

The Bahamas
National Energy Policy

November 2008

FIRST REPORT
OF THE
NATIONAL ENERGY
POLICY COMMITTEE

Disclaimer

This report reflects the outcome of deliberations by the members of the National Energy Policy Committee. The report does not set out the Government's policy but rather is an invitation for written submissions from the public and interested parties aimed at stimulating debate on a national energy strategy.

POLICY STATEMENT AND VISION

Recognizing the important role energy plays in the development of nations;

Recognizing further, that The Bahamas depends on imported petroleum products to satisfy over 99% of its consumer energy demand;

Acknowledging that the demand for electricity is projected to grow at an annual average rate of 8% over the next five years mainly due to large new private tourism investment projects, and electricity expansion costs will be high and financing a challenge¹;

Recognizing the reliance of the tourism, the hospitality sector and service industries on a constant and reliable electricity supply to enable them to be major contributors to employment and GDP growth;

Acknowledging the transportation sector consumes a large portion of total imported petroleum products and the important role transportation plays in The Bahamas as an archipelagic nation;

Understanding the need to ensure the best use of scarce energy resources in order to attain sustainable socio-economic development and improve the quality of life of the Bahamian people;

Understanding further, that our efforts to ensure the health and prosperity of our nation are unlikely to succeed if the country does not move immediately to achieve energy security and promote energy efficiency and conservation;

Recognizing that renewable energy technologies are a means to sustain vulnerable ecosystem services in The Bahamas as a Small Island Developing State as well as to meet national energy needs;

Understanding the need to ensure our economy can weather the volatility in the prices of traditional energy sources;

Recalling the commitment of The Bahamas to achieving the Millennium Development Goals, particularly Goal 7, Target 9 to integrate the principles of sustainable development into country policies and programs²;

Recognizing that reduction in the use of fossil fuels will enable The Bahamas to reduce its emissions of greenhouse gases as called for by the United Nations Framework Convention on Climate Change;

Acknowledging the significant financial and technical support that will be required to implement the National Energy Policy and its Implementation Strategy;

¹ Final Report: Development of a National Energy Policy for The Bahamas: Inter-American Development Bank

² Statement of the Right Honourable Prime Minister at the 63rd Session of the United Nations General Assembly.

Acknowledging also, that sustained effort is required, in light of volatility and reduction in oil prices, to not be detracted from the long term effort required to conserve energy and integrate alternate energy sources into national supplies;

Acknowledging further, the significant and very positive economic impact that can be achieved through the pursuit of emerging energy opportunities;

Recognizing that as a small island developing state with many islands, settlements and cays, that a wide variety of possible energy opportunities and solutions could be exploited, and the knowledge derived potentially exported;

The Government of the Commonwealth of The Bahamas is committed to the following National Energy Vision:

The Bahamas will become a world leader in the development and implementation of sustainable energy opportunities, by aggressively re-engineering our legislative, regulatory, and institutional frameworks; retooling our human resources; and implementing a diverse range of well researched and regulated, environmentally sensitive and sustainable energy programmes and initiatives, built upon our geographical (both proximity and diversity), climatic (sun, wind, and sea), and traditional economic strengths (tourism and banking).

BACKGROUND

Cabinet appointed the National Energy Policy Committee (NEPC) by conclusion ICO (08) 12th Meeting, Conclusion 20. The NEPC membership reflects the multi-stakeholder approach requested by Cabinet (see Annex 1).

The NEPC has held seven meetings, in addition to a working session. These events yielded interactive and productive discussions on energy and strategies for developing and implementing a national policy.

The NEPC members drew upon the final Inter-American Development Bank (IDB) report, the Washington International Renewable Energy Conference (WIREC) 2008 report, the national energy pledge³ made by The Bahamas at that conference, a report on renewable energy sources by Haley & Aldrich, as well as the Caribbean Renewable Energy Development Programme (CREDP) and national energy policies of Jamaica and Belize.

In addition to its appointed members, two resource persons have been identified who are providing the NEPC with expert input related to renewable energy and oil and gas resource potential in the Commonwealth. These resource persons informed the Committee on these matters, providing a local perspective on the IDB study.

The Committee also took advantage of the offer made by the IDB to make available to the Committee the author of their report and to provide an update based on recent trends and discussions related to an energy policy.

Ocean Engineering and Energy Systems (OCEES), an American engineering firm specialising in ocean thermal energy conversion (OTEC), also provided insight into the possibilities of this alternative form of energy use for electricity generation and district cooling systems.

The IDB in the continuation of its support to The Bahamas has developed, with input from the Bahamas Environment, Science and Technology Commission, two grant projects intended to support efforts of the NEPC to implement activities that will (1) support the reform of the energy sector; (2) fill data gaps identified by the initial report; and (3) undertake an assessment of the RE potential in The Bahamas. These projects are now in the early stages of implementation, and a detailed description of each is in Annex 4.

³ Full text of the pledge is found in Annex 3.

OVERVIEW OF THE BAHAMIAN ECONOMY

Table 1, The Bahamas - Selected Macroeconomic Indicators⁴

	2001	2002	2003	2004	2005	2006	2007
Real GDP (2006 prices) (B\$M):	6,393.8	6,524.8	6,368.9	6,358.8	6,571.1	6,875.6	7,066.2
Population ('000)	309	311.9	316.3	320.7	325.2	330.0	334.0
Total Labor force	164,675	167,980	173,795	176,330	178,705	180,255	186,105
Total Tourism Arrivals ('000s):	4,182.7	4,406.0	4,594.0	5,004.0	4,779.4	4,730.6	4,595.6
Air Arrivals ('000s):	1,428.1	1,402.9	1,429.0	1,450.3	1,514.5	1,491.6	1,486.3
Sea Arrivals ('000s):	2,754.5	3,003.1	3,165.1	3,552.7	3,264.9	3,239.0	3,109.3
Tourism expenditures (B\$M) estimated	1,647.7	1,759.8	1,757.3	1,884.5	2,068.9	2,056.4	2,187.2
Value of Oil Imports for local consumption (B\$'000)	273,233	290,191	284,268	365,452	523,952	708,177	802,165

The Bahamian Economy

The Commonwealth of The Bahamas (“The Bahamas”) comprises 700 islands and cays with a total land area of 5,383 square miles spread over 100,000 square miles. The total population of the country is 320,000 persons 69% of whom reside in New Providence, the capital city of Nassau; 16% reside in Grand Bahama, the second major center; and 15% is scattered among the other 28 inhabited islands.

Like other small island developing states, The Bahamas has a small economy that is disproportionately service-based. Expenditure on imported goods is extremely high, approximately five times the total value of exported goods. The largest sectors of the economy are tourism and financial services. Tourism, together with tourism-driven construction and manufacturing, accounts for approximately 60% of Gross Domestic Product (GDP) and directly or indirectly employs half of the archipelago’s labor force.

