



EU Technical Assistance Facility for the Sustainable Energy for All Initiative (SE4ALL)

“Providing Technical Support to EU Delegation to Trinidad and Tobago to organise and implement the Clean Energy Conference aiming at providing EU Expertise in the field of Sustainable Energy”



Sustainable Energy Roadmap 2021-2030

Background

Despite Trinidad & Tobago’s (T&T) long lasting reliance on fossil fuels and engagement in high energy consumption patterns, there is a clear commitment to diversify into Renewable Energy Sources (RES), Energy Efficiency (EE) and decrease GHG emissions in various economic sectors. This commitment is condensed in ambitious, but fully achievable renewable energy and environmental targets:

- Target for 10% of electricity generation coming from RES by 2021.
- Target for reduction of GHG emissions from the power generation, transportation and industrial sectors by 15% compared to business as usual (BAU) by 2030.

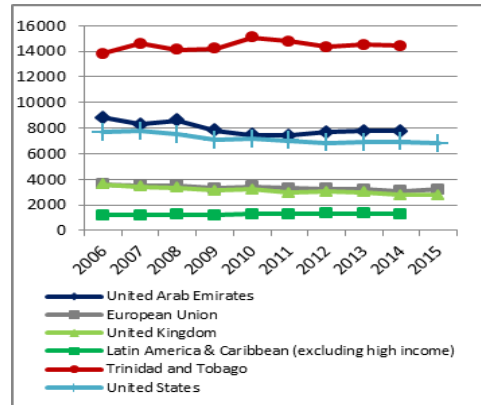


Figure 1 - Energy use for selected counties (kg of oil equivalent per capita)

The European Union, via its Technical Assistance Facility (TAF) for the Sustainable Energy for All (SE4All) Initiative has been offering technical support to the Ministry of Energy and Energy Industries on the development of the Sustainable Energy Roadmap 2021-2030 and its respective Implementation Plan.

Long-term energy sector requirements

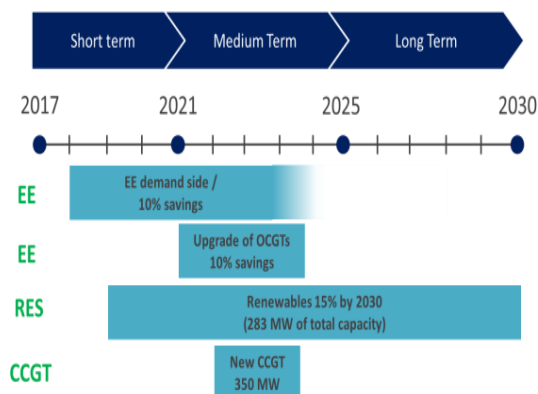


Figure 2 - Overview of proposed RES and EE targets till 2030

The analysis has indicated that, after 2019, new generation capacity will have to gradually enter the system, while after 2022-2023 significant new capacity will be required to cover project demand. A new Combined Cycle Gas Turbine (CCGT) plant of 300-350 MW might be required between 2022 and 2023, given constantly increasing electricity demand.

The policy scenarios assessed, including various energy mixes, indicate that conservatively at least 15% RES in the power generation mix by 2030 - equivalent to 283MW of installed capacity - is both cost-efficient and fully achievable. In total, an energy reduction potential of 20%, both from the demand and generation sides, is fully achievable. The aforementioned RES and EE potentials could be also gradually formalized as declared policy targets.

Optimum RES mix to achieve targets

The optimum RES mix comprises roughly 70% PV, 20% wind and 10% waste to energy. More specifically:



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- Utility scale PV is highly competitive and constitutes the largest part of the RES mix;
- Wind Energy is a cost effective technology for T&T in general;
- Waste-to-Energy appears to be an expensive technology, but not when seen as part of a wider waste management strategy;
- Residential and small scale PV is more expensive; however, it increases awareness and engages people.

Required actions and policies to promote renewable energy investments

Feed-in Tariffs (including net-metering) should be limited to small and medium-scale PV applications (e.g. up to 200 kW for PV) and for technologies that require support to enter the market. For large-scale RE investments (>2MW) the introduction of tendering processes is a more appropriate solution as they can lead to lower contracted tariffs.

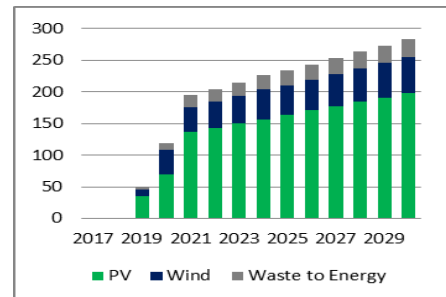


Figure 3 - Required installed RES capacity to achieve the proposed 15% RES by 2030 (MW)

Table 1 – Proposed investment attraction instruments by type of technology

Technology/Class	Auctions	Feed in Tariffs	Duty exemptions	Capital subsidies
PV utility scale (>2MW)	✓		✓	
PV small scale (5kW>, <200kW)		✓	✓	
PV residential (<5kW)		✓	✓	
Wind	✓		✓	
Waste to Energy	✓		✓	

To achieve the RES targets, a wide portfolio of policy, legal and regulatory, institutional, capacity building activities are required; the most important of which are shown below.

