	COVERAGE	SCALE
Landslide	Serves as a guide for agricultural, residential and recreational land management	Scotland District	1:5,000
Flood	Development Control and Planning	Speightstown, Holetown, Weston, Constitution River and Wotton	1:2,500
Flood	Development Control and Planning	South and West Coasts	1:1,000

Vulnerability Assessments



TYPE	PURPOSE	COVERAGE	DATE PRODUCED
Human and Economic	To delineate the 5 yr, 20 yr and 100 yr flood plains	National	1996
Bio-geophysical and socio-economic	To assess the effects of sea level rise and potential for adaptation	Coastal Regions	2002
Tsunami	To evaluate possible impacts of Tsunamis	North West Coast of Barbados	Nov-99

Policies and Programmes



- National Communication Documents
- Caribbean Hotel Energy Efficiency Action 2009–2010 Project
- The Barbados Tourism Vulnerability Capacity Assessment Study
- Barbados Disaster Risk Management Strategy 2014
- CDM Strategy 2014-2024
- National Coastal Risk Information and Planning Platform (CZMU) (Hazard and Risk Maps - ongoing)
- Disaster Risk and Energy Access Management project

Barbados Light & Power Company Limited – Past and Present Resilience Activities



Barbados Light and Power
Company Limited

Disaster Management
Plan (Considers CC
impacts)

Vulnerability
Assessments on
Coastal
Infrastructure

Hurricane
Plan

Insurance and
Self Insurance
Programme

The ICRM Project in Barbados

ACRI+ promotes the ICRM approach in order to increase resilience

Prevent, e.g.

- Hazard mapping: vulnerability of power infrastructure (power lines, power station, solar, wind or biomass generators)
- Understanding of climate projections
- Ongoing maintenance during minor hazards to ensure continuous resilience
- Design to withstand projected hazards
- Encourage and enforce building standards and codes
- Land use planning with potential restrictions

Recover, e.g.

- 'Build back better' opportunity
- Design standards for resilient design
- Enhance building standards and codes
- Improved location based on risk mapping

Respond, e.g.

- Rapid repair and maintenance, access to spare parts, expertise and capacity through pre-established institutions and channels
- Access to finance immediate after a disaster

Residual Risk, e.g.

- Insurance for damage to the energy infrastructure (during construction and operation, such as property insurance, business interruption, third party liability)
- Insurance for low solar or wind output, shortfall of expected yield ("performance cover")

Prepare, e.g.

- Early warning systems for energy suppliers
- Contingency plans for damage to power generation and transmission infrastructure
- Disaster preparedness processes are in place (training)



Prevention



- Risk and vulnerability assessments on the RE Sector
- Climate Modelling
- Enforcement of building codes
- Public awareness programmes in the use of successful renewable energy technology in building resilience to climate change
- Property insurance

Prevention – Gaps and Barriers



- Availability and/or access to vulnerability assessments with a specific focus on the renewable energy sector
- Training and capacity building in the use of climate modelling (public and private sector)
- Awareness of programmes that promote successful renewable energy projects
- Percentage of houses/properties that are not insured or underinsured

Prevention – Potential Actions



- Completion of vulnerability assessments with a specific focus on the renewable energy sector (BREA, Division of Energy and donor agencies)
- Training and capacity building exercises in the use of climate modelling data (Caribbean Institute for Meteorology and Hydrology)
- Increase in public awareness programmes on successful projects which use renewable energy technology (BREA and BL&P)
- Assessments to confirm the number of properties that are not insured and/or underinsured in Barbados (General Insurance Association of Barbados and Town and Country Planning Department)

Risk Transfer



- Development of Risk Transfer mechanisms at both the micro- and macro level (Macro – CCRIF: Micro – Munich Climate Insurance Initiative and MiCRO)
- Introduction of new and innovative insurance products which would enhance the confidence of investors to finance RE projects

Risk Transfer - Gaps and Barriers



- Understanding of how traditional insurance products operate, let alone alternative risk transfer instruments
- Information on whether there is any interest in the development of an insurance product to protect RE infrastructure against the impacts of climate change
- Public awareness on the use of microinsurance programmes within financial institutions

Risk Transfer - Potential actions



- Conduct a market size study to confirm customer segment that would have an interest in a financial risk management instrument to protect RE technology and the type of risks to be addressed (GIAB)
- Consultations to determine the type of financial risk management instrument to be developed to address the risks (GIAB with support from CCRIF SPC)
- Training and awareness programmes for financial institutions in the use of micro-insurance programmes (Facility Supervisor for CCRIF SPC)

Preparation



- The ability of critical infrastructure (emergency shelters, health facilities, etc.) to function in the aftermath of a disaster
- Preparedness plans for SMEs and MSMEs in the event of extended disruption of power due to the impact of an extreme weather event

Preparation - Gaps and Barriers



- Community and resource centres, emergency shelters and health facilities do not have reliable back up power
- Many small businesses have not developed business continuity plans or have limited capacity to develop one.

