



energy policy

GOVERNMENT OF THE VIRGIN ISLANDS

ENERGY POLICY

Made - - - - - 14th September 2016

Laid before the House - - 13th October 2016

Contents

context	1
purpose	2
energy policy goals	3
guiding principles	3
energy strategies and policy actions	4
supply-side strategies	5
increase renewable energy generation	6
diversity fuel sources	7
leverage growing waste stream	7
improve supply side competition	8
conduct long-term planning	8
improve supply-side energy efficiency	9
demand-side strategies	9
develop portfolio of end use programs	9
encourage distributed resources	10
cross-sector strategies	11
develop comprehensive transportation plan	11
energy awareness & outreach campaign	12
workforce & private sector in re	13
infrastructure strategies	13
establish an independent energy regulator	14
improve transmission & distribution efficiency	14
modernizing the grid	14
improve resilience of the energy infrastructure	15

ENERGY POLICY OF THE VIRGIN ISLANDS

1. Context

The British Virgin Islands (BVI), a British Overseas Territory of 59 square miles, consists of approximately 60 islands, cays and islets. The majority of its population lives on the four main islands of Anegada, Jost Van Dyke, Tortola, and Virgin Gorda. Tortola is the largest in size and population, and is considered the territory's central business district. While BVI's main electricity generation plant is on Tortola, the largest consumer of electricity is on Virgin Gorda which is connected to Tortola's power supply by a submarine cable. Tourism and financial services are the main drivers of the Territory's economy, as well as the main sectors of energy use. As such, reliable and affordable energy supply is vital to the Territory's population and economy. At the same time, as an island Territory, the BVI will be among the earliest and most affected by climate change. This is due to its relative isolation, its sensitivity to weather changes, as well as the proximity of its critical infrastructure and economic activities to the coastline. As a result, BVI is cognizant of the importance and its role in mitigating climate change.

BVI has a wealth of untapped renewable energy resources, including solar, wind, wave, and waste that can be converted to energy. In addition, the Territory has a well-developed supply and distribution system for power derived from the Territory's sole publicly-owned utility company—namely the British Virgin Islands Electricity Corporation (BVI EC).

Despite these potential advantages, BVI currently relies on imported oil and gasoline for nearly all of its energy and transportation needs. The dependence of oil is woven into every fabric of BVI's economy: nearly all goods are imported via diesel-powered ocean liners; and BVI's connection between its islands and to the outside world is mainly dependent on diesel-powered ferries. This leaves the Territory vulnerable to fluctuations in global oil prices, which affects household energy costs, as well as the cost of all goods and services. In addition, burning of fossil fuel has negative environmental impacts due to emission of greenhouse gases.

BVI Energy Usage and Production Overview

BVI EC

Customers: 16,638

Peak Demand: 34 MW

Reserves: 38%

Installed capacity: 40 MW

(Rented: 4 MW)

(In development: 26.1 MW)

Primary fuel type: Diesel

Fuel imports: >99%

Renewables share: <3%

T&D losses: 6-8%

Electricity rates: 25-40 ¢ /kWh

Fuel charge: 2.3-18¢ /kWh

End Use

Cooking: LPG*

*With increasing usage of electricity

Transportation

Vehicles: 17,000

BVI currently has a stable energy sector; however, the dependence on a single utility operating from a single energy source makes the Territory more vulnerable to risks that can negatively impact the Territory's future development. Recognizing the importance of energy to the Territory's economic and environmental sustainability, the Government of the Virgin Islands has already taken steps to address these issues. Based on a 10-year energy vision developed in 2013¹, BVI has the following energy targets:

- By 2023, supply 30% of the territory's energy by renewables means;
- By 2021, fossil fuel imports decrease by 20%;
- By 2021, 50% of consumers will use energy conservation measures and/or renewable energy technology of some kind; and
- By 2021, Anegada reduces fossil fuel inputs to electricity by 80%.