Table 2 – Overview of proposed key government actions needed to achieve RES targets

Category	Description	Period
Resource Assessment	Assessment of wind resources (WRAP)	2018-2019
Policy	Review of electricity tariffs- Elaboration of tariff study	S1 2018
Institutional	Establishment of an Energy Agency	2018
	Establishment of a RES/EE Association	2018
Legal/Regulatory	Amendment of the T&TEC Act and the RIC Act	2017-2018
	Amendment/elaboration of Building Code	2017-2018
	Amendments in the Green Fund to finance RES & EE	2017-2018
Capacity Building	National Energy Planning and Strategy – LEAP model	2017-2018
Technical / Implementation	Elaboration of RES Grid impact study	2017
	Elaboration of RES tariff setting study	2017-2018
	Technical Assistance (legal & financial) for tendering process	2018
	Launch of 100-Roof PV Program	2018-2020
	Mandatory SWH for retrofitting of new social housing	2018-2021
	Completion of Grid Connection Requirements - Wiring Code	2018

An enormous potential for energy savings exists in T&T

A savings potential of approximately 10% in the demand side is a very conservative estimate. This potential should not be seen as uniform and its achievability should be more thoroughly assessed as it entails large behavioral change from consumers. In any case, the



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implementation of EE measures is both necessary and cost-efficient. Initial estimates of the overall CAPEX costs can be up to \$400 million USD from all sectors (residential, hotels, industrial), which could/should be partially financed by the government, as with the current electricity price levels incentives are limited.

The EE upgrades in the generation side can lead to significant fuel savings estimated at approximately 10% of annual consumption. Suitable support policy instruments for the promotion of EE are set out in the table below.

Table 3 – Policy instruments to support the promotion of energy efficiency

Technology/Class	Tax incentives	ESCOs/ EE Fund	Duty exemptions	Capital subsidies	Mandatory obligations
Residential	✓	✓	✓	✓	✓
Hotel	✓	✓	✓		✓
Industrial	✓	✓	✓		✓
Upgrade of OCGTs	✓	✓			

Similar to renewables, a wide portfolio of policy, legal and regulatory, institutional, capacity building activities are required to foster EE the most important of which are summarized in the table below.

Table 4 – Overview of key government actions needed to achieve EE targets

Category	Measure	Period
Resource Assessment	Large scale implementation of energy audits	2018 - 2030
	Feasibility study for the upgrade of OCGTs to CCGTs	2018
Policy	Adoption of binding EE targets with horizon to 2030 in the primary legislation	2018
Legal/ Regulatory	Development and Enactment of an EE Act	2018
	Implementation of secondary regulation for EE Act	2018-2019
	Standards for EE as well as labeling in electric home appliances	2018
	Monthly billing instead of bi-monthly electricity billing	2018
Technical/ Implementation	Incentives for the replacement of old air-conditioning systems	2018-2025
	Incentivize the replacement of incandescent light bulbs with LED	2018-2025
	Tax and financial incentives for EE appliances	2018-2025
	Completion of the certification system for ESCOs	2018
	Implementation of 150% tax allowance programme	2018-2030
	Establishment of an EE Fund	2018-2020
Awareness Raising	Awareness and information programmes for EE	2018-2030

Establishment of an EE Fund/EE utility mechanism

An EE Fund could be established which would be responsible for realizing and financing EE investments through a revolving mechanism utilizing the additional revenues from sales of natural gas. A variation of the EE Fund could be an option according to which a third party (an EE utility) could undertake the responsibility of technical and financial functions of the EE Fund. This utility could be also legally obliged to achieve certain annual EE targets that could be included in an EE Act.

Benefits from uptake of Renewables and Energy Efficiency

Large benefits can be realized from the uptake of renewable and energy efficiency in T&T - financial, growth and environmental benefits – including:

- Opportunity costs from natural gas utilization lying between \$1.6 and \$3.2 billion USD by 2030 could be gradually avoided leading to huge foreign exchange gains;



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- Large-scale uptake in the demand side (10% savings) can lead to savings of approximately 1 TWh;
- The promotion of RES and EE according to the prescribed targets could lead to investments of \$600 million USD and \$400 million USD respectively up to 2030;
- The large-scale uptake of RES and EE could lead up to 10.000 of direct and indirect new jobs throughout the total value chain of technologies;

Potential business opportunities for T&T

The deployment of large-scale RES and EE applications could create considerable business opportunities for the private sector, both domestically but also regionally. Its competitive advantages include:

- **Proximity with promising markets.** Trinidad has close proximity to attractive end-markets with positive outlooks, also suggesting that the country could position itself as a supplier of solar panels/SWH in growing markets like South American countries.
- **Low electricity costs.** Trinidad and Tobago offers a competitive cost advantage for the manufacture and supply of solar modules due to low electricity prices.
- **Networks and infrastructures.** The adequate availability of local ports for export of solar PV cells, especially at Pt. Lisas provides excellent exporting opportunities.
- **Availability of skilled labour.** Trinidad and Tobago has a pool of skilled labour in electronics, engineering, and project management.

Table 5 - Rough assessment of opportunities in the RES and EE value chain

Sector	Market player	2017-2021	2022-2025	2026-2030
RES	PV and SWH manufacturing cluster	✓	✓✓	✓✓✓
	Design firms	✓✓	✓✓✓	✓✓✓
	EPC contractors	✓	✓✓	✓✓
	Retailers of small scale PV and SWH	✓	✓	✓
	RES developers	✓✓	✓✓✓	✓✓✓
	O&G companies willing to invest	✓	✓✓	✓✓
EE	Instrumentation and automation	✓	✓✓	✓✓
	ESCOs	✓✓✓	✓✓✓	✓✓✓
	Facility management firms	✓	✓✓	✓✓
	Design and energy audit firms	✓✓✓	✓✓✓	✓✓✓
	Construction companies	✓✓	✓✓	✓✓
	Hotels and their associations	✓✓	✓✓	✓✓
	Energy intensive industries	✓✓	✓✓✓	✓✓✓
	Large consumers and conglomerates	✓	✓✓	✓✓
	Banks and accounting firms	✓	✓✓✓	✓✓✓
Manufacturers in the EE supply chain	✓✓✓	✓✓✓	✓✓✓	