IN PURSUIT OF REGIONAL ENERGY SECURITY

ESTIMATED READ TIME: 8 MINUTES

ON THE GREEN AGENDA

KEY TAKEAWAYS

Energy security refers to the uninterrupted availability of energy sources at an affordable price.

Factors undermining regional energy security include high dependency on imported fuels, weather events and investment roadblocks.

Diversification of the energy mix, development of regional resources, installation of more climate-resilient energy infrastructure and enabling policy environments can all help address current challenges.

> Positively for our region, the necessary conversations around energy security are happening. Recognition of the threats is an important precursor to adequate preparation. If current momentum can be sustained, we can make welcome progress towards building a more secure energy future.

In 2022, following the Russian invasion of Ukraine, the disruption of energy supply chains in Europe triggered a continental scramble to find alternatives to Russian oil and gas. The resultant tightening of energy supply, logistical challenges and soaring prices have undermined European energy security. This has been a particularly destabilising consequence of the war - you cannot produce and feed, sustain and grow, defend and rebuild without a secure supply of energy.

Caribbean and Latin American territories have noted the European crisis and begun to assess their own energy needs and vulnerabilities, asking the question – are we energy secure?

With this topic now a pressing matter on the regional political agenda, it is important that we understand the goal we are pursuing. What exactly is energy security and what are the challenges we must overcome to achieve it?

WHAT IS **ENERGY SECURITY?**

The International Energy Agency (IEA) defines energy security as the uninterrupted availability of energy sources at an affordable price.[1] Parsing this definition, we can pull out three conditions for energy security. Firstly, there must be enough supply to meet demand (availability). Secondly, that supply must be steady and reliable (uninterrupted). Thirdly, its cost must make it accessible to consumers (affordable price). Energy security is therefore impacted if anything stands in the way of those conditions being met.

These conditions also have a temporal dimension. Long-term energy security is bolstered when there are timely investments that ensure future supply stability. On the other hand, short-term security is achieved when energy systems are adequately equipped to react to any sudden changes in the supply-demand balance.[2]

[1] https://www.iea.org/topics/energy-security
[2] Ibid

WHAT **THREATENS** OUR ENERGY SECURITY?

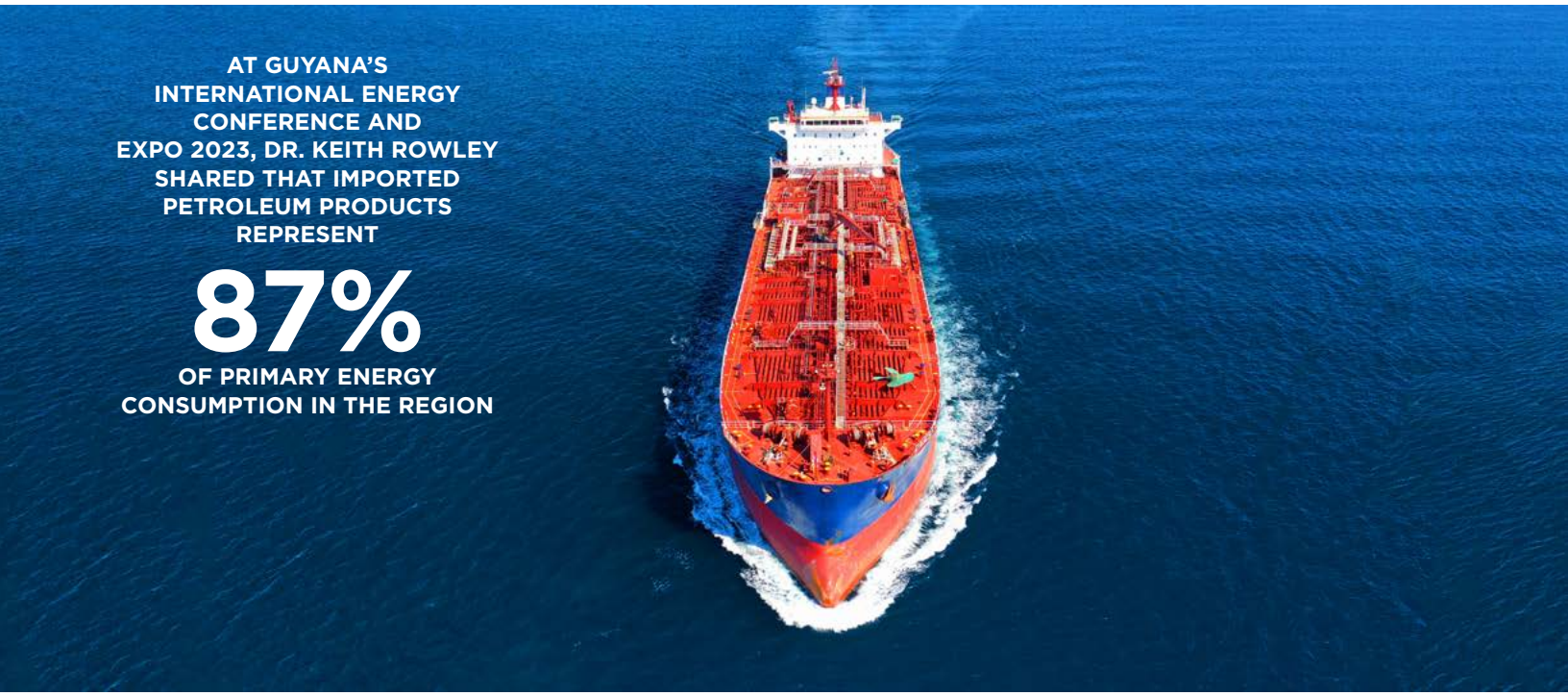
In the Caribbean and Latin America, there are several factors that weaken our energy security.