Furthermore, the Government has forged ahead with a number of initiatives toward its energy goals, including modernizing the 1979 legislation to encompass renewable energy development, amending the 1999 associated regulations, implementing various conservation initiatives, energy efficiency measures, renewable energy systems and starting a campaign to educate the public on conserving energy and water.

The Government has taken a proactive approach to driving the transformation of BVI's energy landscape to address current energy issues and future energy needs. By developing a policy, the Government is laying a foundation for a roadmap to work jointly with BVI's utility, residents, homeowners, businesses, and even visitors to achieve a sustainable energy future.

2. Purpose

A comprehensive policy is necessary to address current energy issues and trends in BVI's leading industries. This policy aims to accommodate BVI's growing energy demand, while maintaining environmental stewardship, reliability, and affordability. The Energy Policy addresses the following:

- Energy Policy Goals to incorporate into the policy. Goals are measurable objectives which establish how the Government will plan for future energy activities.
- Energy Targets measure desired outcomes for the Energy Policy Goals.
- Guiding principles to establish criteria for instituting energy targets, strategies, and action plans.
- Actions as a set of activities within the context of an overarching strategy which supports the goals of the Energy Policy.

¹ Energy Policy Framework for the British Virgin Islands, provided by BVIEC to DNV GL on 22 April 2014

3. Energy Policy Goals

In January 2016, BVI stakeholders prioritized a set of policy goals put forth by the Ministry, BVIEC and its consultants. This policy aims to facilitate BVI's path to its energy future by implementing strategies that will achieve the following:

1. **Environmental stewardship** – Minimize environmental footprint, including air, water, land, and wildlife by promoting energy efficiency and renewable energy.
2. **Reliable energy supply and distribution** – Reduce dependence on oil imports by fuel diversification with a special emphasis on local renewable resources; minimize energy disruptions through long-term integrated energy planning of resources and infrastructure; enhance disaster preparedness and resilience of energy infrastructure.
3. **Lower energy costs** – Reduce energy capital and variable costs through integrated energy resource planning; increasing energy supply, delivery of energy, and consumption of energy.
4. **Job and industry creation** – Focus on the economy by developing local energy resources; develop and employ local talents in the energy industry; and create stable, predictable, and sustainable markets within BVI that support local energy services' needs.
5. **Consumer energy awareness** – Increases consumer energy awareness through public education campaigns on policy issues and initiatives such as conservation, energy efficiency, and self-generation programs.

4. Guiding Principles

The strategies set forth in the policy are guided by the following principles:

- Minimize regulatory and administrative bureaucracy
- Coordinate among all energy programs, including harmonizing new programs with existing ones
- Leverage local resources where possible
- Create stable, predictable, and sustainable markets for energy efficiency and generation suppliers and consumers
- Efficient use of existing physical and administrative infrastructure
- Leverage lessons learned from other small island countries to inform policy
- Strive for collaboration and coherence across other British Overseas Territories and the Caribbean region.

- Assure access to affordable energy by the poor and vulnerable customers in line with Government policy
- Maintain financial health of the islands
- Coordinate with initiatives across sectors as they are impacted by infrastructure decision
- Support and coordinate with the Virgin Islands' Climate Change and Adaptation Policy and Disaster Management Policy
- Ensuring the financial viability of the entity charged with the management and maintenance of the national electric grid

5. Energy Strategies and Policy Actions

Below is an outline of energy strategies for the time horizon 2016-2026. Each strategy is tied to the overall goals that were set forth by BVI stakeholders. The strategies are tied to specific actions (or activities) to achieve the goals. Below is a summary of the proposed strategies and to which goals the strategies are linked.

