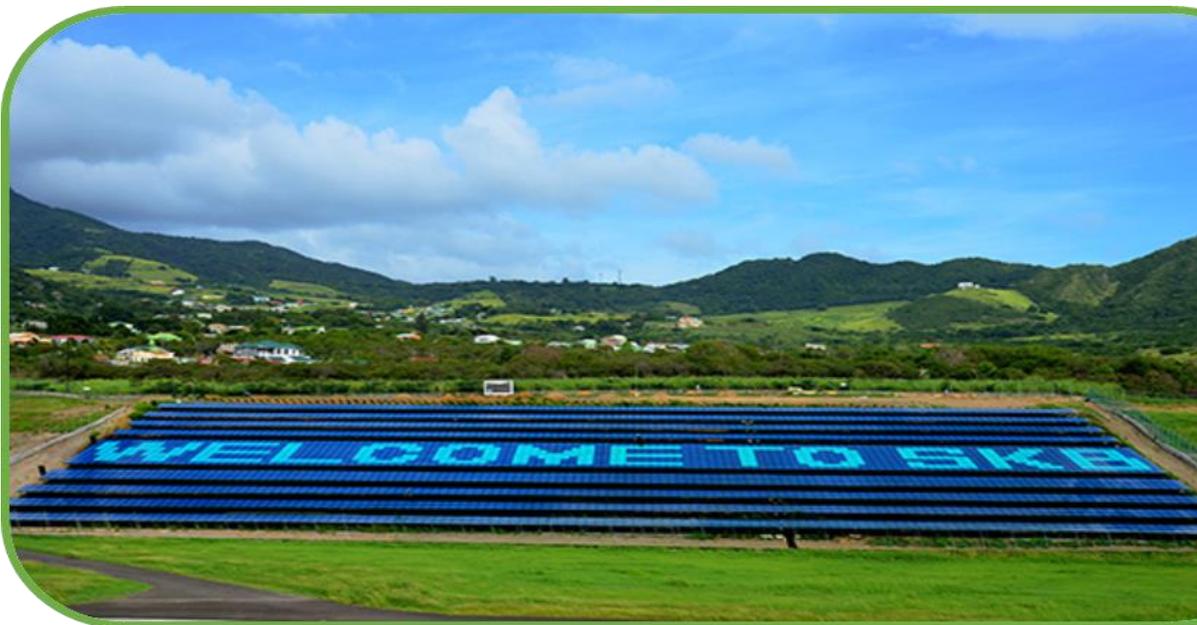




GOVERNMENT OF ST. KITTS AND NEVIS

REVISED NATIONAL ENERGY POLICY



July 2014

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REVISED NATIONAL ENERGY POLICY

Dear reader,

This National Energy Policy is intended to clarify the position of the Government of St. Kitts and Nevis regarding the nation's energy development. It is also intended to foster the development of an appropriate legal, institutional and economic framework for enabling sustainable and sound economic energy activities and services.

Vision

The Federation of St. Kitts and Nevis has decided “to become an island nation with a sustainable energy sector where reliable, renewable, clean and affordable energy services are provided to all its citizens, where energy efficiency and the replacement of fossil energy by renewable energy sources will be promoted in all sectors of the economy, and where by (2020), 100% of the electricity supplied in the country will be produced from renewable energy sources”.

Guiding Principle

This policy strategy is based on the principle that energy services must contribute to achieve:

- A) Sustainable, affordable and secure energy supplies through diversification of energy sources and energy efficiency and conservation;
- B) Accelerated deployment of renewable and clean energy sources in all sectors, where the use of imported fossil fuels is minimized.

In electricity, by (2020), 100% of the electricity supplied in the country will be produced from renewable energy sources, and adequate and modern technology options and equipment will be installed to reduce losses and improve efficiency, and the electrical systems of St. Kitts and Nevis will be interconnected”.

Policy Document Structure

This Policy document is comprised of three main sections, the St. Kitts and Nevis Energy Sector Digest (Section A), where the Energy sector statistics, conditions and development projections are summarized.

This is followed by the National Energy Policy (Section B), in which the Government of St. Kitts and Nevis showcases its vision for energy development in the Federation and highlights its policy goals and objectives.

The potential pathways, solutions and tools for short-, medium- and long- term actions are stipulated in the National Energy Action Plan (Section C), which forms an integral part of this Policy document as a means to implement and enforce the Policy.

The Energy Sector Digest and the National Energy Action Plan need to be seen as dynamic documents that should be reviewed and adopted every three years, in order to account for changes and to steadily guarantee the appropriate enforcement of the overall Energy Policy.

A. Energy Sector Digest

St. Kitts and Nevis Energy Sector

As a starting point it is important to translate the global energy challenges and developments as they pertain to St. Kitts and Nevis. In so doing, this section will briefly explain (1) why it is important to develop a national energy policy and (2) why one cannot do this in isolation from global developments.

In other words, it should be clear why and what kind of effects or impact the status-quo or business-as-usual has on the economy and other sectors of society. The importance of reliable, clean and affordable energy as a tool to achieve sustainable development in St. Kitts and Nevis should also be acknowledged. This sustainable development will improve economic, social and environmental conditions for all citizens.

1.1 Energy Sector Structure

1. The St. Kitts and Nevis Energy Sector is represented in principle by two government owned utilities operating in the twin-island nation. In Nevis the energy department underwent a corporatization process in 2003 and a private utility company, NEVLEC, was formed with the state as the only shareholder. In St. Kitts, the St. Kitts Electricity Department (SKED) is undergoing a similar process, which is on track to be finalized by the end of 2010.

1.2 Energy Supply

2. Given the vulnerability of the economy of the small island developing state of St. Kitts and Nevis, which is heavily dependent upon imported petroleum, and, given the sharp and continuous rise in petroleum prices, it is imperative that the federation does all that is within its power to help ensure a secure and reliable energy supply.
3. The primary energy supply in the federation is fossil fuels including Diesel, Gasoline, Kerosene (jet fuel) and LPG.
4. 68,161 tons of fuel oils were shipped in 2008 to St. Kitts Sea Port and 15,780 tons to Nevis Air and Sea Ports. There is no production of primary and/or secondary fossil fuels in St. Kitts and Nevis¹
5. The global demand for energy is rapidly growing and creates greater competition in securing energy supply. It is projected that the global energy demand will increase by 50% in the next 25 years.² This will eventually lead to disruptions in supply and increased geo-political tensions, having a direct impact on the energy supply services and costs for St. Kitts and Nevis.
6. Another factor that has the potential of impacting the energy supply is peak oil, that is, the time when oil production reaches its global maximum output,

¹ St. Christopher and Nevis Port Authority respectively The Ports division of the Nevis Air & Sea Ports Authority via the Central Statistical Office, SKN, March 2010.

² IEA, *World Energy Outlook, China and India Insights*, Paris 2007. In this energy report the statistics for the international energy development reference scenarios are used unless referred differently.

after which it will decline.³ As the production of oil peaks, it is expected that the price of oil will increase. A peak in oil production would mean the end of low cost oil, and a spike in the price which would make it untenable for any economy. Under these circumstances, diversifying the energy portfolio of St. Kitts and Nevis will become even more important.