Financial services compose the second-most important sector of the Bahamian economy, accounting for approximately 15% of GDP and employing 4,253 persons. The majority of banks and trust companies are non-resident or offshore companies that generate no Bahamian dollar earnings and cover all their expenses for administrative cost, utilities, maintenance and other local overhead by bringing in foreign exchange (Dupuch, 2005).

Agriculture, fisheries and manufacturing together account for less than 10% of GDP. The Government has tried various economic incentives to increase the growth rate of the agricultural

⁴ Central Bank of The Bahamas, The Bahamas: Macroeconomic Indicators and Table 7.10 Value of Oil Imports for Local Consumption

sector; however, this sector is not increasing in value. In 2003, the sector was valued at approximately US\$51.78 million, a decrease of 5% from the 2002 estimate (Dupuch, 2005).

In 2004, the total fisheries landings were valued at US\$95.3 million (BEST, 2005). The commercially important marine fauna live on the shallow banks of Bahamian waters and include spiny lobster, queen conch and Nassau grouper.

Locally manufactured goods include arts and crafts, fabrics, paint and paper items, bottled water, beverages and pharmaceutical products. In 1997, manufacturing output totaled over US\$230 million (Dupuch, 2005). The leading manufactured item groups in The Bahamas are beverages and pharmaceutical products.

A comparison of the Central Bank oil imports for local consumption and the estimated tourism expenditures between 2001 and 2007 reveals that the percentage of funds repatriated to purchase oil for local consumption grew from 16.6 to 26.7 % over the period⁵. The value of oil imports grew from 273.3 to 802.2 million Bahamian Dollars over the seven year period. It is projected based on the first two quarters of 2008 that the total value of oil imported for local consumption is likely to exceed one billion Bahamian dollars.

Energy and the Bahamian Economy

Renewable energy sources or technologies represent a negligible contribution to the national energy mix. Two main players, the Bahamas Electricity Corporation (“BEC”) and the Freeport Power Company, supply virtually all the Commonwealth’s electricity needs. International and local oil companies supply the fuels and lubricants derived from fossil fuels used in the electricity and transport sector.

BEC, a wholly owned government public corporation, operates 29 generating plants (28 diesel engine stations and 1 gas turbine power station) with an installed capacity of 438 MW, providing service to approximately 93,000 customers. BEC’s area of supply extends to all of the major islands of The Bahamas with the exception of Grand Bahama and small private franchise holders exist throughout the smaller islands and cays.

For 2007, the generation statistics showed that heavy fuel oil was used to generate 68% of electricity and automotive diesel oil was used to generate 32% of electricity produced by BEC. BEC has a high dependence on fossil fuels as well as all other sectors of the Bahamian society. The Government of The Bahamas (“GoBH”) is focusing on supporting the use of alternative sources of energy (“RE”), promoting energy conservation, reducing oil imports and reducing emissions of greenhouse gases.

One constraint for the use of RE is that the current Electricity Act does not promote RE use in that it: (i) gives exclusive rights for the generation and sale of electricity to BEC or a franchiser, thus prohibiting self-generation and interconnection to BEC’s grid.; and (ii) does not impose a requirement that a certain percentage of its electricity be generated from alternate or “green”

⁵ The estimated total tourism expenditure and value of oil imported for local consumption for the period 2001 to 2007 as reported in the selected macroeconomic indicators in Table 1 of page 5 refers.

sources. As such, the legal and regulatory framework of the energy sector and fiscal incentives would need to be reviewed and amended before any investments for commercial applications. The present regulatory framework serves as a disincentive to private public partnerships in the expansion or development of the commonwealth's energy infrastructure.

The Grand Bahama Power Company Limited provides services on the island of Grand Bahama serving some 18,000 customers. Grand Bahama is the industrial center of the Bahamas as well as the main international container port facility. Its facilities consist of a 27,000 kW diesel plant, two gas turbines totaling 35,000 kW and a 75,000 kW steam plant. The total installed generating capacity in 2004 was 141,500 kW.

Given the price of oil, RE has become more economically competitive. Electricity companies in The Bahamas are considering using non-conventional (i.e., renewable) along with conventional energy sources as part of their expansion plan. It is hoped this will reduce the financial impact on operating costs of volatile oil prices, in addition to the positive benefits for the country in the areas of security of supply and lower, harmful emissions of greenhouse gases.

Currently BEC is operating under financial constraints. Some possible reasons for this include:

- 1) The policy of Government to have a single price structure across The Bahamas. BEC is profitable on New Providence but not on any other island.
- 2) The reduction in electricity tariff rate by Government.
- 3) The rapid increase in fuel cost that is out of proportion to the financial operating philosophy of BEC, and,
- 4) The imposition of excise tax on BEC's fuel imports

Public intervention has become necessary to offset the rising and increased cost to consumers in the lower economic brackets in 2008 because of rising fuel costs. Government intervention also has introduced a fuel surcharge cap to residential consumers as a direct result of the increased short term cost of oil in the international market.

GLOBAL AND NATIONAL OVERVIEWS ON ENERGY

The Global Energy Situation

Experts believe non-renewable energy sources will remain dominant in global energy production, with renewable sources accounting for less than 5% for decades to come. It is generally held that oil reserves are dwindling, while oil prices have become volatile and expected to remain volatile as supplies become constrained by factors such as hurricanes that impact offshore facilities in the Gulf coast of the United States of America and rising global demand especially in energy-intensive manufacturing economies such as China and India.

Several other factors point to continued demand and volatile prices for oil:

- oil producers will continue to divert exports for home consumption
- Future uncertainties in the marketplace arising from short-term reaction to the global political situations (wars, constrained output, damage to infrastructure, speculation)
- Growing demand as a result of economic activities in emerging economies
- Geologic conditions which limit easy access to oil and gas reserves

This situation of volatile oil prices increases agricultural production costs, which will lead to higher food prices. Developing countries will face both high food and fuel prices in this environment of volatile oil prices.

It is also believed that volatile fossil fuel prices will stimulate the push to alternative energy sources and consistent energy policy; therefore insulating The Bahamas to the degree possible, given our national circumstances.

The Bahamian Energy Sector

The Bahamas has some oil and gas potential in non-renewable reserves within its exclusive economic zone (EEZ). There are no proven reserves of easily exploitable fossil fuel sources of significant quantities in the Bahamas based on survey activities undertaken to date. Surveys did indicate some marginal exploitable resources, in deep reserves however, the potential for tapping them at current market rates may not be financially viable. As a result, The Bahamas is wholly dependant on imported petroleum products to meet its needs. This situation is unlikely to change in either the short or medium term based on current knowledge.

Renewable energy resources have yet to be exploited in The Bahamas in any significant way. Based on the Committee's present understanding and information from various national and international assessments, possible renewable resources include waste-to-energy, solar (hot water and power generation by photovoltaic systems), wind and tidal resources across The Bahamas at residential, commercial, industrial and utility (> 1 MW), scales.

The Bahamas' wind potential has not been assessed and as such its possible contribution to the energy supply system is unknown. Evidence based on the meteorological records point to the fact that over the course of the year wind speeds can be harnessed.

