

Is there a Roadmap for Regional Energy Cooperation and Energy Transition for the Southern Caribbean Energy Matrix?

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Panelist

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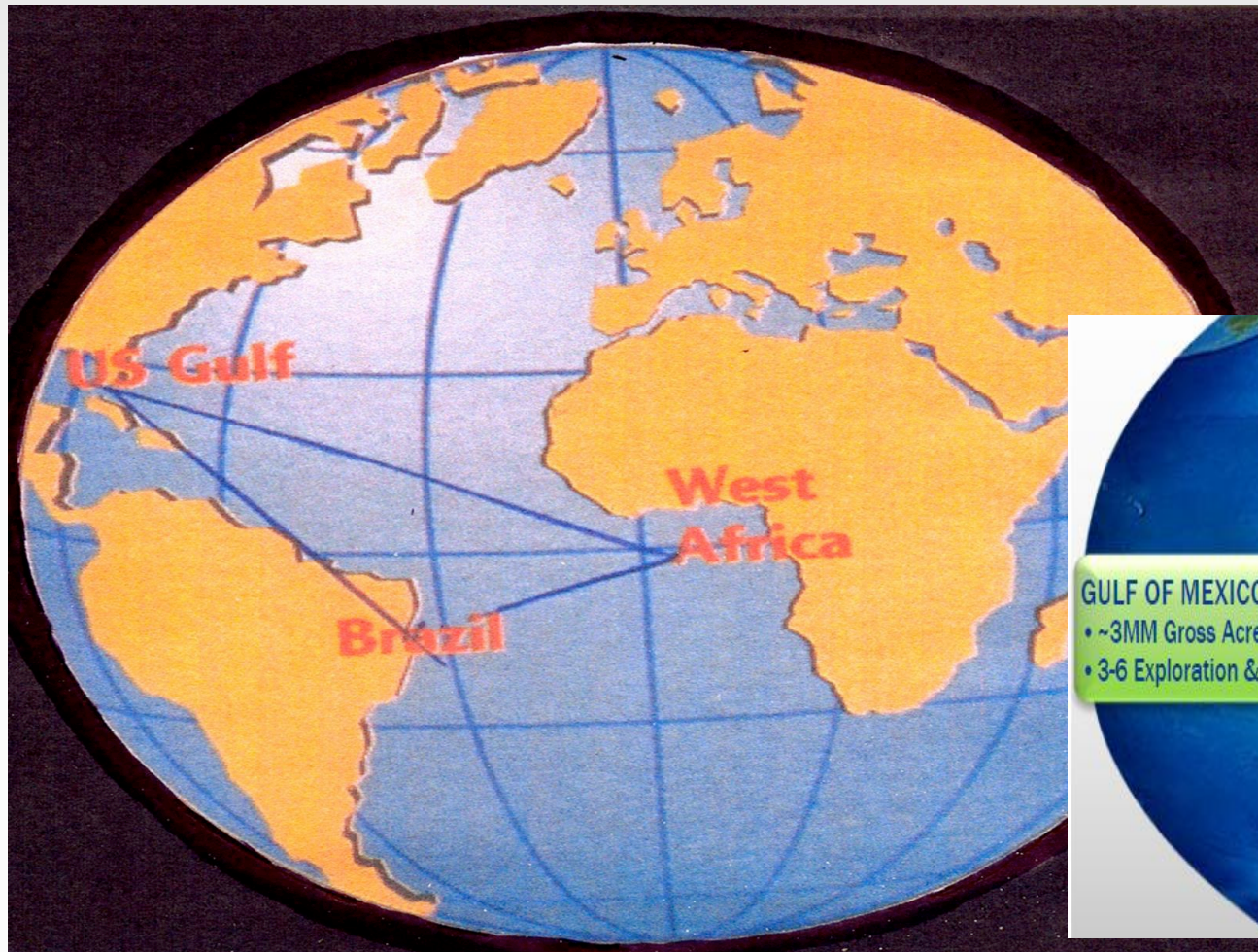
Outline

