



NATIONAL ENERGY POLICY CONSULTATIONS

RENEWABLE ENERGY POLICY

Re-fueling T&T's economic engine:
A new policy for energy, 2011-2015

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1. PREAMBLE

Trinidad and Tobago's petroleum resources have been and would continue to be the prime driver for the country's growth and development for some time into the future. On a national level, natural gas is now the primary energy source both for fuel and feedstock, whereas the transportation sector is almost completely dependent on petroleum products. Local energy demand for this finite resource is on the increase, making the issue of conservation a paramount concern. This could be reasonably addressed by utilization of the country's renewable resources, increasing energy efficiency, decreasing energy demand and the use of alternative energy in the transportation sector.

2. GLOBAL SCENARIO

Member countries of the United Nations Framework Convention on Climate Change (UNFCCC) of 1994 and the Kyoto Protocol of 1997 are committed to reducing their emissions by an average of 5% by 2012 against 1990 levels. The goal is to stabilize greenhouse gases at a level that will prevent dangerous human interference with the climate system, and in a timeframe that would allow ecosystems to adapt naturally so that it will not hamper food production and will allow sustainable economic development. Trinidad and Tobago is a ratified signatory to both the UNFCCC and the Kyoto Protocol.

While the extent to which different nations have introduced the use of RE varies, investment in RE has been significant and growing over the last decade on an international level. According to the United Nations Environment Programme and the Renewable Energy Policy Network for the 21st Century (REN21), renewables accounted for 60 per cent of newly installed capacity in Europe and more than 50 % in the USA in 2009. Experts predict that in 2010, the world as a whole will add more capacity to the electricity supply from renewable than non-renewable sources. Worldwide demand for solar energy is expected to nearly double between 2010 and 2013, reaching 19.3 gigawatts by the end of that period. In the case of wind energy, the World Wind Energy Association (WWEA) indicates that the market for new turbines reached 38 GW in 2009 and it is expected to reach about 40 GW in 2010 which would increase the global capacity to almost 200 GW by the end of 2010.

3. REGIONAL SCENARIO

In small island states of the Caribbean the threat of climate change is very real because of the serious negative socio-economic implications could result from an event such as rising sea levels. For these countries mitigation of climate change through promotion of energy efficiency and RE development are intertwined with economic development and promoting energy security through a reduction in the region's import dependency. Barbados has a well-

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established solar water heater industry and is in the process of establishing a photovoltaic industry. In Belize 44% of the country's 2008 electricity generation came from hydropower and this technology is also utilized in Dominica, St Vincent and the Grenadines and Jamaica. Wind energy is being utilized in: Curaçao with an installed capacity close to 12 MW, in Guadeloupe and Martinique with a capacity close to 2 MW, and more recently in Jamaica with approximately 21 MW of installed wind power generation and an expansion project is currently underway. Furthermore, several islands are conducting wind measurements and wind resource analyses to study the possibility of installing wind power generation systems. Geothermal energy has had a long history of usage in Guadeloupe and various projects are at various stages of development or were recently completed in Nevis, Dominica, Grenada, St Lucia, St Vincent and the Grenadines and Montserrat.

4. POLICY OBJECTIVE

Primary Objective

The primary objective of Renewable Energy (RE) policy measures for Trinidad and Tobago in the context of the country's National Energy Policy is to identify and examine strategies and make recommendations for introducing RE into the local energy mix.

Complementary Objective

It is essential that the RE policy measures promote energy efficiency and conservation as very important complementary elements of RE implementation to ensure its effectiveness.

