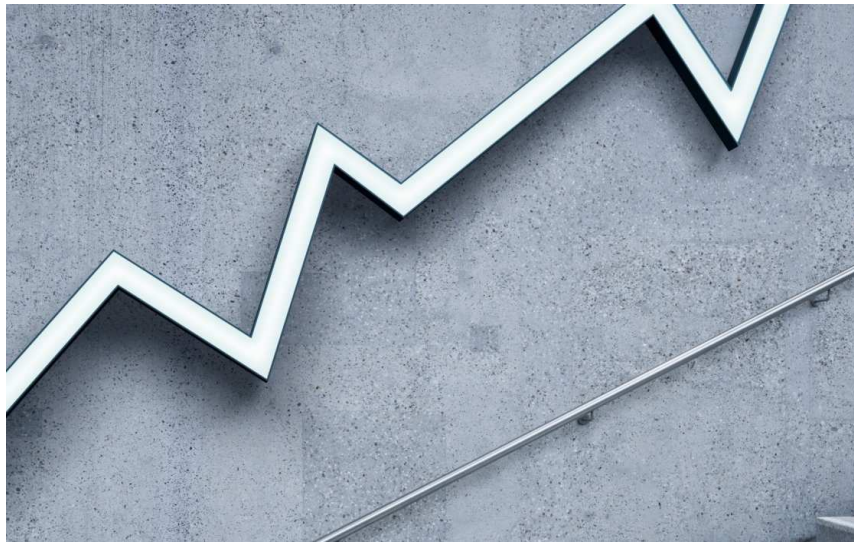


Implementing Barbados' 100% Renewable Energy Policy and Progress in Sustainable Transport

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THE KEY CONSIDERATIONS IN DEVELOPING THE PROPOSED BNEP

BNEP was developed using a bottom-up collaborative approach which including several rounds of interviews and consultations throughout Barbados' energy sector.

The key approach used in developing BNEP was a Multi Criteria Approach (MCA) , where the impacts of the policies chosen were considered from as wide ranging a perspective as possible.

The issues related to finance, economics, natural environment, technology and social development were considered in a consolidated manner.

BNEP as a proposed policy that spans all the aspects of the energy sector, examines aspects related to both renewable and fossil fuel based energy.

The proposed BNEP aims to provide a framework for moving the island from a fossil fuel based economy to one based on renewable energy sources.

Visionary Goals

- An energy sector that offers a diversity of sustainable energy options, with a trajectory to achieve 100% Renewable Energy.

DIVERSITY

1

- An energy sector where consumption and production of energy resources occur with the maximum level of efficiency feasible.

EFFICIENCY

2

- An energy sector that offers basic energy products and services that are affordable to local citizens.

AFFORDABILITY

3

- An energy sector that offers continuous and reliable supply of energy.

RELIABILITY

4

- An energy sector that offers opportunities for development of human capacity and collaboration.

CAPACITY &
COLLABORATION

5

- An energy sector that offers significant opportunities for local entrepreneurship and international investment.

ENTREPRENEURSHIP

6

- An energy sector that minimizes environmental impacts and contribution to global climate change.

ENVIRONMENT

7

- An energy sector that is governed by sound management and clear legal regulatory frameworks.

REGULATION

8

- An energy sector that positions Barbados as a centre of excellence for innovation, research and development in renewable energy.

INNOVATION

9

- An energy sector that provides opportunities for all Barbadians (including the most vulnerable to the impacts of climate change) to participate in and benefit from the transformation to 100% renewable energy.

ECONOMIC
ENFRANCHISEMENT

10

Technologies And Land Considerations

Wind – 166 MW

- Onshore
- Offshore

Solar – 340 MW

- Centralised – utility scale ground mount systems
- Distributed – 80% rooftop and 20% ground mount

Biomass, Landfill Gas & Waste to energy – 33 MW

- Mass burn
- Biogas
- Land-Fill Gas

Storage - 204

- Batteries

Land Requirement

- Solar - 5 to 6.5 acres per MW
- Wind - 35 acres per MW
- Biomass - 500 acres per MW (for Fuel Crop such as sugar cane)

Schedule and Investment of RE Technologies

Renewable Energy and Storage Required Capacity (MW) - Scenario 3											
Technology:	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Solar	42	35	32	30	47	45	24	22	22	41	340
On-shore Wind	-	6	20	20	20	20	20	20	20	20	166
Waste to Energy					8						8
Biomass					20						20
Landfill Gas					5						5
Total Renewable Energy	42	41	52	50	100	65	44	42	42	61	539
Storage:											
Battery 3H	-	-	50	-	-	-	-	-	-	-	50
Battery 4H	-	43	50	2	-	-	-	1	29	29	154
Total RE & Storage	42	84	152	52	100	65	44	43	71	90	743