Dependence on imported fuels

At present, many Caribbean islands still depend heavily on imported crude for power and transportation. In fact, in his address at Guyana's International Energy Conference and Expo 2023, Trinidad and Tobago's Prime Minister Dr. Keith Rowley shared that imported petroleum products represent 87% of primary energy consumption in the region.[3] Small wonder, then, that according to World Bank data, the Caribbean collectively has the highest dependency on imported energy in the Western Hemisphere.[4] The greater part of that energy comes from North and South American sources, although a percentage of the market is supplied by European, Asian and African producers.[5]

This dependency impacts the region's short-term energy security. Heavy reliance on external suppliers, coupled with insufficient domestic supply/capacity to meet demand, puts countries at the mercy of the market. Anything that impacts the source of supply – be it supply chain failures, policy changes, trade embargoes or geopolitical developments – will in turn impact the importer's ability to meet its energy needs. Even when countries have sufficient buffer in the form of multiple supply sources, there is still a risk of interruption. Challenges along logistics routes due to weather events, accidents or even acts of terror could hinder the timely and safe delivery of energy commodities to their destinations.

Importation of fuels also has implications for the cost of energy. Caribbean consumers pay the highest electricity rates in the Western Hemisphere - prices are on average four times higher than in the United States, in large part because of the dominance of imported fuels.[6] Moreover, as price-takers, regional energy importers must absorb any surges in market prices, such as those that have occurred due to the COVID-19 pandemic and the Russia-Ukraine war. Except where they are offset by transfers and subsidies, higher purchase costs for fuels on the international market are passed along to consumers. More expensive energy inflates prices and drives up the overall cost of living.



[3] https://guardian.co.tt/news/the-prime-ministers-speech-at-guyanas-international-energy-conference--expo-6.2.1633618.f2ed9444f7
[4] https://www.csis.org/analysis/reimagining-us-strategy-caribbean
[5] https://wits.worldbank.org/CountryProfile/en/Country/LCN/Year/2020/TradeFlow/Import/Partner/all/Product/27-27_Fuels
[6] https://www.csis.org/analysis/reimagining-us-strategy-caribbean

ON THE GREEN AGENDA

Energy infrastructure is vulnerable to extremes of weather.

Weather events

In recent years, Latin American and Caribbean territories have begun to increase investment in renewable energy technologies. Of the energy sources being harnessed, solar, wind and hydropower are most prevalent. However, the infrastructure used in these systems is vulnerable to extremes of weather.

For example, wind turbines currently on the market were not designed to withstand the force of Category 5 hurricane winds.[7] Although some innovators are working to address this, existing wind farms in the Caribbean are at risk, considering the increased frequency and intensity of hurricanes.

Severe storms can also damage solar arrays. In the wake of Hurricanes Irma, Harvey and Maria in 2017, some solar systems in Puerto Rico, the US Virgin Islands and Barbuda were destroyed by winds and debris.[8] System failures were linked to installation methods and site-specific conditions.

Hydropower plants, which leverage flowing water, can be impacted by changes to the hydrological cycle due to global warming. According to the IEA, "the increased probability of extreme precipitation events such as heavy rainfall, floods and droughts across the world...will increase risks to hydropower generation by altering water availability, increasing sediments, or causing physical damages to assets."[9] For Latin America in particular, which generates almost half its electricity using hydropower, these risks can pose a significant threat to energy security.

It is worth noting that renewable systems are not the only energy infrastructure that can be compromised by weather. Storms and hurricanes often cause electricity failures, as winds and floods damage power lines. After Hurricane Maria levelled transmission and distribution infrastructure in Puerto Rico and the US Virgin Islands in 2017, some citizens had no grid power supply for months, in what is documented as the longest blackout in US history.[10] As hurricanes become more prevalent and severe, the region could experience more frequent grid disruptions.