Waste-to-energy currently represents the more immediate actionable initiative to increase power supplies in the short term while at the same time improving air quality, reducing pollution and illegal burning of wastes and fires on the public landfills. Additional environmental benefits include the reduction of top soil to entomb waste, recovery of recyclable materials and the reduction of the seepage of contaminants into the subsurface.

Ocean Thermal Energy Conversion (OTEC) processes also represent an exploitable renewable resource. As the Bahama Banks are characterized by steep drop-offs, most of the major islands have a location where OTEC technology would be feasible; however, this technology is at the experimental stage. Seawater district cooling could also be used in these locations, but there are few with appreciable demands for it. Deep-well reverse thermal conversion may also be an exploitable source of energy.

The current situation, given global energy market conditions, raises the following priority policy issues: energy security and access to energy; energy regulation; energy efficiency and conservation; energy economics; renewable technologies and global opportunities. For The Bahamas, these issues are equally important.

Energy security and access to energy

As The Bahamas possesses no known quantifiable, easily-exploited energy reserves of fossil fuels and depends on imported sources to meet its energy needs, its energy security level is extremely low. Threats to global energy security include the political instability of several energy-producing countries, the manipulation of energy supplies, the competition over energy sources, attacks on supply infrastructure, as well as accidents and natural disasters. Long-term measures to increase energy security center on reducing dependence on any one source of imported energy. It can also involve entering into international agreements to underpin international energy trading relationships and the development of contingency plans to respond to supply challenges.

The Bahamas and its service-based economy, is particularly vulnerable to global economic forces that control the cost and availability of fossil fuels. Its share of expenditures expatriated to purchase fossil fuels have grown and the increased use of reverse osmosis to produce potable water has served to increase energy insecurity and dependence.

Access to energy from imported fossil fuels in The Bahamas is directly linked to the ability of the country to access the international oil market and the availability of foreign reserves to pay for the supplies needed. Local shortages of supplies have occurred as a result of one private sector oil retailer in a family island having gone out of business recently.

The introduction of renewable energy options greatly improves The Bahamas' energy security position by allowing the country to diversify its power generation mix once barriers to accessing renewable sources are overcome. These barriers include, but may not be limited to: the non-existence of facilities; lack of regulatory framework; technological maturity delays; low technical ability to acquire and/or exploit the available sources; public awareness, financial resources, the high relative cost of renewable energy and low private sector involvement.

Energy regulation

The Bahamas regulatory framework is governed by the Electricity Act⁶, the Out Island Electricity Act⁷ and the Out Island Utilities Act. The Electricity Act established BEC to secure the supply of electricity, at “reasonable” prices, as well as to purchase, generate, transmit, transform, distribute and sell energy either in bulk or to individual consumers. The Out Island Act provide an opportunity for supplying electricity and creating and operating utilities in the Family Islands, if it is demonstrated to be in the nation’s best interest. Meeting this condition (of national best interest) in the Family Islands has proven difficult for the private sector and BEC continues to provide power to all the Family Islands, except Grand Bahama and small franchise holders.

The Hawksbill Creek Act⁸ also provides for the creation of a franchise holder to provide electricity within the area defined by the Hawksbill Creek Act or areas controlled by the Grand Bahama Port Authority.

This framework has created a near monopoly on electricity production and distribution in The Bahamas. It presents challenges in fostering an environment of competition, efficiency and conservation that will maintain “reasonable” prices for reliable electricity supplies, particularly in a global environment of volatile oil prices.

Energy efficiency and conservation

Efficient energy use, sometimes simply called energy efficiency, is using less energy to provide the same level of energy service. An example would be insulating a home to use less heating and cooling energy to achieve the same temperature. Another example would be installing fluorescent lights and/or skylights instead of incandescent lights to attain the same level of illumination. Efficient energy use is achieved primarily by means of a more efficient technology or process rather than by changes in individual behavior.

Energy conservation is the practice of decreasing the quantity of energy used. It may be achieved through efficient energy use, in which case energy use is decreased while achieving a similar outcome, or by reduced consumption of energy services. Energy conservation may result in increase of financial capital, environmental value, national security, personal security, and human comfort. Individuals and organizations that are direct consumers of energy may want to conserve energy in order to reduce energy costs and promote economic security. Industrial and commercial users may want to increase efficiency and maximize profit.

Conservation can also relate to efforts to reduce or eliminate the wastage of imported fossil fuel products through the control, monitoring, metering and accounting for the products used including efforts to reduce loss, wastage, leakage or spillage from deliberate or accidental acts. Significant volumes of fossil fuels have been reported wasted through leaks, spillage and or wastage throughout the Bahamas. Inventory control practices in commercial and public institutions are reported to be lax and the overall control by the appropriate government regulatory environment deficient.

⁶ Chapter 194, Electricity Act of the statute laws of the Commonwealth of The Bahamas.

⁷ Chapter 195, Out Island Electricity Act of the statute laws of the Commonwealth of The Bahamas.

⁸ Chapters 261, 262, 263, 264, 265 Hawksbill Creek Act of the statute laws of the Commonwealth of The Bahamas

No national assessment has been conducted to assess the Commonwealth's energy use, energy efficiency or the extent of energy conservation efforts. No energy efficiency standards exist and no public policy encourage energy conservation or the efficient use of energy has been promulgated nationally. Regulations to provide for better inventory control practices, monitor loss due to spillage leakage or wastage of fossil fuel products are in need of updating in light of modern practices of the petroleum sector.

It can thus be assumed that any improvement in either measure has come as a result of the acquisition of technologies through the availability in the marketplace of more efficient vehicles, appliances, or equipment for heating or cooling of residences, as no energy-use products are manufactured in the Commonwealth.

The deployment of more energy efficient equipment, for example, using the energy star quality improvements in the US has benefited The Bahamas. The development of modern hotels have similarly made use of energy conservation equipment and employed energy management practices to reduce the cost of operations.

In direct contrast to this initiative, larger less fuel efficient vehicles have also been introduced into the local marketplace and those vehicles have also made their way into the local fleet, thus increasing energy use and reducing mileage of the entire transport sector.

Efforts recently have been made to reduce the cost to consumers of access to energy-saving devices by reducing or eliminating the duties paid on a range of energy efficient or conserving appliances and technologies. No assessment has been made on the effectiveness of these newly introduced measures.

Energy economics

Many primary sources of energy, like other global commodities, exhibit market price fluctuations. While there are many theories about future factors that may influence the direction of primary energy sources e.g., peak oil theory etc., these may lack historical support; however history has revealed that the potential exists for wide energy price fluctuations driven by factors that are difficult to clearly define.