	Strategies	Environmental Stewardship	Increase reliability	Lower Energy Costs	Job and industry creation	Consumer energy awareness
Supply side	Increase renewable energy generation	x	x	x	x	
	Diversify fuel sources by considering other fossil fuel sources	x	x	x		
	Leverage growing waste stream for energy generation	x			x	x
	Improve supply side competition			x		
	Conduct integrated long-term energy planning of resource needs		x	x		
	Improve supply-side energy efficiency	x		x		
Demand side	Develop a comprehensive portfolio of end-use energy efficiency programs	x		x	x	x
	Encourage distributed renewable generation resources	x	x		x	x
Cross-sector	Develop a comprehensive transportation plan		x		x	x
	Launch energy awareness and outreach				x	x
	Expand workforce and private sector in energy services				x	
Infrastructure	Establishment of an independent energy regulator		x	x		
	Improve transmission and distribution efficiency	x		x		
	Modernizing the grid through smart grid initiatives				x	x
	Improve resilience of the energy infrastructure		x			

BVI has already set preliminary targets and initiated steps to achieve them. The energy plan aims to coordinate existing targets and steps with future actions to advance the Energy Policy. Once the action items are set, BVI will provide an implementation plan that describes specific steps to achieve the goals with actions tied to an over-arching strategy.

The following sections describe supply-side, demand-side, cross-sector, and infrastructure strategies and actions.

Supply-Side Strategies

Currently, BVIEC’s power supply is mainly provided by Wärtsilä’s reciprocating generation sets that run on light fuel oil at Pockwood Pond on Tortola. The electricity distribution system on Tortola is extended via submarine cables to Virgin Gorda, Jost Van Dyke and seven other smaller islands. Anegada has its own power station that provides 24-hour service.

The main strategies for the supply side aim at reducing dependence on imported oil by increasing the availability and use of alternative fuel sources (such as renewable energy) and conducting long-term planning of resource needs; and improving supply-side competition.

5.1. Strategy: Increase renewable energy generation

Increasing renewable energy will achieve many of BVI's energy goals: environmental stewardship by choosing sustainable lower emission fuels, increase reliability by diversifying and decentralizing supply, and lower costs in the long term by eliminating fuel costs. In addition, by shifting generation from imported fuel oil production to local natural resources, new industry and jobs are created locally.

Recognizing the importance of renewable energy in BVI's energy future, the Government has already set goals to supply 30% of the territory's energy by renewable means by 2023, including up to 6 MW of wind, 2.5 MW of solar, 1.5 MW of energy from waste, and 1 MW of sea wave or other resources. Under a Renewable Energy Strategy Project, BVIEC has conducted a renewable pre-feasibility study on solar photovoltaic (PV) and waste-to-energy, a solar request for proposals (RFP) was published and bids were received, a solar and light-emitting diode (LED) streetlight RFP was published and bids were received, a transmission system study was conducted to analyze the integration of renewables, and a pre-feasibility assessment for a renewable hybrid system in Anegada was studied.

All of the above projects remain in progress, with BVIEC in various stages of land control, bidder and engineering/procurement/construction (EPC) contractor selection, and feasibility studies. The solar RFP and solar and LED Street lighting campaigns are the most advanced, with bids received and BVIEC in active discussions with bidders.

Actions:

- BVIEC will remain in active discussions with solar and solar/LED street lighting bidders to advance bids to the contracting stage.
- Revisit renewable energy goals every 3 years. The goals were set in 2013 as part of the 10-year energy vision. As renewable energy technologies rapidly change and new technologies likely become more affordable and effective, it is prudent to revisit the renewable energy goals periodically to ensure the island optimizes its renewables potential.
- Determine and publish the amount of renewable energy that can be cost-effectively integrated into the grid while maintaining reliability, efficiency, and environmental integrity.
- Develop licensing requirements and procedures for renewable energy facilities to ensure they minimize environmental impacts.
- Promote incentives for renewable energy projects that create local employment by requiring a minimum amount supplied by local contractors.
- Consider establishing a feed-in tariff for distributed generation resources. A well-designed feed-in tariff—at a pre-determined price — can provide stability and predictability for a nascent industry to flourish. However, it needs balance against the mandate for the utility to provide least-cost electricity service.
- Consider a review of Import Tariff duties to incentivize an increase in renewable energy generation.