7. Due to increasingly expensive and volatile international fossil fuels prices and the high dependency of St. Kitts and Nevis on imported fossil fuels, increasing pressure is building on securing energy supply for power generation and transport at affordable price levels, critical for maintaining and increasing national economic activities.
8. The economy of St. Kitts and Nevis is quite vulnerable to shocks in the price of oil. In the past, these shocks have had far reaching effects including an increase in the cost of living and an escalation in interest rates. The shocks could produce great increases in petroleum import bills, which the federation may have trouble meeting with earnings from current industries, i.e. tourism, light manufacturing, and other commodity exports.
9. Analysis of historical data as well as projections, have shown that under business as usual and optimistic scenarios, the energy demand in the federation continues to grow, indicating continued economic growth. However, under pessimistic and stress conditions, the demand for energy declines, indicating a slowdown in the economy.⁴ It is therefore important to diversify the energy portfolio of the federation.
10. Given the volatility of crude oil prices on the world oil market, St. Kitts and Nevis has a natural interest in diversifying its energy portfolio by using substitute energy sources. These substitute sources can be other conventional energy sources such as natural gas, or they can be renewable energy sources.
11. On the global level the energy consumption related CO₂ emissions are projected to increase by 60% during the next 25 years, leading to an estimated average increase in temperature of 2.0 to 4.5 degrees Celsius.⁵ This will lead to among other sea level rise, and increased frequency and intensity of extreme weather conditions as droughts, hurricanes and rain fall related flooding of which St. Kitts and Nevis is subject to.
12. The gradual warming of the earth's surface temperature will have far reaching effects including changes in the sea level, climate changes (including changes in the intensity of extreme weather conditions such as droughts, hurricanes and rain related flooding), and the destruction of coastal areas, coral reefs,

³ Mayo, S., and Robinson, B., 2006, "Peak Oil: Can We Rely on Our Oil Supply?" *Geodate* 19(1), pp. 5-8

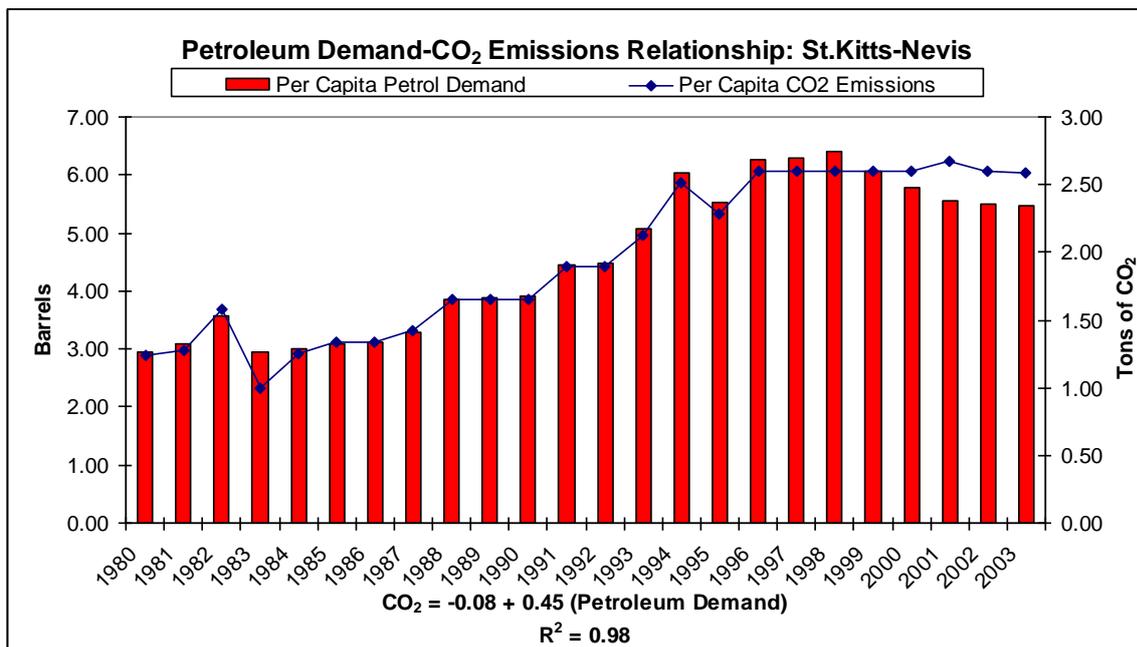
⁴ Lawrence, V., 2007, *An Empirical Analysis of Energy Demand and its Implications for the Caribbean Community and Common Market (CARICOM)*.

⁵ IPCC, *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, New York 2007.

ecosystems, and marine life which will adversely impact the economy in areas like the fishing industry and eco-tourism.

13. Small island states such as St. Kitts and Nevis are particularly vulnerable, as coastal land loss can have dire economic and social effects. The land mass of St. Kitts and Nevis is small as is, therefore the loss of any of this land could lead to emigration of the populations (as retreat may not be an option), thus dealing a severe blow to the economies. The destruction or disappearance of beaches could also have a profound impact on tourism, which is a main source of income in the federation.
14. St. Kitts and Nevis contributed only 0.196 of the 30,377.313 million metric tons of CO₂ produced from the burning of fossil fuels during 2008, that is 0.0006 percent of the total amount produced globally (EIA/DOE). Although St. Kitts and Nevis contributed only a minute amount of GHGs to the global output, the impact of global warming on these small island states is arguably greater than the impact on industrialized countries.
15. Figure 1 illustrates the relationship between per capita petroleum demand and per capita CO₂ emissions. The charts show a strong association between the intensity of energy use, as measured by petroleum demand per capita and CO₂ emissions per capita.⁶

Figure 1: St. Kitts-Nevis: Petroleum Demand Versus CO₂ Emissions



Source: US DOE Energy Information Administration [2005]

16. Due to increasingly expensive and volatile international fossil fuels prices and the high dependency of St. Kitts and Nevis on imported fossil fuels, increasing

⁶ Lawrence, V., 2007, An Empirical Analysis of Energy Demand and its Implications for the Caribbean Community and Common Market (CARICOM).

pressure is building on securing energy supply for power generation and transport at affordable price levels, critical for maintaining and increasing national economic activities.