Between the period 2006 to 2007 global energy demand was estimated to be at 87.5 million barrels per day (oil equivalent), up just 2%⁹. During the same period global crude oil prices increased from approximately \$60 per bbl to approximately \$110 per bbl, an increase of nearly 83%. Current year global energy consumption estimates are not yet available; however, during 2008 global crude oil prices have moved upward from \$110 per bbl to \$150 per bbl and then downward to \$65 per bbl. Generic economic principles suggest that prices should be driven by changes in supply and demand; yet there is no evidence to suggest that the volatility shown in global crude oil prices are the result of actual supply or demand changes

Energy prices, like other commodity prices, are subject to significant fluctuations that can challenge national planning given that energy is a key enabler of many planned activities. While

⁹ United States Energy Information Administration

most non-renewable sources follow the trend of petroleum prices, diversifying the primary sources of energy to include renewable, particularly locally produced renewable, may reduce the impact of global crude oil price volatility on The Bahamas.

Energy economics is the deliberate effort to manage the economic impact of the dollar value of energy produced and consumed in The Bahamas. While The Bahamas is a net consumer of energy, the national energy policy (NEP) does consider the economic impact of investing in Bahamian energy production for local consumption and export. The dollar value of locally produced energy should positively offset the economic impact of energy consumed.

Widespread interest in energy management is driven primarily by increasing unit cost of energy (\$/gallon, \$/bbl, \$/kWh) similar to that experienced between 2006 and 2008. Energy concerns begin at the individual level, household or other entity's energy bill but permeate the economy as the cumulative cost of supply cascades through all economic activities that have an energy component. The NEP includes actions intended to better manage the national bill as well as reduce the rate of growth relative to global average.

Many of the priorities suggested in the NEP are intended to influence the units of energy consumed. Conservation encourages Bahamians to reduce their discretionary energy consumption by changing their usage pattern, fostering increased awareness and modifying behavior that contributes to the wastage of energy. Efficiency will encourage Bahamians to reduce their non-discretionary energy consumption by way of choosing more efficient technology. However, there remains a minimum level of non-discretionary energy consumption necessary to support the consensus minimum quality of life in The Bahamas. Non-discretionary energy consumption is best managed by choosing the most cost-effective and economically beneficial means of acquiring, producing, storing and distributing energy.

More than 90% of energy in The Bahamas is generated by fossil fuels and the majority of energy is consumed as electricity or for transportation. Renewable and locally produced energy can enhance energy security, however, the economic attractions of these options will decline as the cost of traditional energy sources cycle downward.

Renewable and locally produced energy is also expected to improve increasing the long-term economic impact of the national energy bill as the cost of energy increase over time. Investing in these energy options is expected to create new employment opportunities and increase the portion of the national energy bill that is multiplied locally.

The NEP should project and measure the actual economic impact of these investments, while at the same time measuring the unit cost and economic impact of traditional sources of energy. Traditional sources of energy will continue to have a significant economic footprint; therefore resources should be devoted to improving their economic impact.

Renewable technologies

Public policy that protects the power companies and franchise holders is believed to be the primary barrier to the provision of energy from renewable sources using renewable technologies to feed into the national grid. The high cost of connecting to the national grid is another barrier. Economies of scale, lack of reliable technical data on the exploitable RE sources, uncertainty about RE reliability, potential and behaviour and extent across The Bahamas, public education and the lack of investment capital or policy to encourage it, has also reduced access nationally.

The overall awareness nationally of the potential of RE sources to reduce the Commonwealth's dependence on imported fossil fuels, reduce greenhouse gases emissions, improve air quality, and reduce remittances of foreign reserves has grown as a result of the recent volatility in oil prices has improved. Recent efforts to communicate the RE potential through meeting and workshops nationally have increased local knowledge of its potential and served to present to the public at large, some of the challenges facing the Commonwealth.

Despite this however, the overall penetration of RE technologies into the economy has been extremely limited when compared to other small island developing states within the region.

Energy opportunities

The promotion of solar water heating systems in Barbados has been successful due to an innovative combination of circumstances, policy interventions, tax incentives and awareness raising efforts on the potential benefits of solar water heaters to the economy. The solar water heating industry in Barbados is estimated to have saved about 130,000 barrels of oil annually. Currently, about 35,000 solar water heaters are installed in homes, commercial establishments and hotels saving about US\$16 million, (assuming electricity usage at normal rates to heat the water) and about 65 million kWh annually, with a ratepayer value of US\$ 12.5 million.¹⁰

Germany in contrast, implemented a feed-in tariff system that has proven effective in fostering the rapid and sustained growth in RE penetration in its national energy mix. In addition to the creation of 214,000 jobs, German achievements include, in addition to the creation of 214,000 jobs, since the start; in 2006, the avoidance of 97 million tonnes of carbon dioxide emissions, penetration of 11.8% share of total gross electricity consumption from renewable energy sources, and creation of a 5.3% share of total primary energy consumption from renewable energy. These achievements were realized at a cost of approximately €5.40 (US\$6.50) per household per month.¹¹

The Bahamas uses approximately 26,000 barrels of imported petroleum products daily to meet its energy needs. Given the volatility of global oil prices and the significance of ensuring national energy security and continuous economic growth, the country's energy matrix needs to be diversified in order to improve energy security, reduce the increasing cost of supplies and

¹⁰ Evaluation Of Renewable Energy Incentives: The Barbados Solar Water Heating Experience; Bob Perlack and William Hinds ;Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831; Ministry of Energy and Public Utilities, Barbados.

¹¹ Feed-in Tariffs – Boosting Energy for Our Future: A guide to one of the world's best environmental policies: World Future Council, Hamburg, Germany.

provide for the further expansion of the infrastructure to meet existing and projected energy demands.

Based on preliminary investigations, experts agree that The Bahamas has the potential for diverse renewable energy resources, including: biomass, ocean, solar and wind. The optimal mix will likely vary between the Bahama Islands based on location, size and population distribution. Feasibility studies and demonstration projects are needed to identify the optimal energy mixes for The Bahamas.

The expansion of the renewable energy sector has the potential, based on the type of technologies employed, to create employment opportunities within the Commonwealth for: (a) services related to assessing energy use and improving efficiency in residential, commercial, public and industrial settings, particularly in the tourism sector; (b) retrofitting of buildings and facilities with more energy efficient technologies, cooling and heating systems as well as increased energy efficient motors, lights and related equipment; (c) the expansion of private sector activities in the production, maintenance and sale of energy from renewable sources using feed in tariffs, power purchasing agreements and the overall liberalization of the energy sector; and (d) opportunities to export this experience to other small island developing states.

INITIAL VIEWS OF THE NEPC

The Bahamas NEP aims to achieve the sustainability of energy supplies. This would be achieved by upgrading, expanding and modernizing the energy infrastructure to include alternative sources of supplies; strengthening national institutional capacities, expanding operational and financial opportunities in the energy sector; providing for the increased access and usage of alternative energy sources; increasing energy efficiency in buildings, industry and related sectors; reducing energy used in transport and careful and deliberate management of The Bahamas' dependency on imported fossil fuels.