5.2. Strategy: Diversify fuel sources by considering other fossil fuel sources

BVI's energy supply is highly dependent on imported oil for power generation, direct heating end use, commercial/industrial applications, residential cooking, and the transportation sector. Concentrating energy use in imported refined petroleum products can produce volatile fuel costs. Many islands are considering the introduction of liquid natural gas (LNG) and/or liquefied petroleum gas (LPG) and compressed natural gas (CNG). By diversifying fuel sources other than renewables, BVI can further increase security of supply, and hedge against price volatility of a single fuel. In addition, certain alternative fuels can reduce emissions and lower the potential of oil spills and contaminants in fuels handling. Given capital costs for infrastructure required to use alternative fuels (such as pipelines, terminals and handling) and the uncertainty of contracting, the utility (BVIEC) should continue to examine cost effective alternative fuels.

Actions:

- BVIEC will continue to track and update plans for alternative fuels used for electricity generation.
- To support awareness of other fuel alternatives, consider tracking and reporting the consumption of fossil fuels in each energy sector.
Disseminate information to BVI stakeholders on the advantages and risks of switching to alternative fuels.

5.3. Strategy: Leverage growing waste stream for energy generation

The BVI has seen a three-fold increase in waste volumes over the last decade with waste within the Territory being either landfilled or incinerated. Four unlined landfill sites are currently in operation (Tortola, Virgin Gorda, Jost Van Dyke and Anegada) with open burning a common practice. Because of the BVI's size and rolling terrain, landfill engineering is difficult and expensive.

Creating a waste-to-energy program requires significant infrastructure upgrades to collect and separate different types of wastes. Currently, trash collection service is limited; each district representative is tasked with hiring private contractors to collect and dispose of solid waste. Residents are expected to deposit their waste in metal dumpsters that are situated every mile or so, on the roadsides. There are currently no recycling facilities in place, though plans are underway to develop a viable recycling system for the BVI.

Actions:

- Continue to study the potential, cost-benefit and barriers of waste-to-energy generation technologies.
- Propose a minimum target for recycling.
- Expand recycling programs and create recycling plants on the main islands for the collection, classification and storage for export
- Report on air emissions and water pollution by sector to establish baselines for comparing programs.
- Create an inspection group to monitor air emissions and water pollution.

5.4. Strategy: Improve supply side competition

The legal framework for introducing supply-side competition is already in place. Independent Power Producers (IPP) for renewable energy projects can now deliver electricity according to a Power Purchase Agreement (PPA) with BVIEC. By providing transparency and certainty to the procurement process, BVI will be able to attract more bids and competition for its solicitations.

Actions:

- Develop IPP bid ranking procedures for IPPs to incorporate adjustments for more reliable resources, lower environmental footprint, more efficient use of existing assets, and higher local content.
- Coordinate adoption of renewables with distribution and transmission infrastructure to ensure that infrastructure costs are allocated fairly to all parties.
- Revisit fuel clauses in the tariff to include BVI's full portfolio of resources. To ensure the supply side competition is sustainable, BVIEC must be allowed to recoup the costs for procuring alternative resources. Currently, to allow BVIEC to cover all costs of generation, the base rate is supplemented by a fuel clause with a monthly adjustment follows the actual fuel price. This fuel adjustment is specifically limited to diesel fuel only. If BVIEC's fuel mix contains energy sources other than diesel fuel, such as, renewable energy sources, the costs of these would not currently be captured in the fuel clause. The current fuel clause mechanism needs to be updated to allow non-diesel sources in the energy mix and assure financial neutrality for BVIEC.

5.5. Strategy: Conduct integrated energy long-term planning of resource needs

As energy demand and generation technology changes, BVI should make plans to add or retire resources while balancing cost, reliability, environmental impact, efficiency of supply chain, and utilization of local resources. An integrated energy resource planning effort forecasts demand, identifies potential resource options, and determines an appropriate mix of resources for the Territory.