17. Globally the increased deployment and use of renewable energy technologies and more efficient use of existing energy infrastructure and applications are considered critical tools to combat global climate change and reduce dependence on imported fossil fuels while guaranteeing sustained socio-economic wellbeing and growth.
18. In the move towards the economic development and independence of St. Kitts and Nevis, the federation has sought to diversify their national economy by moving away from agriculture as the main source of income and towards tourism.
19. The Federation of St. Kitts and Nevis, as a Small Island State with limited developed natural, financial and technical resources and a small open and foreign investment oriented economy, is highly interrelated and dependent on global market developments. In recent years, the global food, financial and energy crises challenged the resilience of this twin-island nation, where reliable energy supply plays an important role in sustaining socio-economic activities.
20. All Governmental utilized diesel and petroleum derivatives (mainly for power generation and governmental transport) in St. Kitts are accessed under the Petro-Caribe contract with Venezuela. The petroleum derivatives are purchased at market prices, but the Government receives a credit from Petro-Caribe of up to 60% of the value per barrel under an interest rate of 1% over a period of 25 years. The Ministry of Finance is in charge of the financial exchanges and monitoring of the Petro-Caribe. Tankers from Venezuela ship with a frequency of about 10-15 days to St. Kitts and store the fuel in the storage tanks located at Sol (where the government rents the storage tanks).
21. The private sector and general consumers on St. Kitts however are served by other importers and distributors of Texaco and Sol (former Shell) for St. Kitts and Delta and Texaco for the case in Nevis. Sol imports next to fuel from Venezuela also petroleum derivatives as diesel, gasoline, jet fuel, and maritime heavy fuel from the international market, including Trinidad & Tobago.
22. Nevis does not participate in the Petro-Caribe deal. The NIA recently decided to start importing asphalt products for road construction from Venezuela but no fuels are considered under this agreement. A requirement and problem has been the fact that storage capacities and logistics must be in place so that the fuels can be brought in and stored. The NIA does not own and does not have the possibility to rent such facilities at the moment. NEVLEC buys fuel oil at international market prices from DELTA which is a private entity with its own storage capacity located on Nevis.
23. As of 2010, the national debt of the Federation is 494 million EC\$ (i.e. 32% of the nation's GDP in 2008). St. Kitts earned approximately EC\$ 116 million from exports, EC\$ 23 million from re-exports but spent 877 million EC\$ on

imports, out of which EC\$ 61 million were used for the import of petroleum and petroleum products.⁷

24. The value of fuel imports in 2011 was EC \$209.4 million (US \$77.5 million) which is equivalent to 10% of GDP and 24% of total imports. The CIF value of electricity-related fuel imports was EC \$156.5 million (US \$58.0 million) – equivalent to about 8% of GDP.
25. The foreign currency spent on petroleum constitutes a large percentage of the budget, hence rises in petroleum prices may adversely affect the development plans of the federation by leaving less money available for development and social programs, such as education and community development. In 2013, St. Kitts and Nevis the value of fuel imports in 2011 was EC \$209.4 million (US \$77.5 million) which is equivalent to 10% of GDP and 24% of total imports. The CIF value of electricity-related fuel imports was EC \$156.5 million (US \$58.0 million), equivalent to about 8% of GDP.
26. The role of incentives in encouraging the population of St. Kitts and Nevis to invest in and use more renewable energy resources than are currently being used is a vital one. Incentives seek to increase the generation and use of renewable energy sources by giving help to the utility companies, investors, and consumers who may wish to use renewable energy, but are mindful of the costs associated with their use. Encouraging these groups to eschew or substitute a proven and reliable energy resource for an alternative might prove difficult at first, but will be worth the effort.
27. There are different types of incentives that can be used within the federation to encourage companies, investors, and citizens to generate, use, and invest in renewable energy resources. Some of those incentives are included in the Law of amendment of the Saint Christopher Electricity Supply Act.

1.3 Energy Conversion and Distribution

a) Electricity sector

28. There are two operating power plants in St. Kitts and Nevis, one run by the St. Kitts Electricity Department (SKED) in St. Kitts Island and the other by Nevis Electricity Company Limited (NEVLEC) in Nevis Island. The power plants work independently and are not interconnected.
29. Electricity is produced entirely by diesel-fuelled engines. This places St. Kitts and Nevis in a vulnerable position as the islands are fully dependent on imported fossil fuel for their electricity generation and transportation. Both utilities, SKED and NEVLEC, manage the production, transmission, and distribution of electricity.
30. The installed capacity at SKED (St. Kitts Electricity Department within the Ministry of Public Works, Utilities, Energy and Housing) amounts to 28.5 MW,

⁷ Central Statistical Office Saint Kitts and Nevis, March 2010

using diesel gen-sets, with a peak demand of 25.3 MW and a base load of about 16MW. The utility is since late 2009 dealing with a shortage of capacity and relies on rented diesel generator sets with an accumulated capacity of 7.5 MW. Overall system losses are in the range of about 17%.

31. As of mid 2009 SKED experienced problems with two newly purchased diesel generator sets, where 8.8 MW (2x4.4MW) was lost due to a fire. This is during the past months and currently compensated by renting 7.5 MW from Aggrekko. This results in the current (2010) installed capacity of 28.0 MW (20.5 MW + 7.5MW), where the base load demand is at 16.0 MW and the peak demand 25.2 MW. The annual increase of electricity demand is assumed to be about 5% on a steady base, but taking into account the latest proposed development projects (tourism related) the demand may increase substantially in the short-to-medium term.
32. As a short term solution, the Cabinet has decided to purchase 2x new generators of 3.9 MW each, which are being shipped to St. Kitts and Nevis. Recently Cabinet decided to purchase another 2x 3.9 MW generators which means that a total of about 16MW will be added to the power plant. The Government will pay for the investment. Any potential renewable energy project is considered too far away and hence was not considered when ordering the diesel generator sets. This also means that control equipment or interface possibilities were not considered for future synchronization with renewable energy technologies.
33. The cost of generating 1 kWh in St Kitts and in Nevis is (1 EC?). This price exceeds the average international costs of generation produced from renewable energy sources informed by the International Renewable Energy Agency and the prices paid by feed-in-tariffs for funding in theory “more expensive” electricity produced from renewable energy sources.
34. A solar plant of 0.75 MW in the Robert Llewellyn Bradshaw International Airport has been constructed and it is currently operated by the St. Christopher Air and Sea Ports Authority.
35. There are auto-producers in St. Kitts generating electricity from PV solar.
36. The corporatized NEVLEC produces and distributes electricity on Nevis. The diesel-fuelled generation units sum to an installed capacity of 13.2 MW. However, as of August 2008, the largest unit with a capacity of 2.7 MW was not online and another 2.5 MW unit was found unreliable. As of March 2010 the peak load capacity in the Nevis system is 9MW.
37. In Nevis, a wind power plant of 2.2 MW, which represents around 20% of the installed capacity of the island, has been established and it is operated by a private power producer.
38. The installation of a power plant of 10 MW from geothermal sources for supplying electricity in the island of Nevis is foreseen. In this way, Nevis could generate all its electricity from renewable energy resources (100%) once this project becomes operational. And the cost of electricity production could be significantly reduced.

