Jamaica's Energy Future: 2017-2030

How do we achieve Energy Security and Development?

Women in Energy Conference

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Permanent Secretary

Ministry of Science Energy and Technology (MSET)

Global Energy Outlook

- 30% ↑ in the Global Energy Demand and 85% ↑ in energy consumption for non OECD countries by 2035 – 2040.
- Gas/LNG will be the main energy supply in the future (increase to 50%); coal use ↓, Oil% constant, energy mix diversified.
- Government's Policy and Regulatory Framework will determine fuels used, future of renewables and meeting emission targets (Paris Agreement).
- Mechanism of Carbon Pricing, Coal Ban and 40% renewables needed to achieve global emissions target.

Agreements in Energy for Jamaica

- Signatory to the Paris Agreement, UNFCC (Kyoto Protocol) and SIDS Dock (Caribbean Centre for Renewable Energy and Efficiency).
- An Observer to the Global Bioenergy Partnership (GBEP) of the FAO, UN.
- Member of the International Atomic Energy Agency (IAEA) since 1965.
- Submitted INDC to UNFCCC based on Jamaica's RE target: should lead to 7% CO_2 reduction from BAU scenario.
- Multiple bilateral agreements and partnerships signed (e.g. ESCO), as well as GOJ investments positioned Jamaica on the right path towards Energy Security.

Strong Policy and Legislative Framework

POLICY

National Development Plan VISION 2030

Concrete policy with measures to incentivize sustainable development.

NATIONAL ENERGY POLICY 2009 – 2030

- Waste to Energy
- Renewable Energy
- Biofuels
- Carbon Emission & Trading
- Energy Conservation & Efficiency

Designed to enhance energy efficiency and diversification in order to provide high-quality, affordable, environmentally friendly energy and reduce Jamaica's dependence on high cost imported oil.
Target of 20% renewables and 30% electricity generated from renewables by 2030.
Five Draft Sub-Policies

LEGISLATION

GAS ACT (LNG)
Future Legislation

ELECTRICITY ACT

- Objective 3(a), (c), gives provision for modern electricity system and promotion of energy efficiency and renewable energy sources (RES).
- Integrated Resource Plan (IRP) is a comprehensive support tool to provide reliable, low-cost and efficient electricity service.
- Provision for Net Billing, Power Wheeling and Auxiliary Connections