Scenario 3 – Total costs [Costs (million BBD), LCOE (BBD/MWh)]							
Year	Fuel Cost	Start and Shutdc	Emissions Co	VO&M Cost	FO&M Cost	Annualized Build Cc	LCOE Cost
2021	138.41	4.18	121.15	42.16	20.4	7.64	336.67
2022	114.75	0.04	94.01	49.98	22.38	25.96	299.45
2023	112.99	0.03	83.75	54.12	34.62	60.62	326.16
2024	112.5	0.04	74.2	57.49	37.94	71.47	328.35
2025	57.8	0.3	35.61	60.78	56.01	129.67	302.82
2026	27.9	0.3	17.02	62.36	65.13	160.49	282.46
2027	23.34	0.29	13.68	63.55	68.12	167.92	272.08
2028	24.02	0.32	14.21	64.79	71.63	175.34	264.87
2029	18.9	0.33	11.3	65	76.83	187.39	262.18
2030	12.16	0.35	7.73	64.9	88.25	222.75	278.75

Source: Integrated Resource an

The Main Phases of the Implementation of BNEP 2019 - 2030:

The implementation is based on three distinct phases that relate to market preparation, market diffusion, and market saturation.

Phase I - Market Preparation

- Analyse:
 - the present energy system
 - 100% renewable energy target system
 - Establish the transition pathway
- Target setting validation:
 - stakeholder dialogue
 - establish policy targets and period that such targets are to be achieved
- Lay foundation:
 - detailed resource assessment – Integrated Resource Plan, Grid Modernization Plan
 - solidification of policy framework
 - build capacities
 - secure funding

Phase II market diffusion

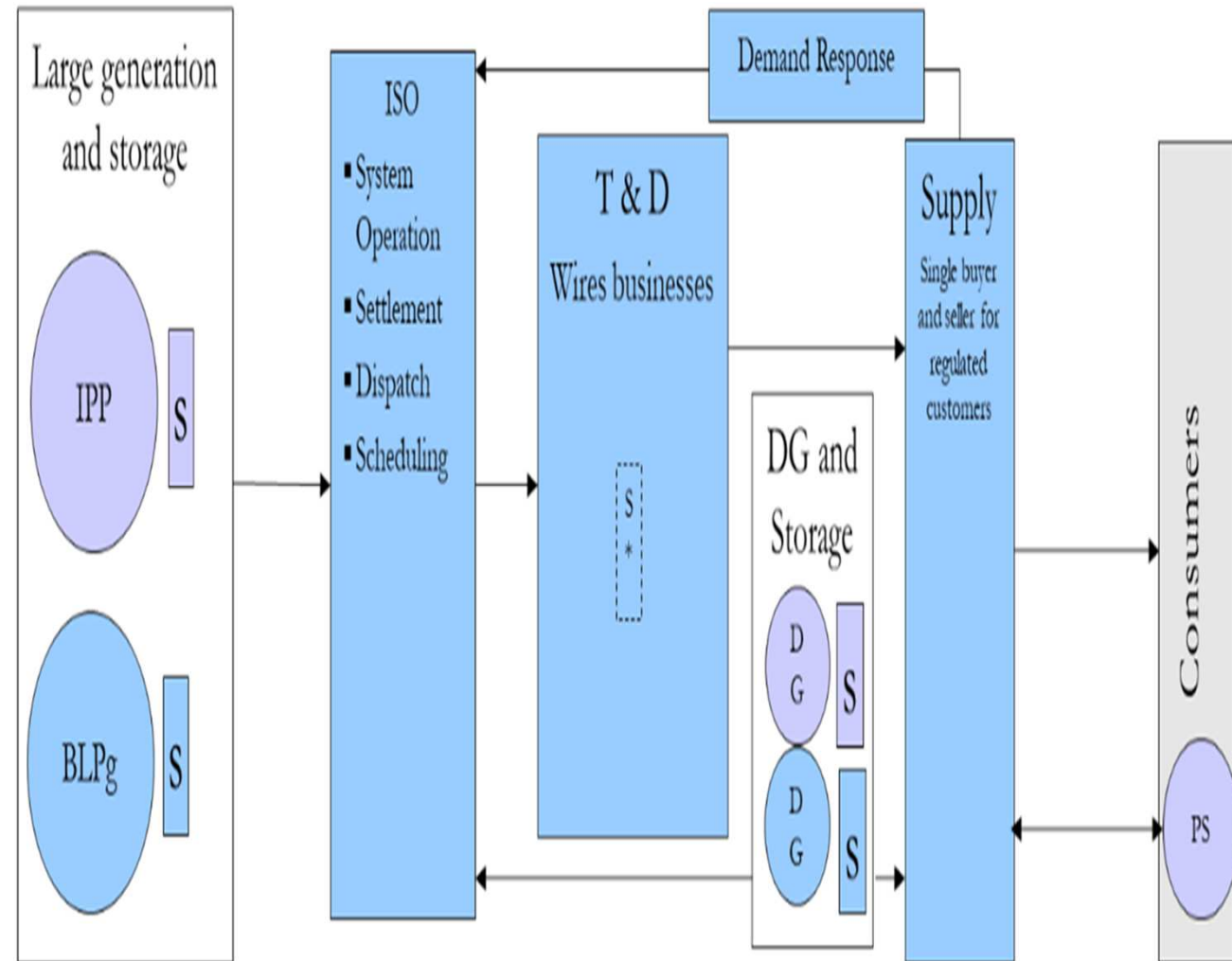
- Power system strengthening and development:
 - building up the renewable energy capacities
 - grid strengthening and extension
 - the phasing of storage
- Renewable energy mobility:
 - Building infrastructure – Grid Modification
 - add additional renewable energy technologies
 - Accelerate the use of electricity-mobility where feasible