Actions:

- Establish an integrated energy resource planning program. Based on impacts resulting from BVI's energy strategies and expected policies, the study will consider forecasted load, existing resources, need for new resources, and energy infrastructure to determine the most favorable mix of energy resources for the planning years. The plan would optimize a least-cost production portfolio, while ensuring other policy objectives such as reliability, efficiency of supply chain, utilization of local resources and environmental stewardship.
- Conduct periodic reserve margin studies as part of the integrated resource planning to ensure reliability in future scenarios with higher intermittent resources.
- Review incentives and funding mechanisms to support energy initiatives.

5.6. Strategy: Improve supply-side energy efficiency

To optimize the assets BVIEC already has, the utility should pursue improving supply-side energy efficiency. The supply chain includes production and imports, fuels handling and storage, and consumption.

Actions:

- Review the potential of dispatching generating units more economically to improve generation efficiency and reduce losses.
- Introduce a GIS based asset management program to extend the life of assets reliably.
- Determine if energy storage terminals are effectively meeting demand for fuels with respect to location, deliveries, fuel spillage and usage.

Demand-side strategies

The Government has made several advances in customer-side energy strategies. The Government has led the initiative of replacing traditional incandescent and compact florescent lights with LEDs in Government buildings. It is also replacing traditional streetlights with solar and LED streetlights. BVI customers will be incentivized to install solar water heaters in residential homes and businesses. The goal of the following customer strategies is to further empower customers to reduce their energy bills by demand-side management programs and self-generation programs. The customer-side strategies have to work to balance the supply-side efforts and provide flexibility.

5.7. Strategy: Develop a comprehensive portfolio of end use energy efficiency programs

Energy efficiency programs tend to be more cost-effective and less capital intensive than supply-side programs. The biggest challenges for demand-side programs are to build consumer awareness, overcome financing costs, encourage availability of efficient equipment, deliver program delivery infrastructure, and develop import infrastructure for energy efficient equipment.

Actions:

- Continue with the bidder selection process and contracting in the solar and LED street lighting RFP and campaign begun in 2015.
- Address “low hanging fruit” by promoting efficient streetlights, efficient residential and business lighting systems, efficient refrigeration, second refrigerator turn-ins², and efficient cooling, considering a combination of options, including appliance efficiency and environmental standards³, and energy labeling, and building codes.
- Conduct study of energy efficiency potential with assumptions on technologies that may become available, program adoption, and savings.
- Establish energy efficiency goals.

² Promote turn-ins of refrigerators when new ones are purchased to prevent old, inefficient units from remaining in use.

³ For example, banning HCFC refrigerants

- Define cost effectiveness of energy efficiency against the avoided cost of new generation.
- Conduct load studies for different sectors to help understand consumption patterns and therefore the cost-effectiveness of applying certain energy efficiency measures.
- Design incentive mechanisms to encourage energy efficiency, such as tax and import incentives and rebates for direct measures.
- Develop an energy audit program, especially for sectors that consume the most electricity.
- Consider adopting new appliance labeling and standards. Determine the cost-benefits, as well as barriers for adopting such a program.
- Study (via pilot programs) and consider adopting building energy efficiency benchmarks and standards to confirm and ensure efficiency savings for new buildings. This can include requirements for insulation, air-conditioning equipment, refrigeration, lighting, water heaters, and self-generation equipment.
- Continue consumer awareness campaign to promote the energy programs.

5.8. Strategy: Encourage distributed renewable generation resources

Distributed generation resources have benefits for customers and the overall grid. The most common form is small PV systems installed on rooftops at residential or business locations. For customers, distributed generation at their homes or businesses can reduce their energy bill. For the grid, they provide greater efficiency because they are closer to load, minimizing distribution losses; also, small energy resources spread across the grid provide greater reliability and resiliency against disasters. BVIIEC has already started to implement solar street lighting, and is contemplating net billing programs which allow customers to generate their own power and feed unused excess power back into the grid.