- Overview of the Southern Caribbean Energy Matrix
- Potential of the Guyana-Suriname Basin (GSB)
- Transition from Fossil Fuels to Renewable Energy
- Renewable Energy Opportunities
- Conclusions



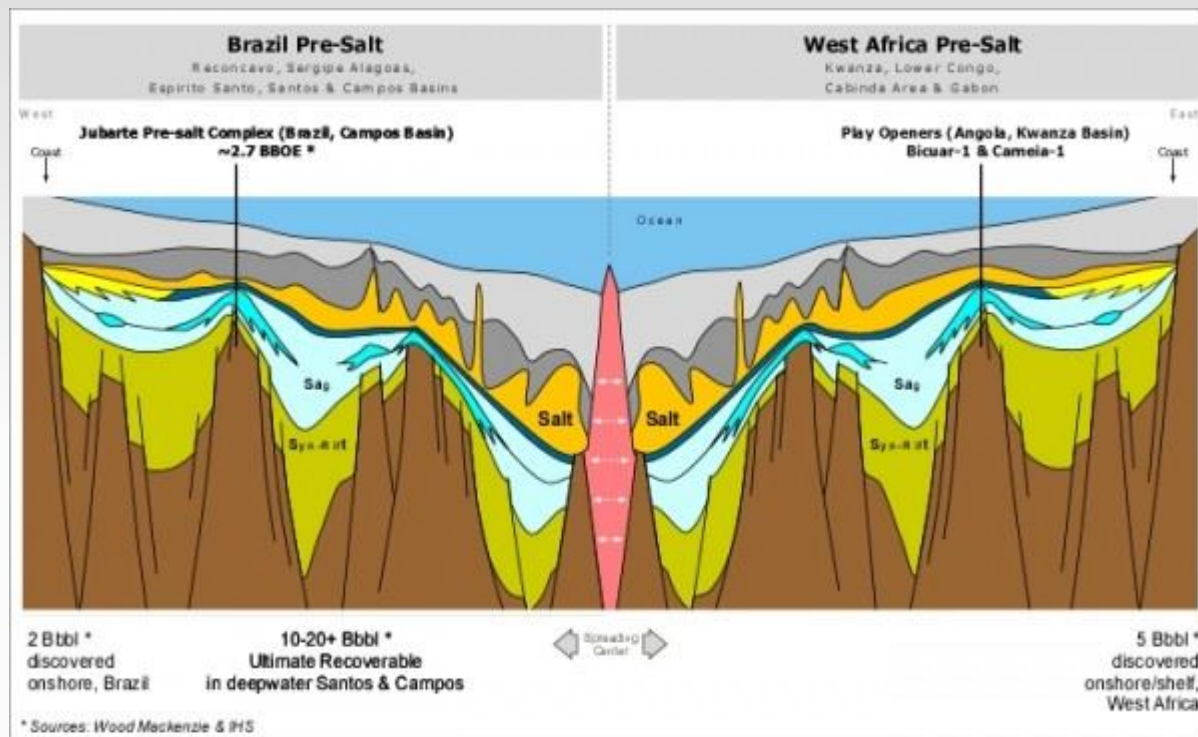
**Picture adapted from Transocean Ltd.*

The golden triangle for Deepwater O&G exploration: The Gulf of Mexico-Southern Caribbean and West Africa



Brazil's subsalt oil fields -a major crude exporter with sales around 2 million barrels per day (Mb/d) by 2022

Ghana's oil rent income represented nearly 10 percent of the country's GDP in 2014



Mirror-image formation on the West African side of the Atlantic and analogous to the discoveries in Brazil's Santos Basin.

Brazilian deepwater resources are expected to contribute 11 Mb/d of new non-OPEC oil supply versus 7 Mb/d for OPEC by 2035.