Policy Targets

SHORT-TERM TARGETS (1-5 years)

- Completion of data gap analysis on the various sectors, particularly the transportation sector
- Complete phase-out of incandescent light bulbs and their replacement with mercury-free compact fluorescent light bulbs (CFL) by 2010
- Investigation and implementation of waste-to-energy technology for New Providence
- Investigate the option of combining heat and power and cogeneration type technologies
- Explore the use of biofuels
- Develop a means to measure the average annual unit cost of each form of energy consumed by sector and geographic area (\$/gallon, \$/kWh, \$/bbl)
- Develop a means to measure and track the annual national energy bill and the impact on the economy
- Develop a regulatory framework to monitor, assess fossil fuel leakage, reduce losses of imported products and conserve resources of products imported for domestic consumption
- Develop a means to measure the economic impact of the annual national expenditure on traditional sources of energy e.g., portions multiplied locally: number of jobs and estimated payroll; percentage of raw materials and other consumed goods and services procured locally; and percentage of industry locally owned
- Introduce an integrated traffic management system and public transport system:
 - Reduce average commute times on New Providence by 20% by 2010
 - Increase ridership of public transport to 10-20% by 2010
 - Employ advanced energy efficient lighting systems in public spaces supported by signage and traffic management systems
- Reduce public buildings energy usage by 30% by 2010

MEDIUM-TERM TARGETS (5-10 years)

- Increase the penetration of renewable energy sources in the Commonwealth to 10- 20% of supplies,
- Deploy renewable energy technologies in several small communities with >50% of power from renewable sources
- Increase fuel efficiency of motor vehicles to 30–35 mpg for 70% of licensed vehicles through the application of incentives to import and use more efficient vehicles in private and private sector transport

- Reduce dependence on imported fuel oils by:
 - Increased building energy efficiency by introducing standards in public buildings for cooling public spaces, heating water, lighting and the deployment of the highest energy star ratings of equipment
 - Increased use of solar hot water systems to 20 to 30% of all households
 - Increased efficiency of cooling systems and increasing SEER ratings
 - Increasing the deployment and usage of energy efficient lighting systems and fenestration systems (windows) in public buildings
 - Increased public awareness and education on RE potential and usage
 - Requiring all Government financed homes and buildings use, install, operate and maintain solar hot water systems
- Develop pilot and demonstration systems for residential cooling using reverse thermal gradient in low cost housing estates
- Assess the Commonwealth's ocean thermal energy conversion (OTEC) potential in municipal-scale power systems and develop a pilot activity in this regard
- Assess the Commonwealth's wave, tide and wind potential as well as identify potential sites for pilot and or demonstration facilities
- Assess the Commonwealth's biofuels potential assessed for the islands of Grand Bahama, Andros and Abaco
- Develop a means to estimate the average annual unit cost of alternative sources of energy
- Develop a means to measure the economic impact of the annual national expenditure on alternative sources of energy e.g., portions multiplied locally: number of jobs and payroll; percentage of raw materials and other consumed goods and service procured locally; and the percentage of industry locally owned
- Develop filters to achieve the optimum level of local participation in any energy entity that should be pursued during a period of ownership transition, e.g., cost and pace of change of technology, capital requirements, existence of qualified Bahamian resources, access to supporting supply and technical resources, compliance with multi-national treaties

LONG-TERM TARGETS (10-20 years)

- All new installations of water heaters are solar water heaters
- Develop a programme to pursue cost-effective opportunities in reducing energy consumption
- Develop a programme to minimize greenhouse gas emissions
- Establish a funding mechanism, sources for energy use and constant technology innovations and the engagement of the private sector through private/ public partnerships in the expansion, upgrade and renewal of the energy services infrastructure
- Develop extended targets for changes in the energy mix based on extended unit cost and economic impact estimates by energy source, informed by local experiences and historical data

Policy Objectives

The national energy policy should encompass short, medium and long-term goals designed to foster energy conservation and diversification of energy sources and energy use sectors. The ultimate goal is to protect gross domestic product, foreign exchange and reserves while simultaneously minimising energy consumption and increasing energy efficiency and security.

SHORT-TERM POLICY OBJECTIVES

➤ Energy Conservation

- Develop and implement a public sector energy conservation programme and marketing campaign. This programme must be an aggressive campaign that includes a comprehensive energy audit of the various government agencies and holdings, with the goal of achieving energy-consumption reduction targets. This programme must be transparent and will require a marketing scheme to promote the programme, to lead both the private sector and the public by example, to encourage and influence private sector participation (starting with government vendors and service providers) and competition.
- Develop and implement a consumer-oriented energy conservation campaign. Such a campaign should include consumer education on “wise” energy use and conservation (and consequently monetary saving) tips, and an outreach component to advise the public of its role in strengthening national self-sufficiency and energy security. In order to maintain enthusiasm and reinforce the importance of consumer energy conservation, the campaign also requires a marketing campaign that demonstrates the consumer savings achieved through the various tips promoted in the overall campaign.
- Develop and execute an implementation strategy for the economic incentives announced for the 2008/9 budget cycle. This includes working with the Customs Department to ensure customs officers are able to identify the energy-saving goods subject to tax-rate reduction or exemption. Consumers should also be advised of these goods. (This may be a component of the consumer-oriented energy conservation campaign.)

➤ Energy production management

- Review and establish a guideline for independent power production (IPP).
- Explore the option of combining heat, power and cogeneration type technologies to support the ongoing effort of capacity deferment.

➤ Assess renewable potential

- Identify the data gaps on the various sectors, particularly the transportation sector, and then formulate and implement solutions for closing the gaps and setting realistic targets for each sector.
- Investigate the potential exploitability of various renewable energy sources and technologies, including waste-to-energy, wave, tide, wind, photovoltaic systems, and solar water heating units.

MID-TERM POLICY OBJECTIVES

- Fuel economy transport
 - Develop and implement a programme to increase the average fuel economy of vehicles. This programme could include periodic (e.g., once every two or three years for private vehicles and annually for commercial vehicles) vehicle emission testing as a part of the vehicle registration process, a ban on the import of vehicles older than five (5) years, improved enforcement of road traffic and safety legislation.
 - Improve the quality of diesel oils imported for local consumption to reduce particulate emissions in order to improve air quality in urban centres
 - Develop and implement a national strategy for integrated traffic and transportation system management

- Renewable energy implementation plan
 - Develop and implement a renewable energy programme. This programme should encourage the private sector to develop projects to produce electricity using renewable sources (e.g., solar, wind, ocean-thermal) for possible exploitation by the Bahamas Electricity Corporation. The programme can be used to establish targets for renewable electricity sales.

- Energy commission
 - Establish a permanent energy commission, responsible for overseeing the implementation of select national energy initiatives, stemming from the national energy policy.

- Fill data gaps (IDB projects)
 - Identify the data gaps on the various sectors, particularly the transportation sector, and then formulate and implement solutions for closing the gaps and setting realistic targets for each sector.

- Develop energy efficiency standards
 - Establish energy efficiency standards (e.g., building standards) for incorporation into the existing regulatory regimes. Stakeholder consultation on the proposed standards should be done, as well as compliance promotion and enforcement.