39. Peak electricity demands for electricity are 25.3 MW for Saint Kitts and 9 MW for Nevis. For Nevis, the lack of reliability of the 2.5 MW unit is a critical supply issue. In the event that the unit does not work during peak hours, NEVLEC's effective capacity is diminished to 8.0 MW and thus, is not able to meet the peak demand (9MW).
40. Furthermore 24-hour self-generation is currently done only at the Marriott Hotel due to the increasing frequency of black and brown-outs experienced in recent months. The Marriott has an installed diesel generator capacity of 4 MW. They consume about 100-120 imperial gallons per month which is purchased from Sol, that imports diesel fuel #6 (50% propane/50% butane) from Trinidad & Tobago. The Marriot uses economizers (heat recovery system) for heating water. They have experienced considerable budget restraints in the recent years/months due to the world crude price increases, now oscillating around the 60-70 US\$/Barrel and therefore prefer to purchase power from the grid with increased introduction of renewable energy technologies to achieve cheaper electricity costs.
41. Solar hot water systems for water heating, air conditioning or cooling have not been considered or assessed in depth by the Marriott. The Marriot has some lands available, for which they considered the possibilities of establishing a mini- or isolated grid with supply from some wind turbines. This however was never pursued as the Marriott prefers to buy power from the grid rather than operating or maintaining a power system. Nevertheless, they did not exclude the possibility of participating in a grid connected wind farm project (in order to generate cheaper electricity) and buying the generated power via the national grid. The chief engineer of the Marriott highlighted the possibility of looking into Waste-to-Energy alternatives, as it is thought that about 50 tons/day of waste is generated in St. Kitts. It is also felt by said engineer that a feasibility study for this type of project should be performed. The Marriot would also welcome liberalization on the market that enables co-generation in the hotel sector, as well as the use of solar hot water and solar PV applications at a decentralized level.
42. Solar Home Systems with battery backup or net-metering are in principal not allowed, as SKED has the monopoly for generation and distribution. In order to facilitate this, the Minister would need to issue a specific license, which is currently not common practice. The Taiwanese IT centre is the only facility has solar self-generation for part of its needs, and this is "tolerated", as they do not have a license.
43. There are no remarkable renewable energy sources being utilized at this juncture, and all energy needs to be imported. Nonetheless, efforts have been made in the past few years to develop and support several RET projects regarding wind and geo-thermal energy, resulting in concrete project developments in the pipeline. Please see section 1.6 for more detail.
44. Adequate programmes for promoting the use of renewable energy sources in all sectors and all energy uses (such as water heating, cooling, transport, industry uses, etc) have to be studied and later implemented by the Government.

45. Losses in the electricity systems of St. Kitts and Nevis have decreased since the creation of SKELEC in St. Kitts and NEVLEC in Nevis. Nevertheless, losses still remain high.
46. SKELEC has 24% of total losses while NEVLEC has around 22-23% of total losses, including, in both cases, technical and commercial losses.
47. As a measure to diminish losses, SKELEC and NEVLEC have both decided to replace existing meters which are considered to be inaccurate by electronic smart meters.
48. NEVLEC is replacing existing (mechanic) meters by electronic meters. NEVLEC would like, if it had financial assistance, to install “advanced metering infrastructure” (AMI) which is an architecture for automated, two-way communication between a smart utility meter with an internet protocol address (IP address) and a utility company. The goal of an AMI is to provide utility companies with real-time data about power consumption and allow customers to make informed choices about energy usage based on the price at the time of use. But access to the necessary funding is still a barrier.
49. Adequate programmes for promoting energy efficiency and conservation in all sectors need to be studied and later implemented by the Government.

b) Transport Fuel Storage and Distribution

1. The transport sector, including air, sea and land transport of goods and persons, is an energy intensive sector, which accounts for about 31% of annual fuel consumption in the country.
2. The GHG Inventory performed in 2004 establishes that the transportation sector is one of the largest sources of GHG emissions in St. Kitts and Nevis. Given the high oil prices, small amounts of consumption and geographic isolation, prices for any imported fossil fuel are high.
3. The supply and demand for gasoline varied over the period from 2000 to 2005, with imports that ranged between 3.27 and 4.86 million gallons.⁸ In relation to the gasoline, the gradual decline is attributed primarily to the attempts by households and businesses to reduce their transportation costs in light of rising oil prices, and the general increase in the cost of living. Gasoline, LPG and Diesel imports over time.
4. In the Federation there are about 320 km (199 miles) of roads on the islands, of which 136 km (85 miles) are paved; the main roads circle each island. There are no formally regulated transportation systems and most data is fairly limited. Basseterre and Charlestown are the principal ports, where state-run and privately operated motorboat services are maintained between St. Kitts

⁸ De Cuba, K and Rivera-Ramirez, M.H., Background discussion paper on bio-energy potential for St. Kitts and Nevis. The General Secretariat of the Organization of American States and Energy Security Group; August 2007

and Nevis. There is no transport policy containing RET or energy efficiency targets to make the transport sector more energy efficient and to promote the use of alternative fuels or alternative transport means as bicycles and cleaner public transport.

5. 99% of Liquefied Petroleum Gas (LPG) is used for cooking purposes at both residential and commercial level. A small fraction is used in the dryers of the hotels. LPG is imported by Sol and is distributed and sold in 20 pound and 100 pound cylinders where the price is regulated to 30EC\$ for the former and 140 EC\$ for the latter. Large commercial clients (hotels and restaurants) receive LPG at a cost of 2EC\$/pound.

1.4 Energy consumption and demand

Electricity consumption and costs

6. Examining energy use by end-use sector is key to understanding the demand for petroleum products. Sectors for which petroleum use is essential include the residential/domestic, industrial, transportation, commercial, and agriculture sectors.
7. Two of the main factors affecting energy demand are the price of petroleum, and per capita GDP. Demand is substantially driven by the needs of trade and commercial activity and the strength of the economies of St. Kitts and Nevis.⁹
8. There are some significant non-governmental energy intensive activities in the economy of the Federation. Hotels and a small industrial sector, including the St. Kitts Bottling Company and the Carib Brewery are somewhat energy intensive.
9. St. Kitts and Nevis dependency on fossil fuels results in unreliable and currently high energy prices. The electricity prices historically have been kept artificially low through a subsidy scheme of the Government in the case of St. Kitts, where, since 2005 the fuel surcharge was removed for residential electricity clients. In contrast in Nevis a fuel surcharge is applied on top of the baseline electricity rates.

Electricity demand

10. The economy of St. Kitts and Nevis has shifted from an agricultural commodity based economy to a tourism-oriented one. Due to changes in the global sugar market, activities in the national sugar manufacturing industry were phased out in 2005. Since then, tourism has become an increasingly important sector to the national economy. In 2009 it contributed to 31.7% of the GDP and as such, it represents an

⁹ Lawrence, V., 2007, An Empirical Analysis of Energy Demand and its Implications for the Caribbean Community and Common Market (CARICOM).

important source of employment (32.2%)¹⁰. This development and shift in national macro-economic priorities has considerable implications to the national accounts and the overall energy supply, demand and use patterns.

11. Notwithstanding the global crises and shift in macro-economic orientation, St. Kitts and Nevis' GDP growth rate at current and market prices as been positive since 1995 (in all years, see Figure 2, were increased economic activities puts growing pressure on the energy needs, capacity expansion planning and security of supply.