Southern Caribbean O&G Reserves

Country	Oil Reserves (Billion Oil-Equivalent Barrels)	Gas Reserves Trillion Cubic Feet (tcf)
Guyana	11* Producing 380,000 bpd 1.3 million bpd by 2027	17*
Suriname	3.5*	
Trinidad & Tobago	455.3 million* and 3.2#	10*, 23.2! and 55.2#; Producing 2.8 bcf

* Established reserves

! Technically recoverable

Prospective

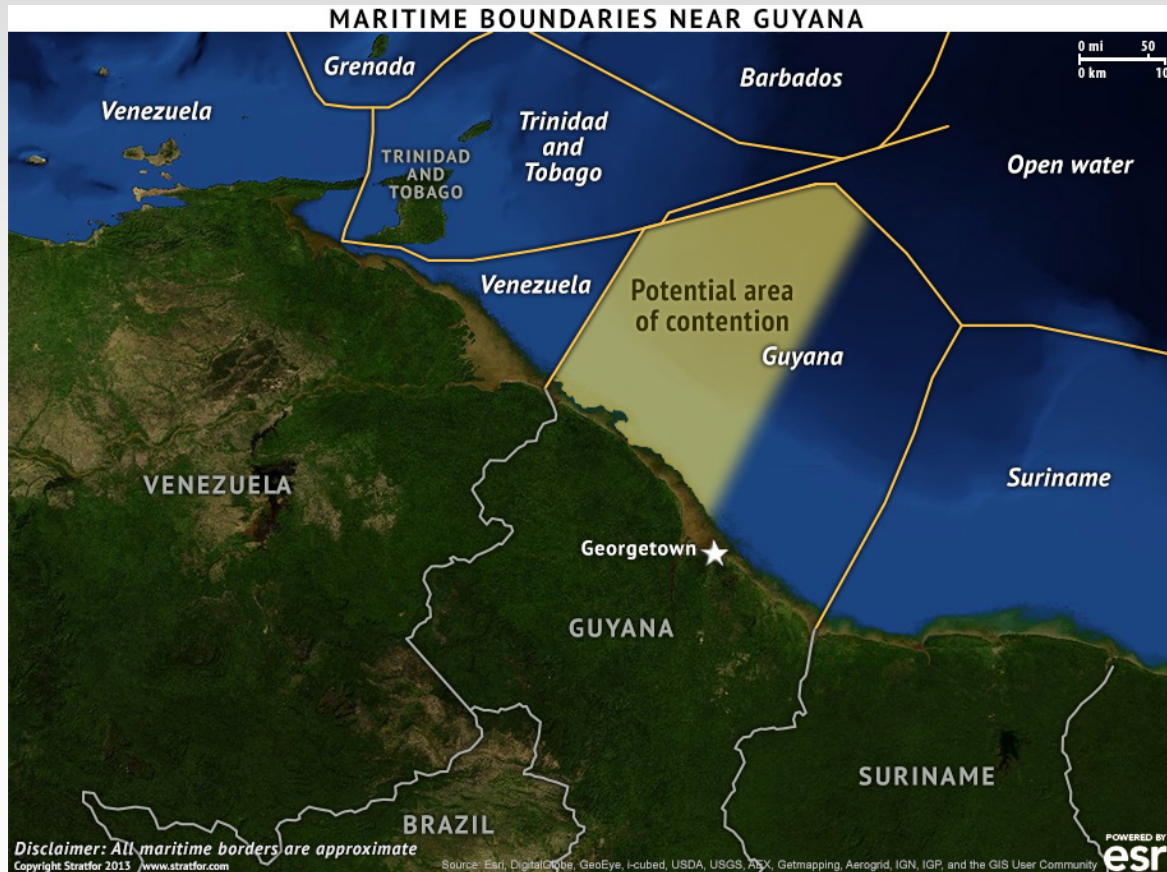
➤ Guyana-Surinam Basin ~16 Gbbl; ~32 tcf¹

<https://oilnow.gy/featured/guyana-suriname-basin-ranked-2nd-most-prospective-in-the-world-for-oil/>

Territorial Disputes

Venezuela - Trinidad

Guyana - Venezuela



Governments and regulators on both sides will have to agree on how to manage common Resources via Unitization.