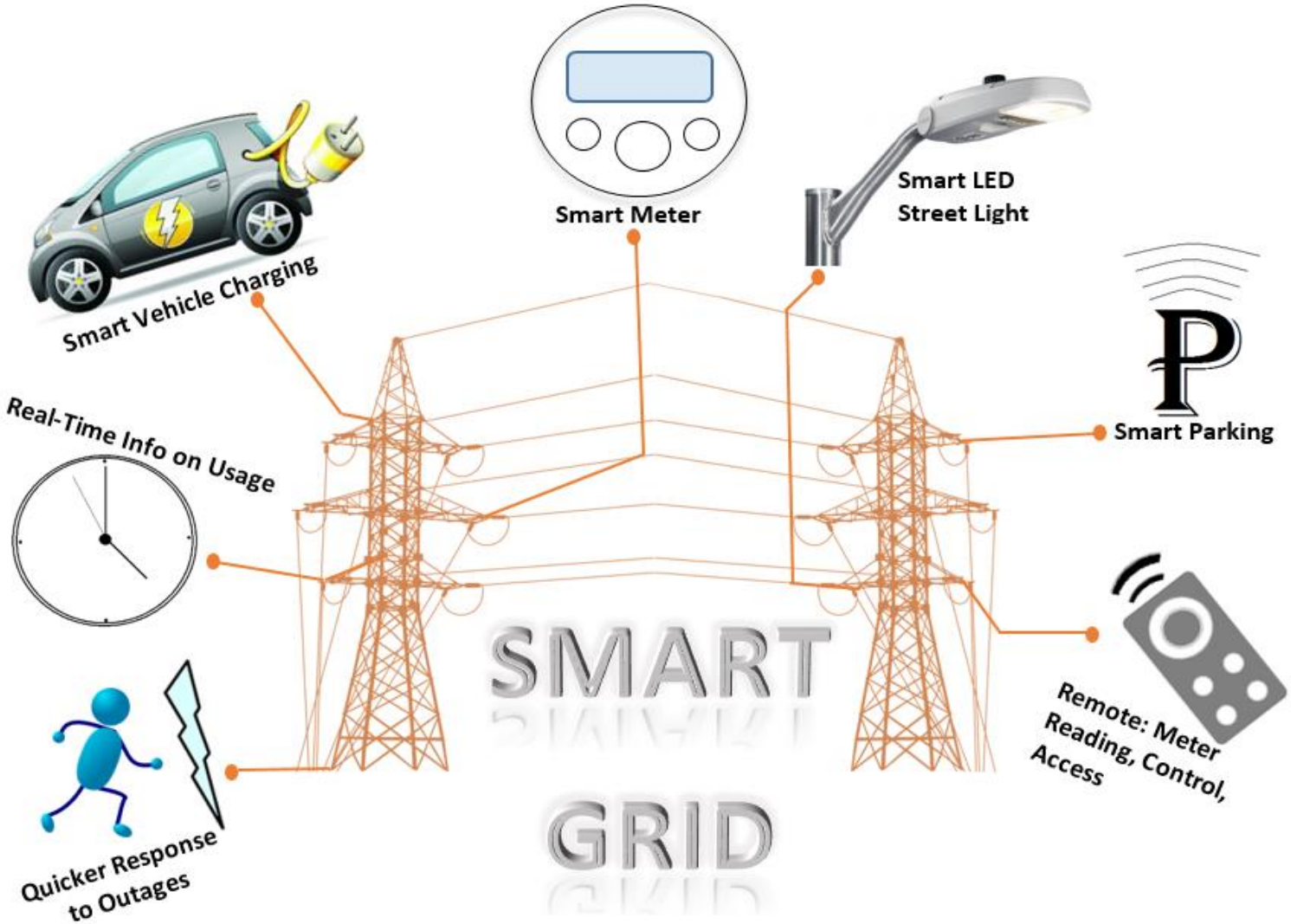
Framework Awarded by the IMF: **Best Government Infrastructure Strategy, Caribbean 2016**

NEP Adapted in CARILEC Energy Policy

GOJ/USA MOU Jan. 2015: Clean energy development, Scale up of RE and loss reduction/JPS