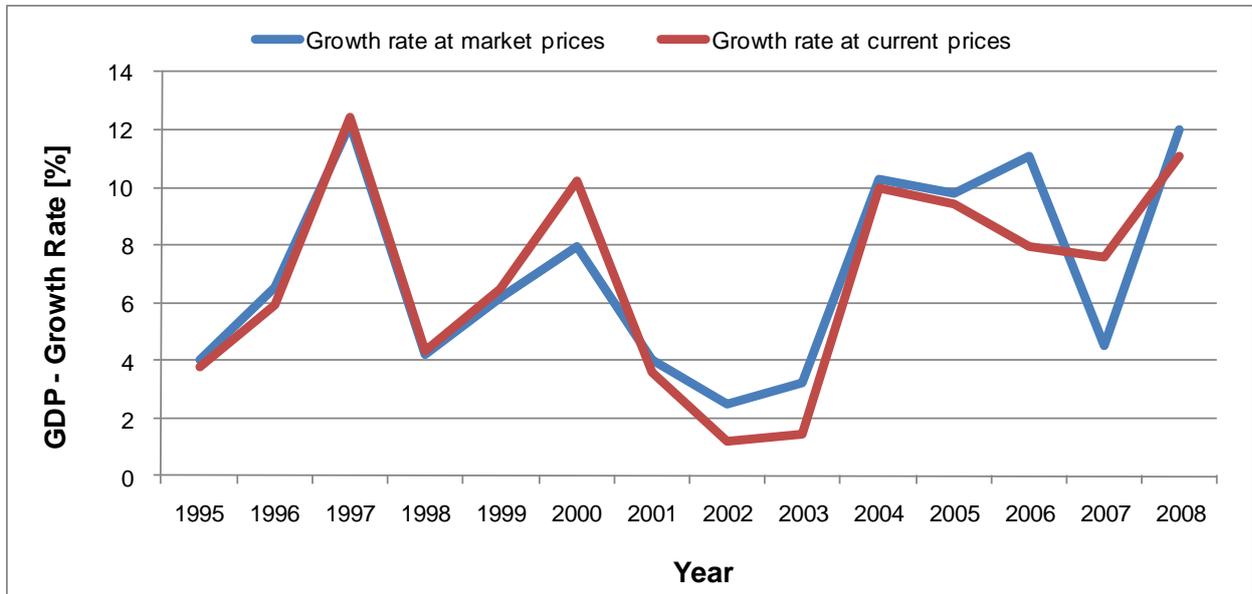


Figure 2. GDP yearly growth rate at current and market prices (Source: Statistics Office, 2010)

12. The annual increase in the Consumer Price Index (CPI) reflects steady growth throughout all sectors, as shown in Figure 3. Only the increase for fuel and lighting is smoothened due to the avoided fuel surcharge for electricity in the residential sector.¹¹

¹⁰ Tourism Economic Research 2009. The World Travel & Tourism Council. URL: http://www.wttc.org/eng/Tourism_Research/Tourism_Economic_Research/Country_Reports/Saint_Kitts_and_Nevis/

¹¹ Central Statistical Office, SKN, March 2010

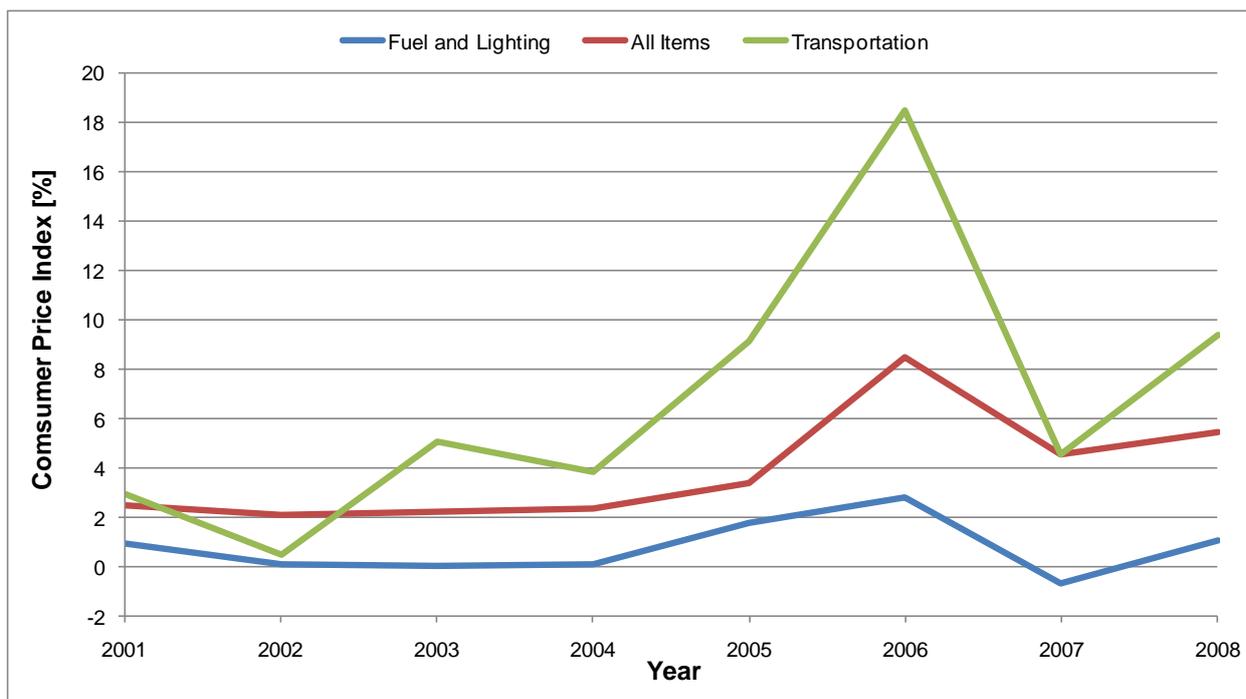


Figure 3. Consumer price index (CPI) yearly variation for selected commodities (Source: Statistics Department, 2009)

13. Statistics indicate incremental variations in electric generation in both islands over the last years. In the case of St. Kitts Island, an increase in electricity generation of about 45.6% was recorded between the years 2000 and 2009. In Nevis Island, this increase was in the order of 64% between the years 2000 and 2009.¹²
14. Studies on electricity demand indicate that demand will increase two-fold over the next decade, even in the most moderate scenarios. The following figures show the power demand projections for St. Kitts and Nevis respectively up to the year 2020.
15. The increasing demand puts extra stress on the national economy, if not considering alternative and more price stable energy sources, such as local renewable energy sources as wind, solar, geothermal and/or biomass. In addition, energy efficiency systems and technologies offer opportunities to reduce financial pressure and costs for energy now and more importantly, for the future.