Fossil fuels and the Climate Pledge

NET-ZERO CARBON BY 2050?

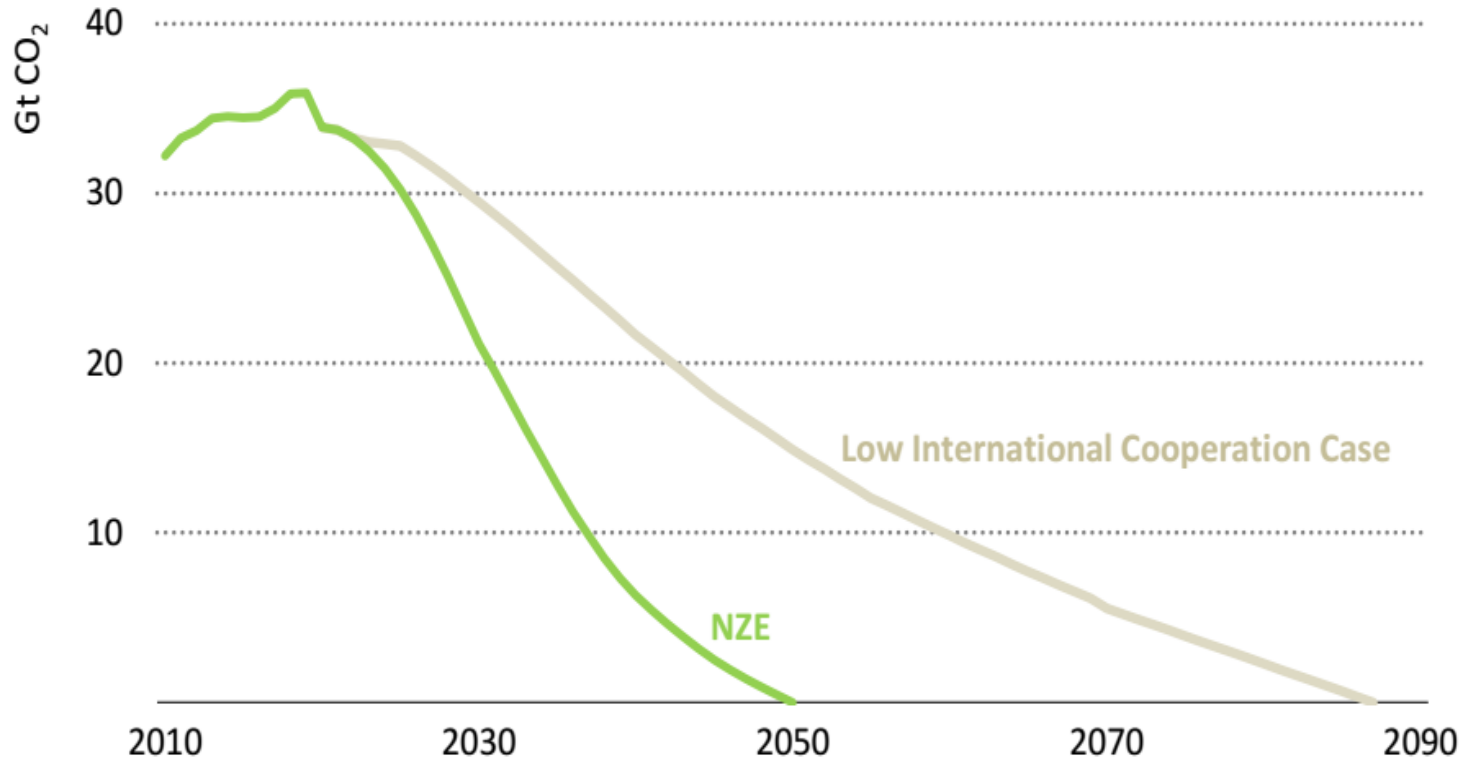
How will we get there?