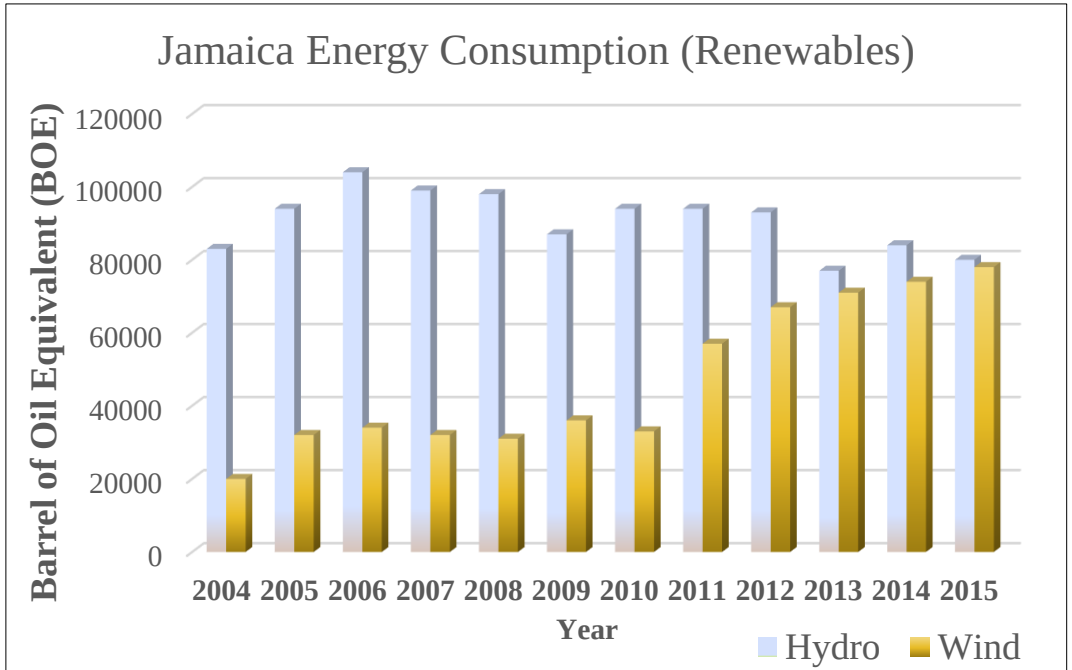
Outcomes of an Effective Framework

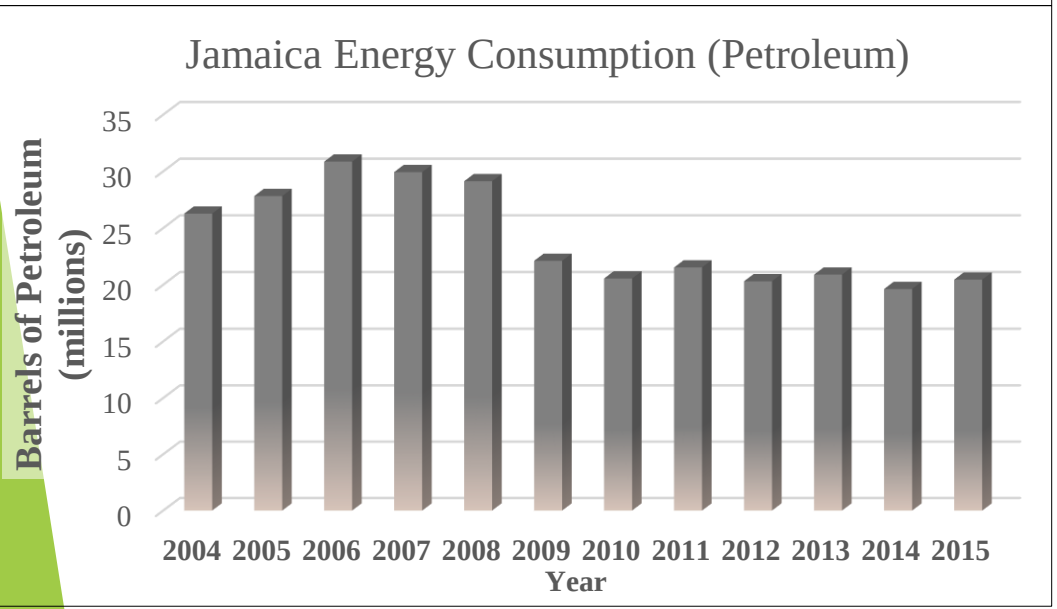
- The NEP's solid framework has increased international confidence and attracted investments in RE.
- The Electricity Act gives the framework to ensure energy security through diversification of energy sources:
  - *Provide for a modern system of regulation of the generation, distribution, supply and use of electricity.*
  - *Promote energy efficiency and the use of renewable and other energy sources.*
- Amended Petroleum Act extends PCJ's role to 'explore and develop renewable and other energy sources'.
- Regulatory Structure requires development of a smart grid by the utility.