¹² St. Kitts Electricity Department (SKED) and Nevis Electricity Department via Central Statistical Office, March 2010

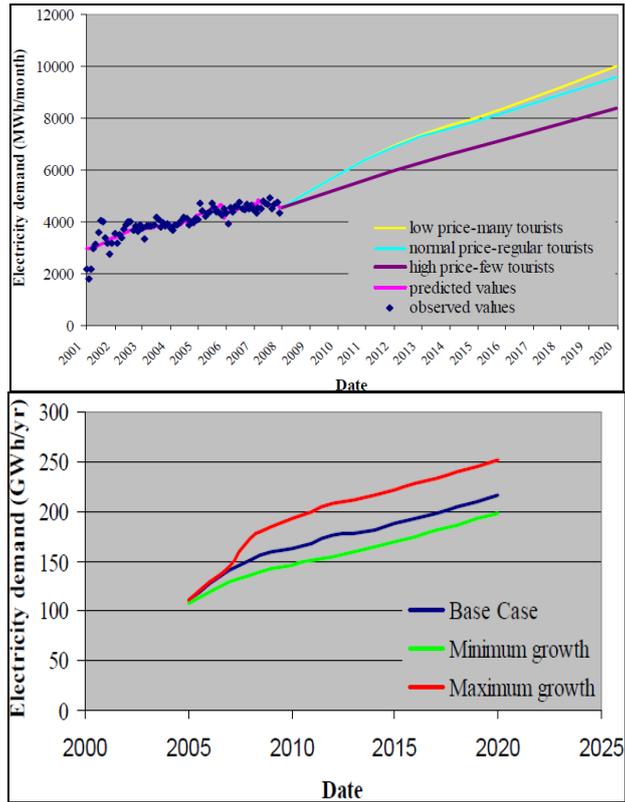
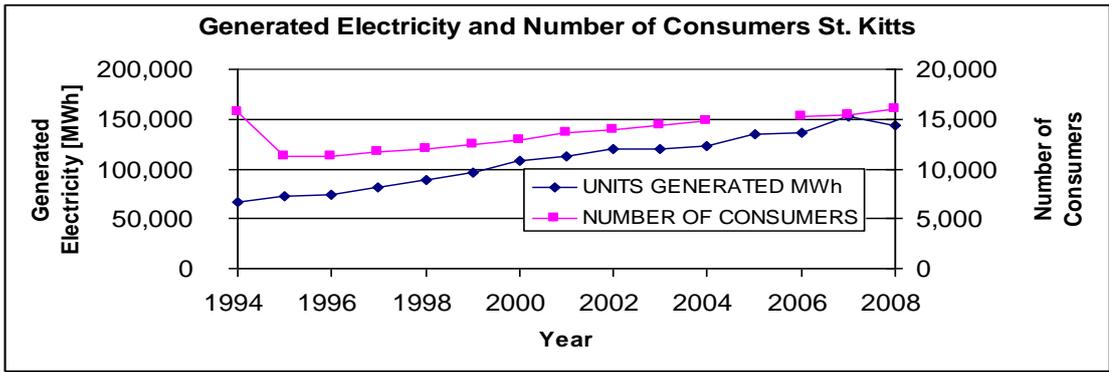


Figure 4 Forecasted annual electricity demand for St. Kitts¹³and Nevis Islands¹⁴

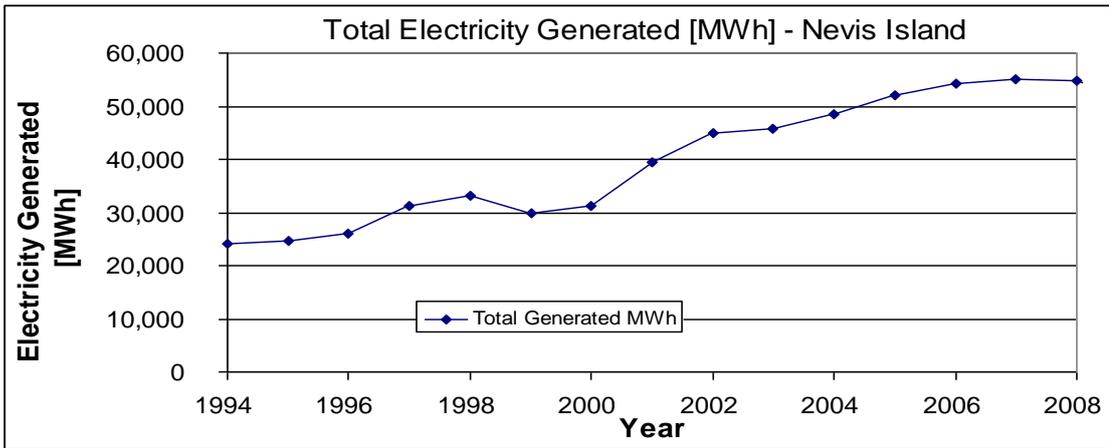
16. Increased domestic energy demand and new developments in the rising tourism sector place severe pressure on future St. Kitts and Nevis generation expansion planning and production capacity. In order for the tourism industry and other economic sectors to be competitive, it is required that the country relies on reliable and cleaner energy supplies and increased energy efficiency levels as well as on a diversified energy matrix that provides more price stability and lower energy generation cost potentials. The historical evolution of the electricity generation on both Islands and the number of consumers and fuel price development were:

¹³ Generation Expansion Plan 2005-2015. Stanley Consultants. April 2005

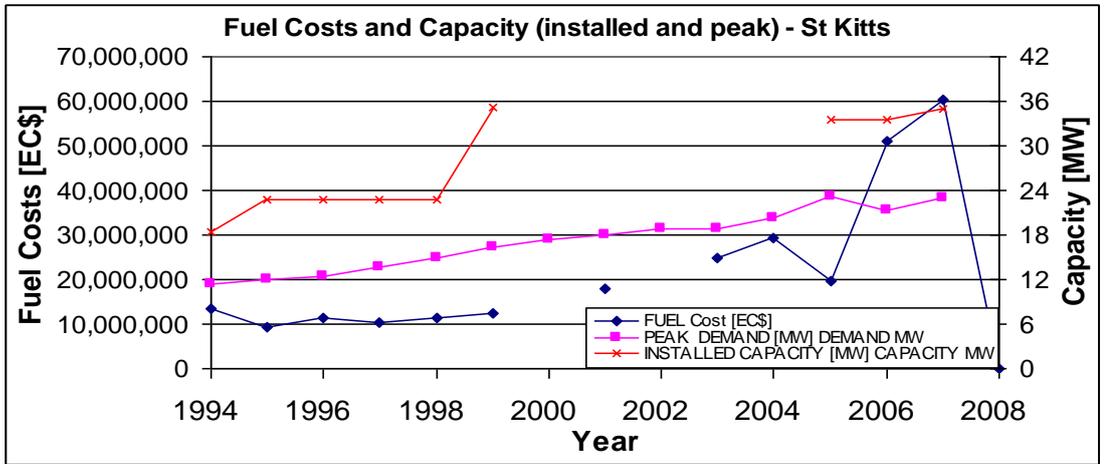
¹⁴ Report NWS-S-2008-33. Justification and pre-feasibility study of an electrical interconnection for St. Kitts and Nevis. E. Brederode; September 2008.