“PetroCARICOM” versus Resuscitation of PetroCarribe

- ❖ Trinidad and Tobago (T&T) Energy Minister Stuart Young proposed a Caribbean energy alliance involving Guyana, Suriname
- ❖ Use the resources derived from oil
- ❖ Move to renewables (hydro, solar, wind, etc.)
- ❖ Investments in renewable energy have a very high Internal Rate of Return on Investment (IRRI).
- ❖ Implement adaptation measures across all vulnerable sectors of the economies.
- ❖ Requires Governments, businesses, investors and citizens working together utilizing affordable and reliable arrangement under the CARICOM umbrella.

Fossil fuels and the Climate Pledge

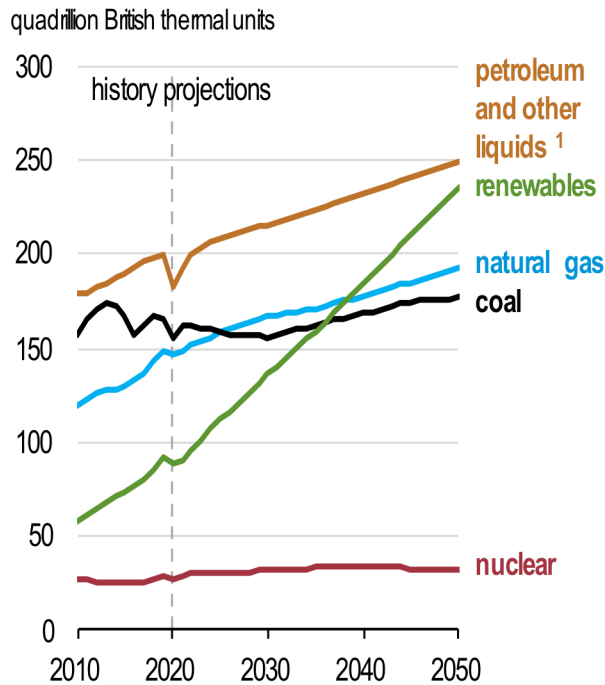
Global energy-related CO₂ emissions in the net zero pathway and Low International Co-operation Case



Note: Gt = gigatonnes.