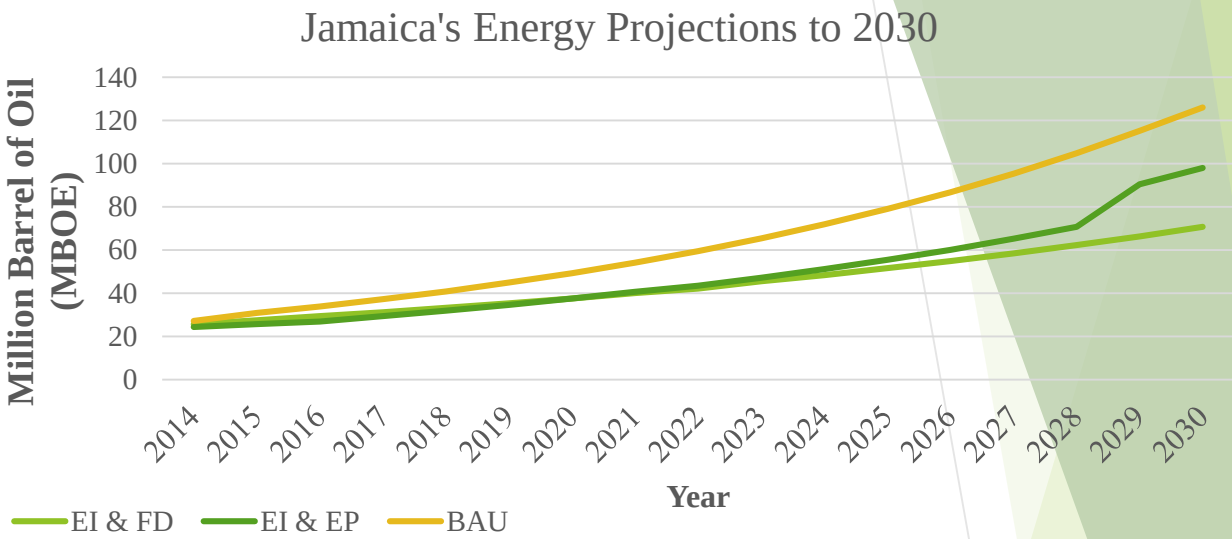


Smart Grid: Optimal use of equipment, improved grid management; RE integration; enhanced IT capabilities – communication and security (e.g. JPS New Kingston Smart City pilot)

Progress and Achievements







EI&FD: Efficiency Improvement and Fuel Diversification
EI&EP: Efficiency Improvement and Conservation Projects
BAU: Business as Usual

- BAU scenario: ≥120 million barrels of oil equivalent (MBOE) projected by 2030; Projected demand growth of 2.5% per year by 2030 = Doubling of Generation capacity. Energy efficiency strategies and fuel diversification will reduce the value to <80MBOE.
- Between 2004 and 2015: Petroleum consumption ↓ RE: ↑
  2016 Renewables account for 10.5% of energy = 158,000 BOE and USD$6.8M/year.

Progress and Achievements

Energy Investments

Grid Generation Capacity is 926.5MW. To date, a total of **156.5MW** RE capacity added with investments amounting to **US$323.2million**

In 2016 **80MW** of energy capacity added through RES:

24MW -Wigton III; 36.8MW – BMR; 20MW - Content Solar..

Net Billing: 2751MWh added to the grid from 2013 to 2016 = reduction of 1623 BOE.

Eight Rivers Solar Power Plant will add **33.1MW** capacity. (US$50 million)

Agreement signed with New Fortress Energy & JPS for **LNG plant** which will convert**120MW** capacity at Bogue and **190MW** new plant at Old Harbour.

Hydropower

Nine hydropower plants in operation with total capacity of **30.7MW**.

With IDB funding, hydro-feasibility studies completed on six rivers as a part of an INTEGRATED RESOURCE PLAN (IRP) and **26MW** generation capacity identified.

- Will replace **56,000 BOE**
- Will save > **JM$247million/year**
- Will reduce **72,000 MT of CO_2**

Carbon Emission Reductions

From 2004 to mid-2016, Wigton (largest windfarm in the English-speaking Caribbean) reduced CO_2 emissions by 800,000 metric tonnes (*t*).

2,514*t* CO_2 reduced through ESEEP.

Low carbon options through biofuels (e.g. bioethanol) leads to reduced CO_2 emissions.

Additional

1,954 BOE reduced through the Energy Efficiency and Conservation Project (2012-2016).

Under BAU scenario, US$4.6billion spent on oil by 2020; with energy efficient actions, reduced by US$1.7billion.

Bureau of Standards of Jamaica now equipped to test components/appliances for compliance with EE standards.

To the Future: Strategies and Purpose

- To meet the 20% RE target by 2030, an additional 500MW of Renewable Energy Capacity is required.
  - Need for further energy investments into the grid.
  - Self-Generating customers continue to increase and their access to the grid frees the baseload capacity for industrial production.
  - RE Storage