Although the cost of solar has decreased significantly in the past decade, the relatively high upfront capital cost is still a challenge. In other countries, the combination of tax credits, rebates, net-metering programs, and innovative financial mechanisms such as lease and property-linked financing, have been able to bring the upfront costs down – in some cases to zero. This requires a robust solar industry and regulation support. Also, similar to energy efficiency programs, customer education is a key part to making distributed renewables a success.

Actions:

- Design a cost-effective self-generation program, such as tax incentives and attractive financing, to shorten the customer’s payback. The program could include features to encourage energy efficiency and installation guidelines to maximize production during peak loads.
- Explore the feasibility of a community renewables program for residents or businesses who do not have roof access or suitable roofs for solar installation.
- Establish and update installation guidelines, equipment standards, and vendor licensing to ensure consistent quality and safety of installations.
- Establish a simple interconnection process.

- Conduct distributed resource planning that includes grid studies. As PV increases on the distribution grid, it will be necessary to conduct distribution studies to understand interconnection risks.
- Launch consumer awareness campaign to promote the self-generation programs.

Cross-sector strategies

5.9. Strategy: Develop a comprehensive transportation plan

Transportation is a major sector in energy use and a major carbon emitter. Since BVI is a main tourism destination and its economy depends on tourism, it is important to reduce energy use in transportation without sacrificing convenience and reliability. BVI transportation sector is diverse and includes 2-wheeled and 4-wheeled forms of ground transportation, maritime transportation (including ferries, the yachting sector and other recreational boats and shipping), and air transportation. Like the power sector, the transportation sector depends on imported fossil fuel which is vulnerable to price fluctuations and disruptions. A comprehensive transportation plan needs to be developed to address the topics of fuel diversification, fuel efficiency, public transportation, and fleet management.

Actions:

- Study of fuel diversification, for example introducing natural gas. If alternative fuel is deemed feasible, there needs to be an implementation plan to develop alternate fuel supply infrastructure.
- Study the feasibility, suitability (given performance vs. terrain factors), cost and benefits of promoting hybrid and electric cars. The economics of plug-in hybrid and electric cars depend on stable and low electricity rate options. Although hybrid and electric cars would improve overall fuel use efficiency and diversify fuel sources, plug-in hybrids and electric vehicles would not significantly reduce carbon emissions as long as BVI's electricity generation mix is mostly carbon-based, so options for non-fossil charging stations (e.g. solar) should be encouraged. The study needs to account for future electricity rates (e.g. off-peak rates for charging), fuel mix of the power sector, costs of building out a charging infrastructure, as well as the impact of electric vehicles on the electric grid.
- Establish fuel efficiency standards for ground, maritime, and air transport.
- Establish emissions requirements for vehicles to prevent the import of old cars that do not pass emissions requirements in other countries and/or periodic emissions checks on existing vehicles. Policy considerations could include limiting the age of vehicles imported to BVI, or requiring imported vehicles to pass an emissions test prior to purchase.
- Study the options for efficient fleet management. The study should include a survey or focus groups of organizations with fleets to determine the feasibility of alternative fuel fleets and carpooling. For example, if conversion to electric vehicles is justified, BVI should identify fleets that could have centralized infrastructure: postal, other deliveries, school bus, taxis, minibuses, public buses (when available). Vehicle conversion should be considered concurrently with

public transportation planning, including use of PV, supplemented with batteries, for charging to avoid use of fossil fuel from the electric grid, especially during peak conditions.

- Surveys of consumers and businesses, especially those operating fleets, should be conducted to understand the feasibility of alternative modes of ground transportation, e.g. public transportation, walking, biking. The surveys would aim to understand:
 - How people travel to work, their hours, and method;
 - Whether they would take public transportation or car pools; and
 - Their needs for reducing use of cars (e.g. bike lanes, public transport, flexible hours, telecommute).
- Consider fuel tax in the ground, maritime, and air transportation to reduce use and provide revenue to fund alternatives.
- Consider smart land use, such as walkable neighborhoods, to enable low or zero carbon transportation, and reduce traffic concerns.
- Study public/private partnership model for delivering financially sustainable public bus transportation system. Public transportation with alternate fuels should be considered concurrently because alternative fuel fleets could be designed, with centralized charging or refueling.