5. POTENTIAL BENEFITS OF RE/EE TO TRINIDAD AND TOBAGO (STRENGTHS)

- GHG emission reduction;
- Mobilization of Financing;
- Energy Efficient Lifestyles;
- RE-based Electricity Generation for the national grid;
- National development including new business and employment opportunities; and
- Increase domestic export of petroleum products

6. RE/EE AND DOMESTIC SUSTAINABLE DEVELOPMENT (OPPORTUNITIES)

RE development and the promotion of EE would lead to significant national economic and social benefits while addressing key sustainable development goals:

1. Long term energy security;
2. Climate change mitigation; and
3. Extended life of non-renewable fossil fuel resources which could enhance petroleum product exports

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7. BARRIERS TO DOMESTIC RE AND EE DEVELOPMENT (THREATS/WEAKNESSES)

There are several **barriers** and practical limitations to be addressed in the implementation of RE sources in Trinidad and Tobago, which include:

- Subsidized Energy Product Prices
- Lack of Domestic Policy and Legal Framework
- High initial capital cost associated with RE, commercialization barriers, undeveloped market, and lack of fiscal incentives.
- Lack of Education and Awareness on the use and benefits of RE and EE.

8. RE AND EE POLICY IMPLEMENTATION STRATEGIES

In light of the foregoing there are four (4) critical elements for success of RE and EE strategies. . These elements are:

a) Recognizing the Inter-Relationship between RE and EE (and Conservation)

Promoting energy efficiency and conservation is critical to ensuring effectiveness of RE policy implementation. Reducing energy demand through increased conservation and efficiency and the resulting savings in the energy bill, could be a means to offset the additional cost of introducing RE technologies. It would also result in a reduction of the use of non-RE resources, thereby extending the lifespan of these resources.

b) Capacity Building and Awareness Creation

Capacity building and creation of public awareness are essential to effective execution of plans and programmes that seek to engage the nation. Strategies for building capacity and awareness include: training and education in RE and EE systems; Inclusion of RE and EE in education curricular; community based initiatives and advertising campaigns to promote RE and EE initiatives; Research and Development and standards and accreditation procedures; RE and EE grant and scholarship schemes; and, collaboration with international agencies to promote local RE and EE research and development

c) Creating an Enabling Environment

Government support through incentives and other mechanisms is critical to facilitating RE growth and development and the level and type of these incentives would depend on various factors including RE technology option and economics. This includes direct Government funding (e.g. the Green Fund) supported by facilitation of traditional and non-traditional financing (e.g. the Clean Development Mechanism (CDM) of the Kyoto Protocol); as well as creating the appropriate legal and regulatory environment.

d) Institutional Arrangement for Policy Implementation

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It is proposed that a Renewable Energy and Energy Efficiency Unit should be established in the Ministry of Energy and Energy Affairs to oversee the development, assessment, implementation and audit of energy efficiency and RE policies and programmes, as well as the continuous revision of such policies and programmes.

9. DEFINING THE SECTORS FOR RE POLICY IMPLEMENTATION

9.1 Electricity Generation

There are opportunities for utilization of RE for power generation to supply the national power grid.

RE options being considered to achieve this goal are wind energy, solar energy and ‘waste to energy’. {See Table below}

Wind energy has been identified as having the greatest potential for providing a supply to the local power grid over the short to medium term. This is because it is the most competitive in the local scenario compared with the existing consumer cost of electricity generated by combined cycle natural gas generation. In addition, the fact that wind farms could co-exist with agriculture is a major advantage compared with a traditional power generation plant.

This would require the undertaking of a wind resource assessment study in the first instance. Also, there is need to review and amend existing legislative and regulatory frameworks as necessary to incorporate RE development and usage; these include the T&TEC Act and Regulated Industries Commission (RIC) Acts and the issues involve ‘open access’ ‘net-metering’ and ‘feed-in tariffs’.

It is envisaged that the private sector would play an important role in these developments and their participation will be encouraged via fiscal incentives, such as removal of duties and 0 rating for VAT purposes on equipment.