Preparation - Potential actions



- Outfit community centres, health facilities (and other critical infrastructure) with solar Photo Voltaic Systems. Ongoing through the DREAM project (Office of the Prime Minister and the Division of Energy and Telecommunications)
- Training and capacity building in the development of business continuity plans for SMEs and MSMEs (Barbados Chamber of Commerce and Industries and GIAB)

Response



- Repairs to RE infrastructure after the impact of disaster
- Ability to renewable energy infrastructure quickly after a disaster
- Ex Post Financing and Claims Processing

Response - Gaps and Barriers



- As RE systems are imported, it may take some time to replace/repair infrastructure after a disaster
- Availability of quick liquidity to pay for the repairs and replacement of parts for infrastructure

Response - Potential actions



- Assess the potential for the manufacturing of renewable energy infrastructure on island. (BREDA, Energy Division, Ministry of Environment, Ministry of Finance)
- Create further partnerships between insurance companies and microfinance institutions/credit unions in order to provide easy access to financing to purchase parts for repair or replacement (Banks and Credit Unions; GIAB)
- Design of a mechanism to disburse funds quickly to the general population after the impact of a disaster (GIAB and Credit Unions)

Recovery



- Opportunity to build back better
- Enhancing Building Standards and Codes
- Improved site selections for properties or assets based on risk mapping
- Making the grid more resilient to climate risks (e.g. Burying transmission lines, using battery based energy storage to keep the grid operating)

Recovery – Gaps and Barriers



- Out of the all the phases in the disaster management cycle, “Recovery” is the least understood
- Limited Capacities and decentralised structures for emergency and disaster response and recovery
- Building back better, although required, can have significant impact on construction costs
- Enhanced designs (e.g. more concrete and steel) can also have an impact on insurance premiums

Recovery – Potential Actions



- Continue strengthening governance and institutions to manage disaster risk (Department of Emergency Management with support from CDEMA)
- Contractors could be required to undertake specialized courses and receive certification to support their implementation of the building code (Barbados Association of Professional Engineers and Ministry of Education)
- Assessment on the impact of “Building Back Better” (BBB) on the insurance premiums and affordability as a result of BBB (GIAB and Ministry of Finance)

CONCLUSION



- There have been a number of projects which aim to increase the use of RE technologies which have been supported by both the public and private sector and these types of projects will increase in the future
- Given the passage of Hurricanes Irma and Maria, the concepts of vulnerability and resilience will be reassessed, especially for key sectors such the energy sector which is already characterised as being vulnerable to the impacts of climate change
- Consideration to safeguard the infrastructure of renewable energy infrastructure, the users of the technology and potential investors is not only timely but should be treated as a high priority.
- Continued hazard mapping exercises and vulnerability assessments should now consider the impacts of extreme weather events on the renewable energy sector
- The GoB being a member of CCRIF provides an opportunity for the further introduction of alternative risk transfer mechanisms to the local insurance market (MSMEs and financial institutions)
- The development of initiatives which encourage a partnership between the provision of innovative insurance instruments and increased investor confidence can also be explored as a tool for DRM, but also to create opportunities for further renewable energy penetration

SWOT ANALYSIS TO IMPLEMENT DISASTER RISK REDUCTION IN THE RE SECTOR

STRENGTHS

BL&P – Committed to transitioning from Fossil Fuel to RE

History of developing and installing RE technology (SWH)

Barbados Renewable Energy Association

GoB is committed to achieving 29% proportion of RE to the energy mix by 2029

WEAKNESSES

Limited availability of Data

Limited public awareness of successful RE projects

Uncertainty on the impact of variable renewable energy inputs into the grid.

Limited understanding of financial and insurance tools for RE

OPPORTUNITIES

ICRM road map will be the first of its kind for the RE sector

NDC Report – Highlights adaptation related benefits of mitigation actions through energy access and security

CCRIF SPC – Interest in providing coverage for the energy sector

DREAM Project – Using RE as a tool for DRM

UNDP GEF Programme (and other donor agencies) – Financing projects for MSMEs to incorporate RE as part of their business activities

THREATS

Limited availability of financing to develop an efficient monitoring and evaluation plan

Government of Barbados reducing the budget allocated for disaster management

Insufficient scale to capture interest of the local insurance industry



THANK YOU!!