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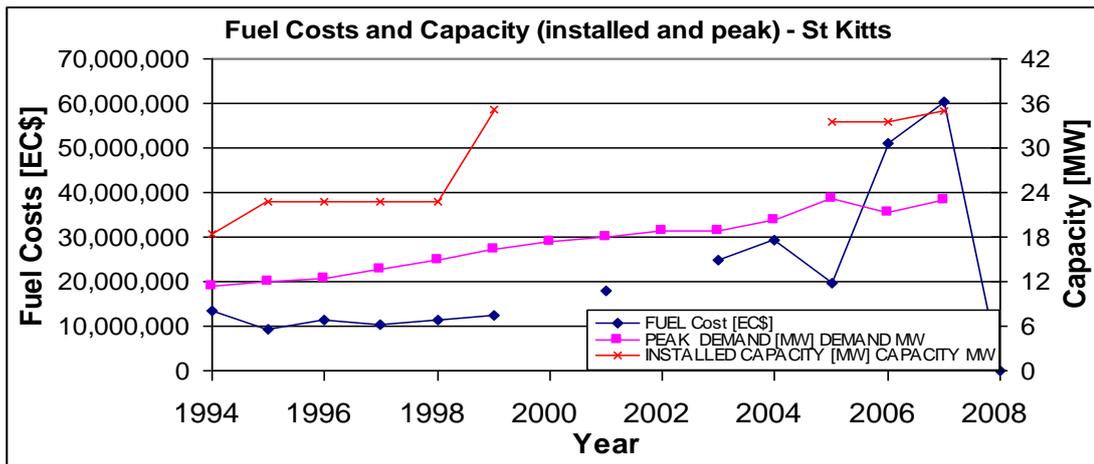


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¹⁵ St. Kitts Electricity Department (SKED) via Central Statistical Office, SKN, March 2010

¹⁶ Nevis Electricity Department via Central Statistical Office, SKN, March 2010

¹⁷ Nevis Electricity Department via Central Statistical Office, SKN, March 2010



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17. Power supply and reliability is critical for the success of this project. The management team of Christophe Harbour is interested in purchasing geothermal power from Nevis. They envision this power to be reliable, cheaper and to comply with their policy of prioritizing green energy. They are very aware of the fact that the scale of this project puts considerable pressure on SKED to secure future power capacity and the need to have proper demand projections based on the different phases of the project development. In the next 7 years 2 hotels with each 250 rooms, a harbour, golf course, 3 restaurants, 1400-1500 villas/houses etc. shall be constructed, utilizing about 20-22MW within the next 5-7 years. On long-term if all villas are build they anticipate in about 15 years (by 2025) a need of 27MW of capacity; the occupancy will be of a seasonal nature, where in high season periods it is important that sufficient power is available.

18. Currently the electricity demand is covered by using SKED power. On short term, for the phase 1 of the project (2010-2012) the management team is considering purchasing and installing about 10 MW capacity (3x 3 MW units) and install Reverse Osmosis units to desalinate water with an initial output of 300,000 gallons per day (this system depends on electric pumps). For the longer term they are considering investing in a 20MUS\$ waste water treatment plant mainly to supply water to the golf course and for secondary water use. The medium/long term objective is to purchase geothermal power from Nevis and they are aware of the conditions that they will have to purchase from SKED.

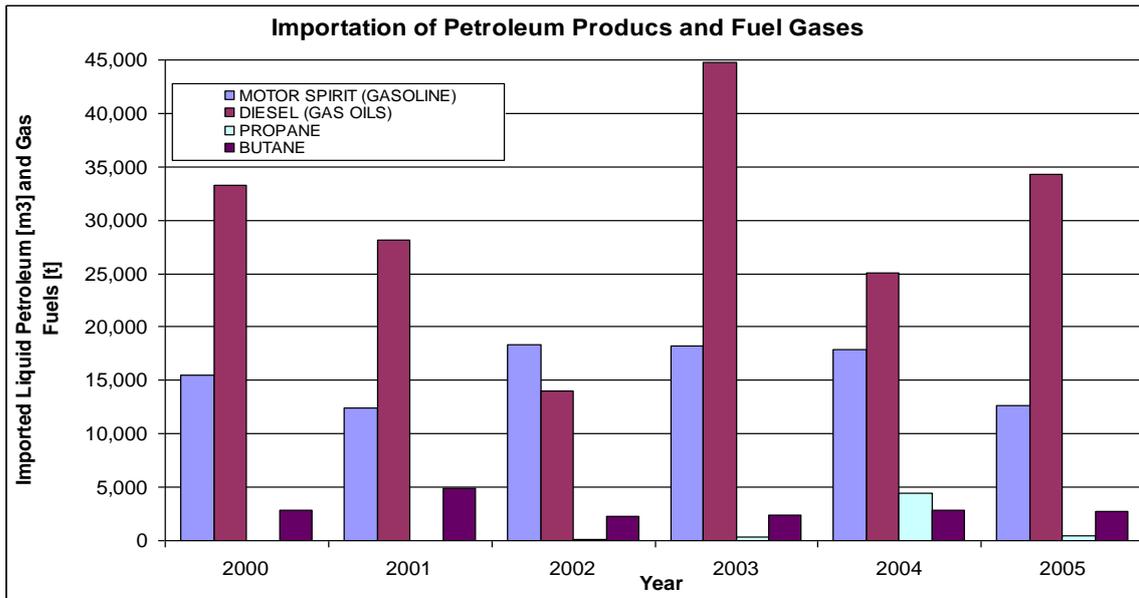
Transportation fuel consumption and costs

19. Gasoline and diesel fuel costs at the gas station on the recent years have been increasing as market values have increased.

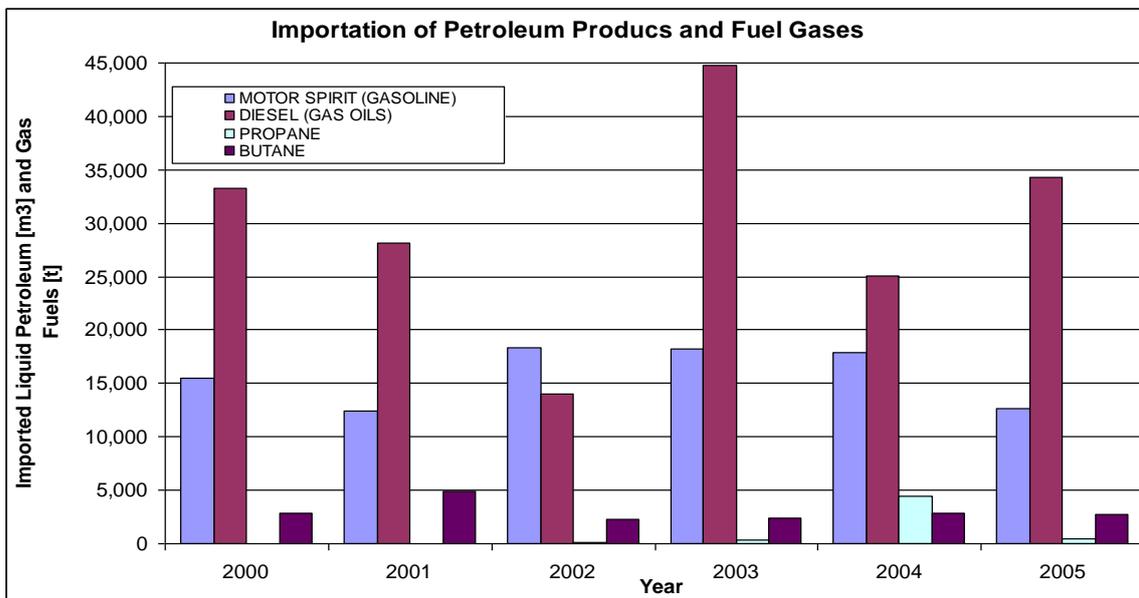
20. Well known is the exhaustion of natural resources and the damage to health and environment caused by the use of conventional transport vehicles and technologies for energy generation. Conventional methods of electricity production and transport through fossil fuels are the most significant contributors to air (greenhouse gases – GHG), land and water pollution in the region and in the Federation.
21. Other significant amounts derive from gas/diesel oil (10.72%), used in the energy industries sub-sector for the production of electricity, and from jet kerosene, a memo item. Smaller amounts of CO₂ emissions also result from other kerosene use (0.62 % in 1994) and lubricants (0.86 % in 1994).¹⁹ The key sources of carbon dioxide emissions only available for the year 1994 were: The Residential Sector – (41%), Road Transport (37%), Commercial and Institutional Uses (10%) and Energy Industries (9%).²⁰
22. The principal direct and indirect environmental challenges posed to St. Kitts and Nevis are either climate change driven, such as hurricanes, flooding, sea level rise and soil erosion (on the medium and long term) or man-made challenges as waste generation and oil spills risks, which directly are triggered by un-sustainable energy consumption and resource utilization patterns at national level.
23. A secure, affordable and sustainable energy supply is critical to social well-being. Energy services are required for electricity generation, water supply, transportation, healthcare, education, agricultural production and telecommunications. All of these services are integral to the development of Saint Kitts and Nevis.