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TABLE: Comparison of Electricity Generation Technologies

Pros: Wind	Pros: Solar	Pros: Waste to Energy
<ul style="list-style-type: none"> • Tried and tested technology globally for grid supply • Favourable geographic conditions e.g. NE Trade Winds, coastal plains • Competitive with natural gas for power generation • Wind energy could co-exist with and support agriculture 	<ul style="list-style-type: none"> • Tried and tested technology globally for grid supply • favourable geographic conditions • Stand -alone solar PV proven viable for off-grid remote regions 	<ul style="list-style-type: none"> • most technologies require a programme of waste segregation to be viable and so project could complement a waste management strategy
Cons: Wind	Cons: Solar	Cons: Waste to Energy
<ul style="list-style-type: none"> • High initial capital costs • Low penetration factor into national grid; • Variability of source so there is need for back up power • Land acreage requirement may limit size of plant 	<ul style="list-style-type: none"> • High initial capital costs • Low penetration factor into the national grid • Variability of source • Sizing of plant limited by land acreage needs (2 - 4 hectares per megawatt) • Not competitive locally with natural gas for power generation 	<ul style="list-style-type: none"> • Sustaining a viable project is dependent on volume of waste materials

9.2 Transportation

The development of a local biofuel (bio-ethanol and bio-diesel) industry would have a positive impact on long term energy security and sustainability. However there are limitations associated with commitment of land needed to produce biomass for fuel.

9.3 Short Term Implementation Strategies

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Opportunities for small scale, low cost applications of RE technologies are present in the residential, commercial and other institutional sectors. To facilitate and encourage these developments the Government has introduced the following measures :-

- Provision of fiscal incentives to encourage RE development and EE promotion including:
 - ✓ Tax credits for persons/businesses who purchase solar water heaters;
 - ✓ Import duty exemptions on RE equipment
 - ✓ 0-rated VAT on inputs used in the manufacture of solar water heaters and on Solar PV and wind equipment
 - ✓ Wear and tear allowances on wind turbines and equipment
 - ✓ Accelerated depreciation to energy auditors who acquire equipment for conduct of energy audits

The Government proposes to encourage participation by the national community in these efforts through:

- Using the Community Centers as venues or “Demonstration Centers” to implement RE technology and energy efficiency (EE) ;
- Demonstration of RE and EE through the education system (this would complement steps being made to include RE and EE in the curricular of schools, which was discussed above)

The Government proposes to lead by example through:

- RE and EE system installations and green building design in Government buildings, local housing programme, medical clinics and schools

These initiatives will demonstrate the use and benefits of RE and EE to the national community while facilitating the growth of a knowledge base and supporting the use of some of these venues as natural disaster relief shelters. The short term/readily implementable technologies/measures are:

Solar Water Heaters: This is well suited for implementation locally given that the electricity bill for water heating can account for nearly half of the total electricity bill of the typical residential customer.

Solar Photovoltaics: There may be opportunities for small scale applications of solar PV for off-grid supply to provide backup power for various uses e.g. small appliances, security lighting and emergency radio systems.

Energy Efficient Lighting: The replacement of incandescent light bulbs with efficient compact fluorescent models results in greater energy efficiency as the latter utilizes approximately 75% less power.

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Energy Labelling: Research has shown that the replacement of standard appliances with certified energy efficient products can result in significant energy savings which equates to a reduction in GHG emissions.

Green Buildings: New buildings could be constructed to save energy cost. The goal of these improvements should be to meet an internationally recognized standard for building efficiency e.g. Leadership in Energy and Environmental Design (LEED) green building certification.

10. CONCLUSION

Renewable energy could potentially play a significant role towards this country's economic security and environmental sustainability over the long term. The RE Policy measures should provide a framework for sensible decision making by the Government on matters involving RE and energy efficiency in Trinidad and Tobago as well as for educating the public and creating greater awareness. With the prudent application of financial incentives, capacity development and appropriate legislative, regulatory instruments, and institutional arrangements, an enabling environment can be developed to facilitate RE growth and development. Noteworthy however, is that practical solutions for improving energy efficiency are essential to complement RE programmes.

***Energy Research & Planning Division
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