LONG-TERM POLICY OBJECTIVES

- Reduce the rise in energy consumption and reduce use on a per capita basis
 - Develop and implement a programme to pursue cost-effective opportunities to further reduce energy consumption by various target sectors and individual consumers.
 - Develop and implement a programme to minimize greenhouse gas emissions.
 - Establish funding mechanisms for identifying, implementing and promoting sustainable energy use and technology innovation that support efforts to achieve the targets outlined in the national energy action plan.

PROPOSED IMPLEMENTATION STRATEGY

Table 1 details supporting efforts that various government agencies may execute in the short and medium terms to initiate the implementation of the policy. These activities address energy conservation and efficiency. Some activities are designed to measure programme effectiveness and economic impact. The NEPC considers all of these activities as sufficiently independent to allow concurrent development and execution.

The NEPC has taken advantage of the ongoing efforts of the IDB to assist The Bahamas in the assessment and development of its national energy sector through the provision of technical and capacity-building efforts. Regionally, similar efforts initiated some eight (8) years ago assist CARICOM member states in these initiatives. The result is that the IDB has detailed two technical assistance activities under its INFRAFUND and SECCI funds (see Annex 4).

Additionally, The Bahamas may exploit assistance opportunities offered by the Global Environment Facility (GEF), Caribbean Renewable Energy Development Programme (CREDP) and the European Union Energy Initiative.

Table 2 links projects the Government is currently negotiating with the IDB, GEF and CREDP with policy targets and objectives. These projects are complementary and supportive initiatives to the energy policy and the national efforts proposed in Table 1.

Responsible Agency	Target	Activity
		<p>usage and develop programmes to monitor, track and reduce usage.</p> <ul style="list-style-type: none"> ▪ Provide incentives for staff to reduce energy usage, provide targeted funding to Ministries to implement proposed measures, based on the energy audit. ▪ Create the means of tracking energy usage and identify less efficient accommodations. Use this data to prioritize process of relocations and upgrades of office accommodations. ▪ Monitor energy used in the cooling of public buildings and provide for the use of timers and on/off switches to control energy used. Set average maximum temperature at a predetermined comfort level (75-78 °F). ▪ Replace inefficient CFT computer monitors with LCD panels across the public service. ▪ Require financial officers to monitor, track and audit all water as well as energy usage and track efforts to reduce and conserve.
<u>Ministry of Finance</u>	<i>Measure and monitor the economic impact of national expenditures on energy sources</i>	<ul style="list-style-type: none"> ▪ Develop a means to measure the average annual unit cost of each form of energy consumed by sector and geographic area (\$/ gallon, \$/kWh, \$/bbl) ▪ Develop a means to estimate the average annual unit cost of alternative sources of energy being considered: <ul style="list-style-type: none"> - renewable and other locally produced energy - traditional sources ▪ Develop a means to measure and track the annual national energy bill and the impact on the economy including the resulting changes from the NEP initiatives. ▪ Develop a means to measure the economic impact of the annual

Responsible Agency	Target	Activity
		<p>national expenditure on traditional sources of energy e.g.,</p> <ul style="list-style-type: none"> - Portions multiplied locally: <ul style="list-style-type: none"> • number of jobs and estimated payroll • percentage of raw materials and other consumed goods and service procured locally • percentage of industry locally owned ▪ Develop a means to estimate the potential economic impact of alternative sources of energy being considered <ul style="list-style-type: none"> - Portions multiplied locally: <ul style="list-style-type: none"> • number of jobs and estimated payroll • percentage of raw materials and other consumed goods and service procured locally • percentage of industry locally owned ▪ Develop filters to achieve the optimum level of local participation in any energy entity that should be pursued during a period of ownership transition e.g., <ul style="list-style-type: none"> - Cost and pace of change of technology ▪ Capital requirements
<p><u>Department of Social Services</u></p>	<p><i>All subsidized housing to reduce energy usage 15 % by the end of the next fiscal year</i></p>	<ul style="list-style-type: none"> ▪ Provide for the routine monitoring of energy usage in subsidized public housing, replacement of lighting units, accommodate CFL units. Retrofit of water and toilets to provide for low water usage and low-flow flushing. ▪ Design of senior citizen facilities to provide for the most efficient cooling and heating systems required in elderly accommodations.
<p><u>Statutory Agencies (Hospitals, Post Office, etc.)</u></p>	<p><i>Improve energy usage 15 % by the end of the next fiscal period</i></p>	<ul style="list-style-type: none"> ▪ Create a mechanism to coordinate efforts to cost effectively undertake a comprehensive energy audit and develop a system for improving energy efficiency by coordinating;

Responsible Agency	Target	Activity
		<ul style="list-style-type: none"> - Audits of all large motors, a replacement programme for older less efficient ones and standards for the acquisition of new motors; - Assessments of vehicle fleet efficiency and implement standards for replacement of vehicles using as one of the criteria fuel efficiency; - Replacement of old, air-conditioning units and systems with energy efficient HVAC systems in customer service centres, offices and other open spaces.
<u>Department of Road Traffic</u>	<i>Reduce average commute times on all major arteries at peak travel times by 15 – 30%</i>	<ul style="list-style-type: none"> ▪ Assess average commute times on major arteries on New Providence ▪ Provide and implement as early as possible an integrated traffic management system for New Providence including, traffic lights, rush-hour regulations, staggered business hours, access and use of heavy vehicles during rush hours
<u>Public Hospital Authority</u>	<p><i>Reduce energy usage by 25% by retrofitting lighting and cooling systems in all hospitals and clinics</i></p> <p><i>Design new public hospital using defined EE and EC standards</i></p>	<ul style="list-style-type: none"> ▪ Assess energy usage in public hospitals and clinics, implement replacement and upgrading programmes, define EE standards for all major institutional elements ▪ Assess opportunities in new and existing facilities to conserve water, reduce energy use make use of energy efficient design principles
<u>Ministry of Public Works & Transport</u>	<i>Assess applicability of employing Leadership in Energy and Environmental Design (LEED)</i>	<ul style="list-style-type: none"> ▪ Accomplish the following: <ul style="list-style-type: none"> - Define a Bahamian "green building" standard by establishing a common standard of measurement

Responsible Agency	Target	Activity
	<i>principles in all public buildings and facilities</i>	<ul style="list-style-type: none"> - Promote integrated, whole-building design practices - Recognize environmental leadership in the building industry - Stimulate green competition - Raise consumer awareness of green building benefits - Transform the building market in the major areas of: water efficiency, energy usage (lighting and cooling), materials (doors windows, hurricane shutters) and site selection (orientation, vegetative buffering)
<u>Ministry of the Environment</u> <u>Ministry of Education</u>	<i>Design and implement a nationwide public education and awareness programme on EE, EC and sustainable energy and water usage</i>	<ul style="list-style-type: none"> ▪ Input from BEC, Water & Sewerage Corporation, Ministry of Public Works & Transport, Bahamas Information Services, Ministry of Tourism in identifying options and individual habits, outlining tips, and developing a marketing strategy
<u>Ministry of the Environment, in concert with; Bahamas Electricity Corporation; Public Utilities Commission; Grand Bahama Power Company; Office of the Attorney General</u>	<i>Review of the regulatory framework of The Bahamas</i>	<ul style="list-style-type: none"> ▪ Ministry of the Environment, BEC, Grand Bahama Power Company, Public Utilities Commission and the Office of the Attorney General to review the existing regulatory framework to assess potential for increased access by the private sector to the national grid, feasibility of buy-in tariffs and other instruments, approach for establishing an energy commission and its mandate ▪ Cooperate with other Ministries and Departments in the implementation of the National Energy Policy