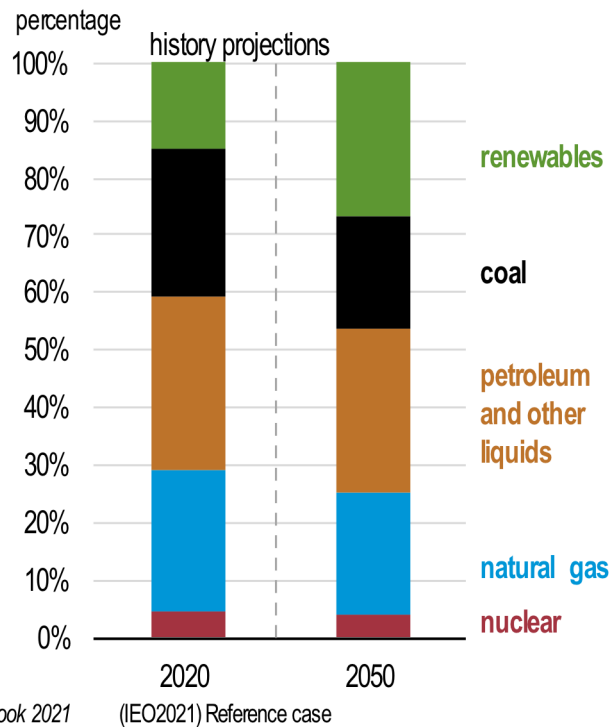
Fossil fuels and the Climate Pledge

Primary energy consumption by energy source, world

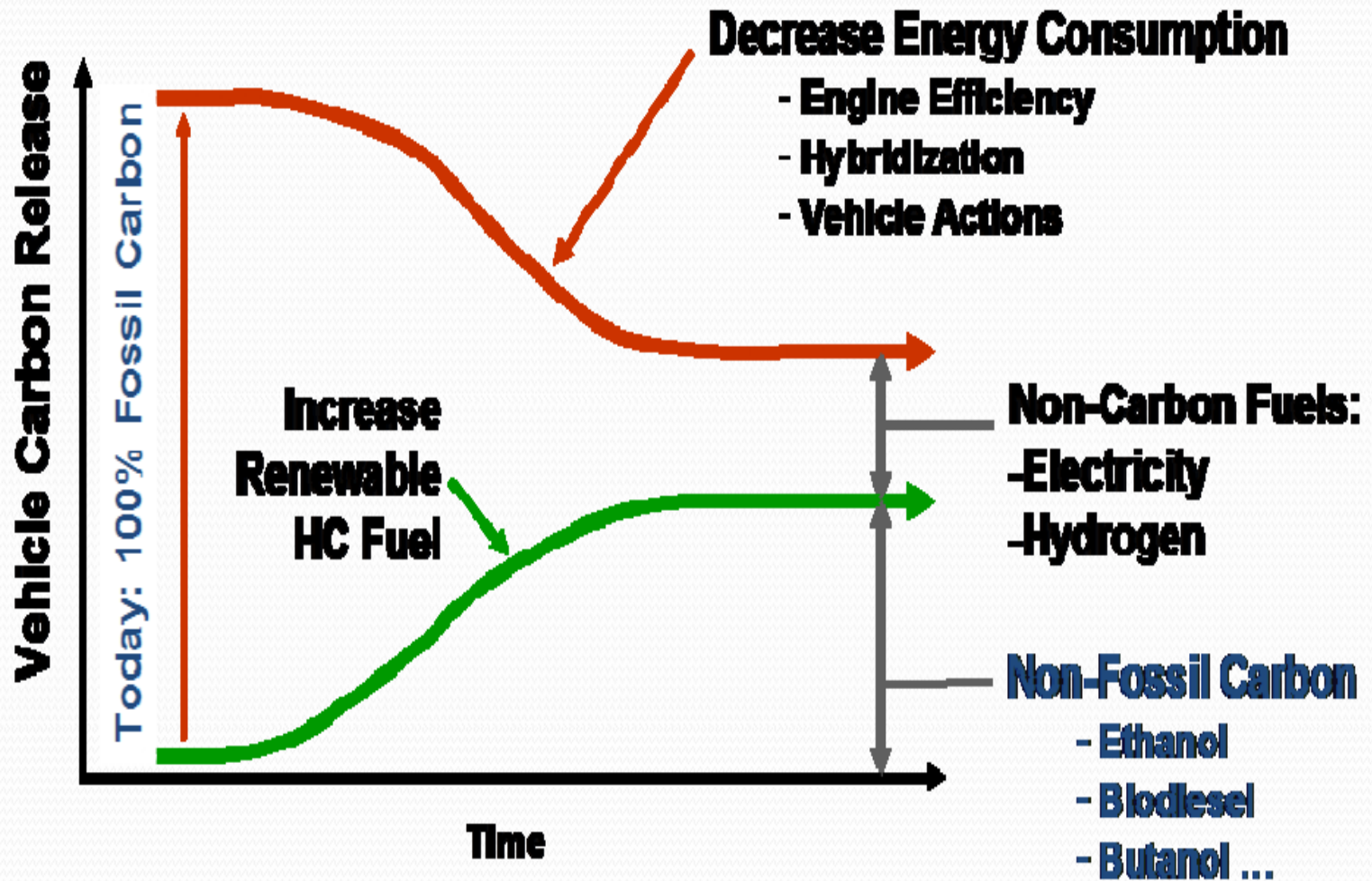


Source: U.S. Energy Information Administration, *International Energy Outlook 2021*
¹ includes biofuels