5.10.Strategy: Enhance energy awareness and outreach campaign

A key component to a successful energy future is the participation of end users. Demand-side management programs, including energy efficiency, conservation, and distributed generation programs, all require a strong level of customer awareness and knowledge. One of the key barriers to consumer energy programs is the lack of knowledge and access to information about new and existing energy technologies. Due to the unfamiliarity, residents and businesses perceive technical and operational risks of implementing these energy projects.

There would be upfront costs to enhance and further develop the programs and expand community outreach. The public awareness campaign should maximize the use of a multi-pronged approach that includes direct mail, social media, program branding, partnerships with local businesses, and promotional events. The campaign should be long-term and consistent to ensure enduring behavioral change.

Actions:

- Review the existing campaign and enhance it to be all encompassing of the end users and establish long-term and persistent approaches.
- Conduct customer surveys and focus groups to benchmark current customer awareness, as well as barriers to adopting conservation, energy efficiency, and renewable energy systems.
- Create and implement a public relations campaign to address energy and environmental issues and to introduce energy and environmental initiatives such as conservation, energy efficiency, self-generation programs, and carbon footprint reporting.

- Develop public information portals for customers to access information on fuel prices, energy saving tips, energy efficient measures, renewable energy devices, carbon footprint/emissions reports, and the Territories' status towards its energy goals.

5.11.Strategy: Expand workforce and private sector in energy services

For BVI to create a sustainable energy future, it requires local capacity for energy services, vendors, and workshops that can support new energy needs. Currently, there is limited availability of energy saving and renewable technologies. The Territory often depends on technical experts from abroad. A sustainable energy landscape would require a robust energy sector that has an abundance of energy equipment vendors that sells a variety of energy technologies, financial services that can offer loans to businesses and residents for energy projects, energy services companies that can install, maintain, operate and service energy equipment, as well as a knowledgeable workforce which can support energy projects.

Actions:

- Encourage local entrepreneurs to start businesses to support the procurement, development, financing, and operation of new energy technologies through training, tax incentives, and funding and technical assistance partners⁴.
- Partner with H. Lavity Stoutt Community College (HLSCC) to offer appropriate hands-on training in energy efficiency, conservation, and renewable energy, including a curriculum for all schools⁵.
- Periodically collect and publish energy data to equip the private sector with information necessary to do business in BVI.

Infrastructure strategies

BVIEC is a publicly-owned utility. BVIEC owns and manages the Territory's generation, transmission, and distribution, and is regulated under the Government's Ministry of Communications and Works. The current regulatory and physical infrastructure was developed based on a simple model when BVI had less than 2000 customers. As population and demand grew, as renewable generation increases, and as new market entrants emerge in the power sector, the goal of infrastructure strategies is to develop a physical and regulatory infrastructure that can accommodate the next generation of technologies and policies. Strategies include establishing an independent regulator, modernizing the grid through smart grid initiatives, and developing a comprehensive transportation plan. In general, infrastructure strategies require high upfront costs, but have the potential to decrease costs in the long term.

⁴ For example, Association of the Overseas Countries and Territories' Territorial Strategies for Innovation provides technical assistance to Overseas Countries and Territories

⁵ This can be achieved as part of the SMART School initiative

5.12.Strategy: Establish an independent energy regulator

Regulation of the power sector by an independent regulator within a legally established regulatory framework has been introduced in many countries. The regulator (considered as a 'surrogate' for competition) is in charge of tariff determinations, regulation of the quality of supply as well as the quality of customer service, reviewing and approving the utility's strategic (typically 5-year) or integrated resource plans, reviewing applications of IPPs as received and reviewed by the utility, and advising the Minister on granting Licenses to IPPs, and other functions.