Table 2 National Energy Policy Implementation Matrix

NATIONAL ENERGY POLICY AND ACTION PLAN IMPLEMENTATION MATRIX				
<i>THEMATIC AREA</i>	<i>POLICY OBJECTIVE</i>	<i>POLICY TARGET</i>	<i>TIME FRAME (ST/ MT/ LT)*</i>	<i>MEANS OF ACHIEVING TARGET</i>
ENERGY CONSERVATION	Develop and implement a public sector energy conservation programme.	Reduce public buildings energy usage by 30% by 2010	ST	INFRAFUND Project SECCI Project
	Develop and implement a consumer-oriented energy conservation campaign.	Complete phase-out of incandescent light bulbs and their replacement with mercury-free compact fluorescent light bulbs (CFL) by 2010	ST	SECCI Project GEF Project
	Develop and execute an implementation strategy for the economic incentives announced for the 2008/9 budget cycle.	Reduce dependence on imported fossil fuels for certain usages	ST	SECCI Project
	Identify the data gaps on the various sectors, particularly the transportation sector, and then formulate and implement solutions for closing the gaps and setting realistic targets for each sector.	Introduce an integrated traffic management system, public transport system to (1) reduce average commute times on New Providence by 20% by 2010; (2) increase ridership of public transport to 20-30% by 2010; and (3) employ advanced energy efficient lighting systems in public spaces	ST, MT	SECCI Project
	Develop and implement a programme to pursue cost-effective opportunities to reduce further energy consumption by various target sectors and individual consumers.	Reduce dependence on imported fossil fuels for certain usages	LT	SECCI Project

* ST = SHORT TERM; MT = MEDIUM TERM; LT = LONG TERM

NATIONAL ENERGY POLICY AND ACTION PLAN IMPLEMENTATION MATRIX				
<i>THEMATIC AREA</i>	<i>POLICY OBJECTIVE</i>	<i>POLICY TARGET</i>	<i>TIME FRAME (ST/ MT/ LT)*</i>	<i>MEANS OF ACHIEVING TARGET</i>
	Develop and implement a programme to minimize greenhouse gas emissions.		LT	SECCI Project
RENEWABLE ENERGY	Investigate the potential exploitability of various renewable energy sources and technologies, including waste-to-energy, biodiesel, wave, tide, wind, photovoltaic systems, and solar water heating units.	Increase the penetration of renewable energy sources in the Commonwealth to 20- 30% of supplies	ST	SECCI Project
	Develop and implement a renewable energy programme.	Increase the penetration of renewable energy sources in the Commonwealth to 20- 30% of supplies	MT	SECCI Project
ENERGY EFFICIENCY	Review and establish a guideline for independent power production (IPP).	Modernization of energy control regime	ST, MT	INFRAFUND Project
	Explore option of combining heat and power and cogeneration type technologies to support the ongoing effort of capacity deferment.		ST, MT	INFRAFUND Project
	Develop and implement a programme to increase the average fuel economy of vehicles.	Increase fuel efficiency of motor vehicles to 30–35 mpg for 70% of licensed vehicles	MT	
	Establish energy efficiency standards (e.g., building standards) for incorporation into the existing regulatory regimes.	Modernization of energy control regime	MT	SECCI Project

NATIONAL ENERGY POLICY AND ACTION PLAN IMPLEMENTATION MATRIX				
<i>THEMATIC AREA</i>	<i>POLICY OBJECTIVE</i>	<i>POLICY TARGET</i>	<i>TIME FRAME (ST/ MT/ LT)*</i>	<i>MEANS OF ACHIEVING TARGET</i>
	Establish a permanent energy commission, which is responsible for overseeing the implementation of various national energy initiatives, stemming from the national energy policy.	Modernization of energy control regime	ST	CREDP Project, EUEI Project
	Establish funding mechanisms for identifying, implementing and promoting sustainable energy use and technology innovation that support efforts to achieve the targets outlined in the national energy action plan.		LT	

LIST OF ABBREVIATIONS AND ACRONYMS

bbf	barrel
BEC	Bahamas Electricity Corporation
CARICOM	Caribbean Community
CFL	compact fluorescent light bulb
CIA	Central Intelligence Agency
CREDP	Caribbean Renewable Energy Development Programme
EE	energy efficiency
EUEI	European Union Energy Initiative
est.	estimate
GDP	gross domestic product
GEF	Global Environment Facility
GoBH	Government of The Bahamas
IDB	Inter-American Development Bank
INFRAFUND	Infrastructure Fund
IPP	independent power production
kW	kilowatt
kWh	kilowatt-hour
LED	light-emitting diode
MOTE	Ministry of the Environment
mpg	miles per gallon
MW	megawatt
NEP	national energy policy
NEPC	National Energy Policy Committee
OTEC	ocean thermal energy conversion
PPA	purchase power agreement
RE	renewable energy
SECCI	Sustainable Energy Climate Change Initiative
SEER	seasonal energy efficiency ratio
TC	technical cooperation
US	United States
USA	United States of America
WE	waste-to-energy
WIREC	Washington International Renewable Energy Conference

ANNEX 1: NATIONAL ENERGY POLICY COMMITTEE MEMBERS

<u>Name</u>	<u>Organization</u>
Philip Weech (Chair)	Chairman of National Energy Policy Committee
Keith Bishop	Islands by Design
Hugh Chase	Ministry of Finance
Gilles Deal	Ministry of The Environment
Anthony Dean	Abadean Engineering
Kevan Dean	Kerzner International Bahamas Ltd
Jerome Elliot	Bahamas Electricity Corporation
Leonard Ezeqibunam	College of The Bahamas
Cyprian F. Gibson	Bahamas Society of Engineers
Keith Ginton	Esso Ltd.
Danielle Hanek	Ministry of The Environment
Earlston McPhee	Ministry of Tourism & Aviation
Oswald F. Moore	Texaco Bahamas Ltd
Stacey Moultrie	The Nature Conservancy
Rudolph Pratt	Maritime Affairs
Vernon Ritchie	Marine Tankers

ANNEX 2: NEPC RESOURCE PERSONS

<i>Name</i>	<i>Area of Expertise</i>
Richard Cant	Oil & Gas Resource Potential in The Bahamas
Arthur Rolle	Renewable Energy Resource Potential in The Bahamas

ANNEX 3: THE NATIONAL ENERGY PLEDGE

SUMMARY TITLE: Development of an Energy Policy for the Commonwealth of The Bahamas