Share of primary energy consumption by source, world

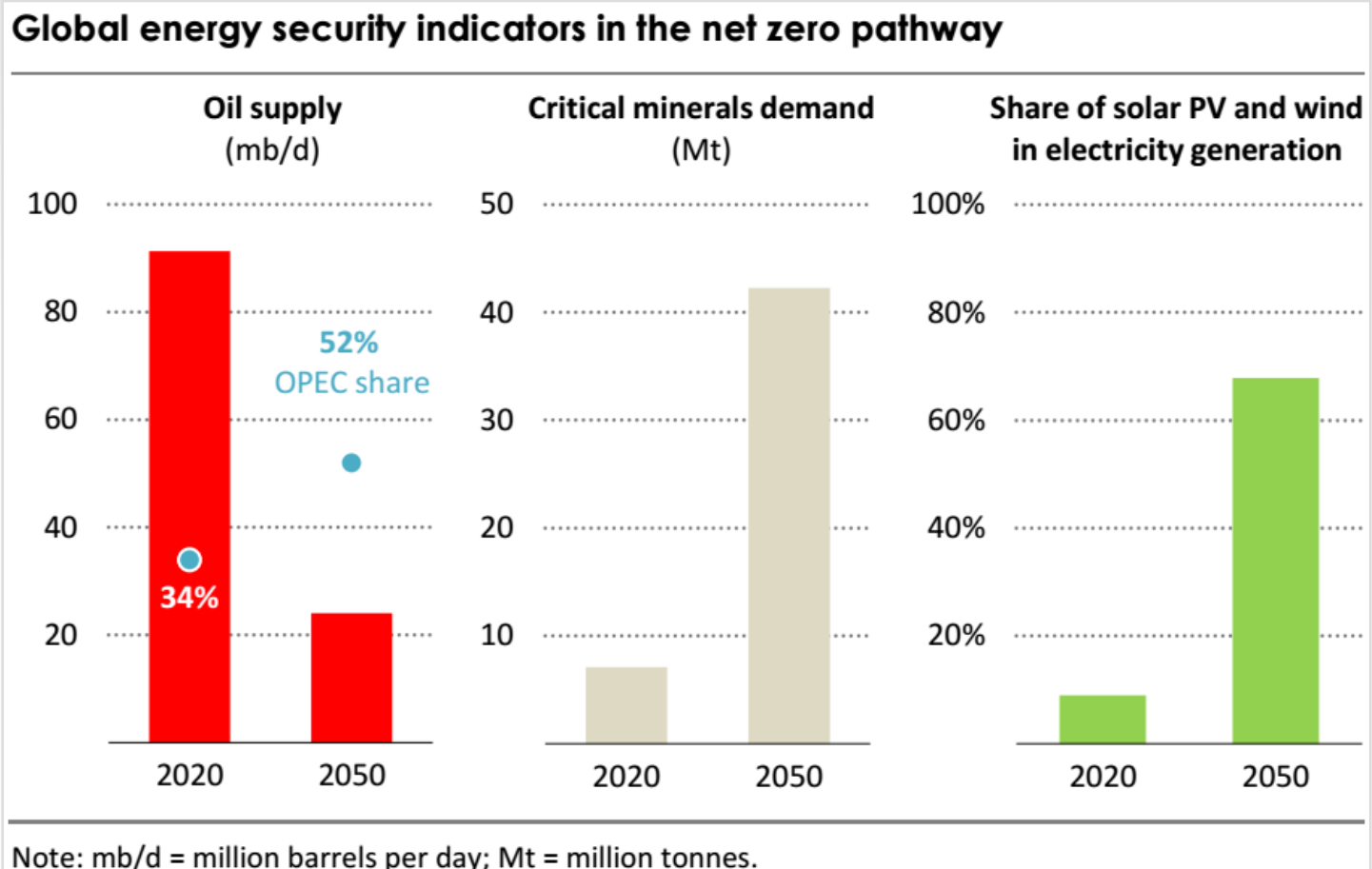


Path to CO₂-neutral Transportation



What realistic combinations of fuels and vehicle technologies can drive net CO₂ emission from light-duty transportation to zero?