PURPOSE

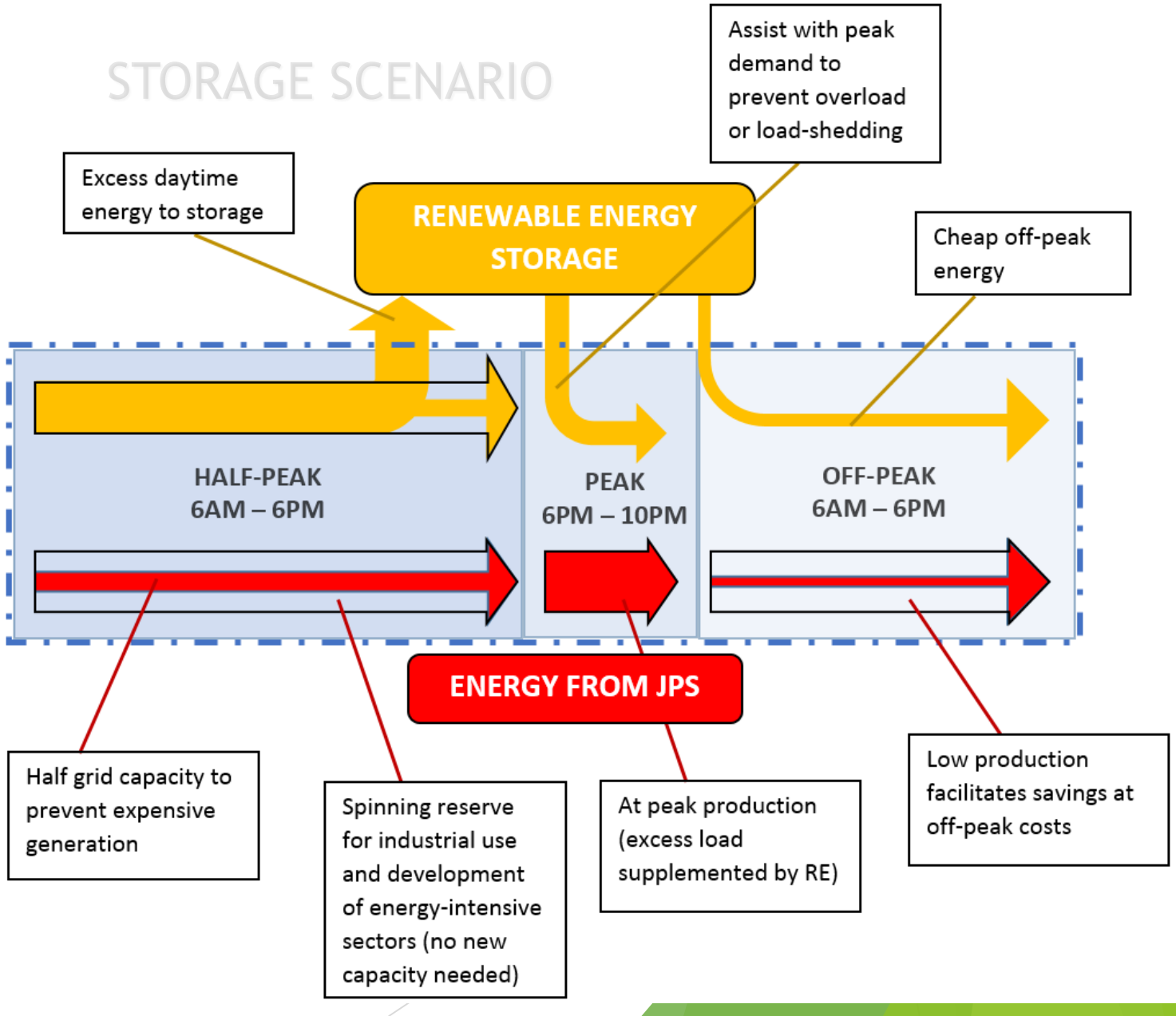
Every $$$ saved in ENERGY releases capital critical infrastructure and services that create growth

- Expanding LNG Infrastructure
- Development of Biofuels industry
  - Displace 97,000 barrels of oil and save JM$633 million annually
  - Employment increased in agriculture by 3000 persons
- Petrojam Refinery Upgrade – will improve plant efficiency; produce ULSD for transport sector and Maritime requirements)
- Import substitution & export opportunity >US$350M/year (asphalt, VGO & jet fuel)
- Need for Private Public Partnerships and JAMAICAN investment in energy infrastructure
- Smart Grid development

Strategy: Grid Energy Storage

- Forms of Grid Energy Storage:
  - Air (compressed, liquid)
  - Batteries
  - Electric Vehicles
  - Flywheel
  - Hydrogen, etc.
  - Hydroelectricity (pump storage)

- Pumped Storage Hydroelectricity is the largest capacity grid energy storage; >96% of storage installations globally and total installed capacity of 168GW.
- Energy Storage in Jamaica will require effective transmission and distribution lines, as well as the Smart Grid
- Important because the spinning reserve can be used for industrial activities.



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