Phase III concentrate on market saturation

- Market Saturated with Renewable:
 - the final diffusion of renewable energy to achieve 100%
 - reach the last stage of storage expansion
 - deploy green and e-mobility to 100%
 - the expansion of renewable energy to keep pace with growing energy demand.

New market structure

Accounting and Technical Data
Unbundling



Progress towards 2030 goals

Installed capacity
70MW
(incl. 10MW utility scale PV plant)

Electricity produced
9.2% of Barbados' demand

Policy Development

- New utility licence negotiations completed
- To promote transparency and fair play for all investors

- The Cabinet Mandated that all new vehicle procured for the Gov't Fleet must EV or Hybrid

- Draft Wind energy policy guidelines for On-shore Wind
- To define wind zones and facilitate investment

Economic Incentives

- Premium on current tariffs
- Within the next 6 months for systems 1 MW to 5 MW
- If investors commit to installing within the next 2 years

Duty concessions
Renewable energy equipment are duty free and reductions in duties for Evs and Hybrid Vehicles.

Technical Studies

- Integrated Resource and Resilience Plan (IRRP)
- To guide future energy planning
- Generation capacity, technology types, grid upgrades

- Ocean Energy Studies
- Investigative studies into Offshore wind and OTEC

- E-mobility Strategy

- Storage Study

Action Plan IRRP

- Storage Policy App

- PPA Templates for RE Technology Deployment

- Grid Modernization Plan

- Informational dashboard to Monitor Development

- Distribution Hosting Capacity Study

Recent Important Developments to note

Feed in tariff

- Feed in tariffs exist for RE systems up to 10MW
- Guaranteed rates for up to 20years

Local content

- 30% local ownership and participation required

Technology type

- RE technologies must be commercially viable
- Wind, Solar, Bioenergy (will be expanded in the future)

Land use

- RE sites on non-arable, sub-prime land preferred
- Dual land use will be encouraged (RE & agriculture)

Some of the Key Actions and Projects In The Pipeline

Competitive Procurement Process

- Establish Competitive Procurement System for RE systems greater than 10MW

Change Management

- Make significant adjustments to the legal administrative and technical framework to facilitate the implementation process.

Lambert's Wind Farm

- The GOB is work with the International Financial Corporation to install at least 30 MW of wind energy at Lambert's in St. Lucy.

Key Next Steps & Investment Considerations

from the Integrated
Resource and
Resiliency Plan

Develop Renewable
Energy Resource
Procurement Process
and Mechanism

Develop Storage
Rates

Address Land and
Environmental issues

Develop Grid
Modernization Plan,
design and cost

Establish New
Legislation to Enable
a More Diverse
Electricity Subsector

Power Purchase for
Agreements Up to 10
MW and for Larger RE
Systems Great 10
MW



Thank you!