MAIN OBJECTIVES: To establish a National Energy Committee whose primary objective is to review and implement measures to reduce The Bahamas' dependency on the use of fossil fuels

EXPECTED RESULTS/ IMPACTS:

- A reduction in the use of fossil fuels
- Increased efforts to slow global warming and reduce greenhouse gas emissions
- A rise in the sale of energy efficient equipment

PLEDGE TARGET AREA: The entire country

TIME FRAME: To be implemented within the next two years

MONITORING PROCESS: Utilisation of techniques that are compliant with internationally set monitoring standards

ANNEX 4: TECHNICAL ASSISTANCE INITIATIVES

The intent of the national energy policy and action plan is to identify and exploit the optimal means of meeting current and projected national energy demands, using the highest fraction of alternative and renewable energy sources as feasible while simultaneously reducing energy losses and maximizing energy conservation. The Inter-American Development Bank (IDB) has agreed to assist the Government of The Bahamas (GoBH) in obtaining the data and information needed to develop the energy policy and action plan by providing technical assistance through two technical cooperation grants: INFRAFUND and SECCI.

The INFRAFUND Technical Cooperation (TC) aims to achieve the sustainability of BEC by upgrading and strengthening BEC's institutional, operational and financial capacity, and providing alternatives to minimize the Bahamas' dependency on fossil fuels. This TC will assist BEC in improving efficiency and exploring the incorporation of alternative, renewable energy sources in the corporation's expansion plans.

The SECCI TC aims to develop, promote and support sustainable energy programs in The Bahamas, and the country's opportunities to claim carbon credits. This TC will contribute to energy and environmental sustainability of The Bahamas.

Technical assistance from the Global Environment Facility (GEF), the Caribbean Renewable Energy Development Programme (CREDP) and the European Union Energy Initiative (EUEI) has also been secured. GEF will fund pilot demonstration projects for the national phase-out and replacement of incandescent light bulbs. Assistance from CREDP will focus on reviewing The Bahamas energy policy regulatory framework; and the EUEI project will specifically address the market conditions for the development and use of renewable energy and energy efficiency systems by mitigating the barriers to their use.

IDB INFRAFUND Technical Cooperation

- **Program goal and purpose.** The general objective of the TC is to upgrade and strengthen the capacity of The Ministry of The Environment (MOTE) which is the entity with responsibility for the energy sector in The Bahamas, as well as to provide alternatives to minimize The Bahamas' dependency on fossil fuels. The **specific objectives** of this TC are to: (i) provide technical assistance to ME to assist BEC in achieving financial and operational sustainability; (ii) explore alternatives for BEC's expansion plan including RE; (iii) prepare an analysis of the current regulatory framework with recommendations to achieve a sustainable energy matrix in The Bahamas; and (iv) support institutional strengthening and capacity building in the areas of Energy Efficiency ("EE"), RE and Waste to Energy ("WE").

- **Component I – Financial and Operational Technical Assistance:** This component is designed to: (i) review the results of the financial audit made to BEC; (ii) assist BEC in improving its operational and financial management (e.g., establishment of indicators for measurable improvements of operational efficiency, tariff structure, including technical and commercial losses, thermal generation efficiencies, increased collection ratios) in order to strengthen the capacity to service debt; (iii) based on the results of the review, analyze

alternatives on how to improve BEC's cash management, and (iv) prepare a strategic pipeline that includes refinancing options, future financing needs for expansion of its system and financial viability for BEC's long terms investments (analyzing and prioritizing projects).

- **Component II – Explore alternatives for BEC's expansion plan including Renewable Energies:** Specifically this component will (i) assess BEC's expansion plan, including the potential diversification of their energy matrix by using RE; (ii) prepare a prioritized list of projects; (iii) provide technical assistance to support the preparation of Purchase Power Agreements ("PPAs") to purchase/sell power from Independent Power Producers ("IPPs") from/to the grid; (iv) determine cost of implementation of RE technologies; and (iv) establish a prioritized plan of action to include RE in the energy matrix of the Bahamas.
- **Component III: Regulatory Framework:** This component will: (i) review and provide recommendations to the existing energy legislation and regulatory policies in The Bahamas; (ii) prepare an analysis of the current regulatory framework and its impacts on the sustainability of BEC and the generation of electricity nationally; and (iii) review the mandate of the Public Utilities Commission and make recommendations; and (iv) provide recommendations to achieve a long-term sustainability of BEC.
- **Component IV – Institutional Strengthening and capacity building in the areas of EE, RE and WE:** This component will: (i) provide technical assistance to review and recommend legislation, regulatory and policy issues to adopt EE measures in public buildings, residential and commercial sector (including tourism sector); (ii) provide technical assistance to review and recommend legislation, regulatory and policy issues to promote RE and WE; (iii) provide the GoBH with training and capacity building to prepare energy conservation plans, prepare RE and WE programs to reduce their dependency of fossil fuels, train energy audits, energy technicians and operators to erect, operate and maintain RE technologies; and (iv) with the information gathered and generated in the previous components, this component will support the preparation of the National Energy Policy.

IDB SECCI Technical Cooperation

- **Program goal and purpose.** The general objective of the this project is to promote and support sustainable energy, including RE, EE, Waste to Energy ("WE") and energy conservations programs in order to ensure a sustainable development in the Bahamas, providing alternatives to minimize the dependency on fossil fuels. The specific objectives of this project are to: (i) provide technical assistance to the GoBH to achieve EE in public buildings, residential sector and commercial sectors, and implement demonstration projects; (ii) explore alternatives for renewable energies and implement pilot projects; (iii) support the GoBH with a waste to energy program and in particular usage of used cooking oil for biodiesel; and (v) finally dissemination of findings.
- **Component I – Energy Efficiency for public buildings, commercial and residential sector:** This component will provide technical assistance to: (i) assess energy uses and electricity consumption patterns; (ii) adapt energy audit protocol and procedures to standardize energy audits in The Bahamas; (iii) conduct EE surveys and audits for public

buildings, residential and commercial sector, and determine the cost for new EE appliances, public lighting, EE cooling systems, etc; (iv) design of a financial instrument to promote EE; and (v) design and implement a pilot project for EE.

- **Component II – Assessment of the RE potential and grid study:** This component will: (i) assess the potential for RE for solar and wind applications and analyze the best options for electricity generation with RE; (ii) Develop a grid study assessing the length and capacity of transmission and distribution lines, status and efficiency of transformers, substations, towers; and assess the viability of connecting generation with RE to the grid.
- **Component III – Assessment of waste to energy potential including the usage of used cooking oil for biodiesel production:** This component will: (i) support the preparation of a WE assessment that will identify the possible options to obtain energy from landfills and other sources of waste; and (ii) identify potential for bioenergy production, including the potential to develop a biodiesel market from recycled cooking oil from cruises and the tourism industry.
- **Component IV– Dissemination of findings:** The TC will finance at least two workshops to validate and disseminate the finding and in coordination with the GoBH, implement a long-term public education and awareness strategy for sustainable energy in the country.