Fossil fuels and the Climate Pledge



Alternative Renewable Energy

- It tends to be **minimal pollution** in comparison to the use of fossil fuels (especially coal and oil).
- It tends to come from **sources that are free.**



From left: Wind turbines generate electricity, solar panels convert sunlight into electricity, geothermal plant utilise underground heat.

Renewable energy sources can provide comparable energy production and heating.

Regional Industrial Development

- ❖ Global demand for ammonia and fertilizers – a driver for collaboration
- ❖ T&T is offering its 10 ammonia plants, 7 methanol plants, and 4 LNG facilities to process natural gas
- ❖ Hydrogen* production by catalytic pyrolysis of natural gas and electrolysis of water using renewable energy
- ❖ By-products of graphene or carbon nanotubes can be used in production of cost-effective photovoltaic cells
- ❖ Other by-products include biochar and ammonia
- ❖ Added value products from minerals such as aluminum from bauxite, semi-conductors and solar panels from quartz, lithium from Spodumene, 99.99 gold, etc.

*H₂ from renewable energy costs about \$5/kg but projected to cost \$1 per 1 kilogram in 1 decade ("1 1 1"). Industry has projected a potential \$2.5 trillion global market for hydrogen technologies by 2050 [1].

CONCLUSION

Regional cooperation between Guyana, Suriname must entail usage of the resources derived from oil to develop renewables (hydro, solar, wind, etc.) while at the same time adopting adaptation measures across all vulnerable sectors of the economies. This would require Governments, businesses, investors and citizens working together. CARICOM Single Market and Economy (CSME) could be used as the framework to facilitate intra-regional investment and business opportunities. We have trained engineers, technicians, and graduates in the Caribbean and diaspora who can design, build, inspect and maintain power systems and the supporting technology for the natural gas industry. In the words of Neville Trotz, “the regional energy cooperation between Trinidad & Tobago, Guyana and Suriname can demonstrate one way in which poor developing countries can face the paradox of being a fossil fuel producer and at the same time espouse the tenets of the Paris agreement and the global imperative to achieve a zero-carbon world by 2050”.

References

1. U.S. Department of Energy, “Hydrogen Shot,”
<https://www.energy.gov/eere/fuelcells/hydrogen-shot>. Hydrogen Council. November 2017. “Hydrogen Scaling Up. A Sustainable Pathway for the Global Energy Transition.”
<https://hydrogencouncil.com/wpcontent/uploads/2017/11/Hydrogen-scaling-up-Hydrogen-Council.pdf>.
2. Nevil Trotz, “Oil, Guyana and Climate Change – Quo vadis”
Parts I and II

Researchers hypothesize that the addition of a recalcitrant, C-rich soil amendment will improve soil health and promote greater productivity resulting in measurable soil C accumulation in multiple soil C pools with varying transit times. Biochar amended soil is expected to generate significantly greater warming benefits than unamended soil as calculated by Climate Benefit Sequestration (CBS) in units of radiative forcing ($W m^{-2}$) on any given timeframe.

More meaningful climate benefits will come only when the amount of warming avoided while C is sequestered in ecosystems is correctly accounted for. The metrics of carbon sequestration (CS) and climate benefit of sequestration (CBS) assess the contribution of simultaneous emissions and uptake from C reservoirs on radiative forcing (Sierra et al. 2021; Sierra and Crow 2021).