Investment

As mentioned before, long-term energy security hinges on timely investment in future sources of supply. If the region hopes to achieve a degree of energy independence

[7] https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017GL073537
[8] https://rmi.org/wp-content/uploads/2018/06/Islands_SolarUnderStorm_Report_digitalJune122018.pdf
[9] https://iea.blob.core.windows.net/assets/8fa86b9d-470c-41a6-982e-70acd3fbdda4/ClimateImpactsonLatinAmericanHydropower_WEB.pdf
[10] https://edition.cnn.com/2018/04/16/us/puerto-rico-blackout-second-largest-globally-trnd/index.html

UNDER THE CARIBBEAN SUSTAINABLE ENERGY ROADMAP AND STRATEGY, THE REGION IS TARGETING A RENEWABLE ENERGY ELECTRICITY PENETRATION OF

47%

BY 2027 BUT AN ANNUAL INVESTMENT OF US$1.2 BILLION WILL BE NEEDED TO ACHIEVE THIS GOAL.

in the near future, there needs to be heavy investment in renewables today. As it stands, Aruba, Dominica, the Dominican Republic and Jamaica are among a small handful of countries where renewables account for more than 10 percent of the energy mix.[11]

Under the Caribbean Sustainable Energy Roadmap and Strategy, the region is targeting a renewable energy electricity penetration of 47% by 2027.[12] However, the region is not on track to easily achieve this goal. An annual investment of US$1.2 billion – sixteen times the current investment level - will be needed.[13]

The Caribbean Development Bank believes financing for this investment will likely need to be provided by the private sector, since Caribbean governments tend to have heavy debt loads that make it difficult for them to obtain new loans, even from multilateral agencies.[14] However, as the World Bank notes, the relatively small scale of investments in many Caribbean countries often makes transaction costs for private financiers prohibitively high.[15] The lack of clearly elaborated clean energy policies, regulations and incentives can also deter investors, who need to be sure of their returns.

HOW CAN **WE BECOME MORE ENERGY SECURE?**

So how do we address some of these challenges and build our short and long-term energy security?

High on the agenda should be accelerating progress toward greater self-sufficiency in energy. This includes developing regional hydrocarbon resources to help supply the market. Looking within the region for energy supplies – at Trinidad and Tobago, Guyana and Suriname, for example – can mitigate the supply chain and logistics risks associated with importing fuels from distant locations. This is one of the drivers behind NGC's focus on micro-LNG, and its exploration of opportunities to supply Caribbean territories. It is also a factor underpinning recent calls by regional leaders for the Caribbean to be allowed to pursue development of its resources.

At the same time, it is understood that we need to diversify our region's energy mix and increase our installed capacity in renewable energy. The region has enormous potential in this area. The challenge is, of course, ensuring that any new capacity installed is climate resilient.

Innovation will be key in this regard. One of the Caribbean Development Bank's proposals is to install climate resilient rooftops, which can generate electricity and withstand extreme weather events, in 75% of homes in the region by 2035.[16]

[11] https://www.caribank.org/newsroom/news-and-events/speeches/keynote-energy-transition-caribbean-challenges-and-opportunities
[12] https://www.ccreee.org/our-work/policy-implementation/
[13] https://www.caribank.org/newsroom/news-and-events/speeches/keynote-energy-transition-caribbean-challenges-and-opportunities
[14] https://www.reuters.com/business/energy/caribbean-must-speed-renewable-energy-transition-manage-oil-shocks-official-says-2022-04-27/
[15] https://blogs.worldbank.org/latinamerica/clean-energy-caribbean-triple-win
[16] https://www.caribank.org/newsroom/news-and-events/speeches/keynote-energy-transition-caribbean-challenges-and-opportunities

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Decentralised systems which allow for more independent power producers to supply the grid, can further build resilience by creating a distributed power generation base - akin to sharing one's eggs among multiple baskets.

Achieving this goal will however require collaboration between private and public sector actors. Learning from others is also important. After hurricane Ian battered Florida in 2022, many communities were left without power, but lights in one solar-powered town remained on.[17] Case studies such as these offer insight into what conditions or physical setups contribute to more resilient renewable energy infrastructure.

Decentralised systems which allow for more independent power producers to supply the grid, can further build resilience by creating a distributed power generation base - akin to sharing one's eggs among multiple baskets. Since renewable energy setups are modular and standalone, failure in one part of the grid need not impact the whole. Appropriate legislative frameworks and feed-in tariffs will be needed to help build these distributed power generation systems.

Importantly, governments have a responsibility to create enabling environments, to encourage all the investment that must happen if the region is to become more energy secure. Regional collaboration could be key, as a combined market has more purchasing power and allows for economies of scale, while standardisation of certain regulations and processes can significantly improve the ease of doing business. All of these can make the region more attractive to investors.

POSITIVE STEPS

Positively for our region, the necessary conversations around energy security are happening. Recognition of the threats is an important precursor to adequate preparation. If current momentum can be sustained, we can make welcome progress towards building a more secure energy future. ■

[17] https://edition.cnn.com/2022/10/02/us/solar-babcock-ranch-florida-hurricane-ian-climate/index.html