In general, a knowledgeable and independent regulatory body can incentivize an electric utility to go the extra mile toward higher efficiency, lower tariffs, higher reliability, and higher quality of service. An independent energy regulator better ensures utility balancing and contracting for IPPs and equal access to providers.

Actions:

- Assess the introduction of a new regulatory framework for the power sector. Since there are costs involved with establishing a regulatory body, the assessment should weigh the cost against its advantages.

5.13.Strategy: Improve transmission and distribution efficiency

Similar to supply-side efficiency, BVIEC should pursue improving the efficiency of existing transmission and distribution infrastructure to optimize the assets it already has.

Actions:

- Review the potential to reduce technical and non-technical losses in the transmission and distribution systems. The review will include benchmarking efficiencies of transmission and distribution systems with other regions in order to set targets for improvements
- Consider introducing an asset management and geographical information system program to extend the life of assets reliably, enable more accurate forecasting of loss reduction strategies, and better model technical effects of interconnecting Renewable Energy sources.

5.14.Strategy: Modernizing the grid through smart grid initiatives

Smart grids add computer-based remote control and automation monitoring, analysis, and communications throughout the electric delivery system. The technologies could span from distribution automation to smart meters. The goal of introducing a smart grid is to maximize the throughput of the system while increasing energy efficiency. For the utility, a smart grid can move electricity through the grid more reliably, efficiently, and economically; for consumers, smart grid can facilitate more efficient use of electricity to reduce energy costs. Smart grid implementation requires high capital costs, but for the right business cases, it could reduce costs through shifting major loads, such as dispatchable R.O. water production plants, to off-peak times thus reducing peak demand, lowering reserve requirements, or supporting customer energy efficiency programs, such as home energy management, home automation, and demand response.

Securing the future of the electricity grid from the vulnerabilities of cyberspace is a priority and will proactively employ antivirus tools, firewall protections, and security audits. The data storage and/or backup will be remotely secured at data centers both in the cloud and at different geographical locations, and to which there would be various levels of access controls and redundancy.

Actions:

- Conduct a business case to analyze the cost-benefit of a full-fledged smart grid program or a limited program featuring selected advantageous Smart applications.
- Align remote data storage centers with stringent security control and redundancy.

5.15.Strategy: Improve resilience of the energy infrastructure

As an island Territory, BVI is particularly vulnerable to climate changes due to its relative isolation, its sensitivity to weather changes, as well as the proximity of its critical infrastructure and economic activities to the coastline. Cost-effective adaptation options should be developed that balance climate risks and resilience of energy infrastructure. Currently, energy assets are all in the same physical location, which increases the risk of catastrophic failure from highly unlikely events such as an uncontrolled fire, tsunami, earthquake, terrorist attack, or plane crash. In addition, centralized generation requires more and less efficient transmission to achieve the same overall capacity and redundancy. A double failure of the transmission system or associated stations could lead to extended outages.

Actions:

- Prepare a feasibility report to investigate methods for reducing the risk of climate change as well as natural hazards to the operation of the utility. The report will detail risk profile, investment required, and recommended actions. The report will consider the following:
 - Identifying energy infrastructure (e.g. fuel terminals, generation site, transmission and distribution system, and their supporting infrastructure) that is vulnerable to disasters and assessing the costs and benefits of climate-proofing the infrastructure;
 - Increasing distributed energy resources (described in more details in the next section); and
 - Establishing an alternative site for generation and/or storage. An alternative location may increase fuel alternatives and reduce transport costs, reduce line losses on parts of the system and provide diversity in case of unlikely events.
- Test and update safety measures and disaster contingency plans for energy facilities.
- Evaluate joining island interconnection initiatives. Identify whether the BVIEC could benefit from an inter-island cable connection, such as with the US Virgin Islands. Evaluate the potential risk of the inter-island cable connection. Before initiating a cable connection study, the costs and benefits for both VIWAPA and BVIEC should be assessed.



2016 GOVERNMENT OF THE VIRGIN ISLANDS