¹⁹ Saint Kitts and Nevis Initial National Communication on Climate Change (2001)

²⁰ Saint Kitts and Nevis Initial National Communication on Climate Change (2001)



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1.5 Response to the Energy Sector Challenges

24. The demand for petroleum is indicative of economic growth. Petroleum demand is substantially driven by the strength of the economy as shown by the relationship between energy demand and GDP per capita.²³

²¹ Central Statistical Office, SKN, March 2010

²² Central Statistical Office, SKN, March 2010

25. Petroleum demand and CO₂ emissions have been shown to have a strong association. As per capita GDP increases, so too does the demand for petroleum. Economic growth is vital to the federation in order to reduce poverty and raise the standard of living for all.
26. A cheap/low-cost source of energy must be readily available in order for economic growth to take place. At present, this energy source is petroleum. It is necessary for petroleum to be used to grow and strengthen the economy, yet using petroleum to grow the economy will lead to increased global warming, the effects of which will be felt disproportionately by the federation. Increasing the use of petroleum increases the carbon intensity of the energy supply.
27. This introduces a conundrum for St. Kitts and Nevis: How does the federation balance its need for economic growth with its desire to reduce global warming. There are several ways in which this conundrum may be addressed. These include the use of cleaner and renewable energy sources.
28. St. Kitts and Nevis contributed a minute 0.0006 percent of the total CO₂ output globally in 2008. It is therefore important to note that even if the federation were to make many changes even to the point of reducing its CO₂ emissions output altogether, it would not make much of a difference in the global warming issues facing the federation, as its contribution is so minute. Global warming is by its very nature a global problem, and as such, is a problem that must be addressed globally. Despite the fact that the federation's contribution to global warming is miniscule, it will still be affected disproportionately by the effects of global warming.
29. St. Kitts and Nevis must lead by example. The heavy reliance of the federation on petroleum is not the appropriate stance from an environmental perspective. Therefore, the federation may adopt measures in order to show other countries, that although it produces very little CO₂, it is taking steps to reduce its own CO₂ output, and thus the harmful effect on the global climate. St. Kitts and Nevis is urged to champion the global use of a low carbon intense energy supply.
30. St. Kitts and Nevis will then be in a stronger position to lobby international organizations to urge countries which contribute far greater amounts of CO₂ emissions to the total global CO₂ output to enact some or all of the same measures, so that they too would reduce their CO₂ output.
31. St. Kitts and Nevis has been addressing these energy challenges by participating in international, regional and sub-regional processes to develop an energy agenda and tackle climate change by focusing on increased regional integration, diversification and aiming for increased energy supply security and diversification. The following is a summary of actions the Government of St. Kitts and Nevis (GSKN) has taken in responding to the energy and climate change challenges.

²³ Lawrence, V., 2007, An Empirical Analysis of Energy Demand and its Implications for the Caribbean Community and Common Market (CARICOM).

32. St. Kitts and Nevis is involved at the level of CARICOM and the OECS in the development of a regional and a sub-regional energy policy where overall renewable energy development targets will form a central role as response to regional commitments made to the Barbados Plan of Action (BPoA) and other U.N. processes in response to global climate change mitigation and adaptation.
33. Although St. Kitts and Nevis is a small contributor to the effects of global Climate Change and therefore limited in its capacity to mitigate its effects, the GSKN has signed and ratified the Kyoto Protocol and is determined to continue the commitment to the United Nations Framework Convention on Climate Change (UNFCCC) and its objectives of reducing global GHG emissions, inter alia offering participation possibilities in Clean Development Mechanism (CDM) and by that co-financing cleaner energy measures.
34. The GSKN included a series of initiatives in its First National Communication on Climate Change (1994) aimed to regularize and minimize traffic flow, and consequently reduce GHG emissions in the transport sector. However, a transportation Master Plan integrating concepts for energy efficiency and conservation, and with wider concerns for improving traffic systems and reducing traffic congestion still is required.
35. Notwithstanding the ratification of the Kyoto Protocol, as of 2010 no National Designated Authority (NDA) under the UNFCCC hosted Clean Development Mechanism (CDM) is in place as the Department does not have the capacities to participate in CDM with an own NDA. For a small island state as the Federation of St. Kitts and Nevis it is difficult to come up with the necessary resources to capacitate such an entity to function properly. Therefore it was expressed that staff salary and resources will be needed in order to make CDM participation possible. The Initial Dialogue on Climate Change under UNFCCC was issued in 2001 and the 2nd Dialogue Document on Climate Change is just issued and under development. The participation at the Clean Development Mechanism was expressed as a clear demand taking in mind the ongoing wind and geothermal projects coming online that could benefit from such support mechanism. A National Focal Point, Ms Hillary Hazel (Permanent Secretary for Sustainable Development) however is appointed for UNFCCC related matters and should be contacted for further issues regarding this topic.
36. A National Energy Task Force was established in 2007 during the assessments of Biomass-to-Energy Alternatives for the former sugarcane lands after the closure of the St. Kitts Sugar Manufacturing Company (SSMC) and developed a draft National Energy Strategy that contained most of the aspects that ought to be incorporated in a National Energy Policy. Unfortunately this Task Force has been dissolved and no further actions were taken to formally adopt the Energy Strategy.

1.6 Renewable Energy and Energy Efficiency Potential

37. St. Kitts and Nevis's endowment of abundant indigenous renewable energy resources like among other, wind, geothermal, solar and biomass (including

waste) provides a key advantage to explore centralized and decentralized usage of clean renewable technologies. The potential of small hydro needs to be adequately studied and assessed. The feasibility of the use of marine energy, including wave and tidal energies, needs also to be analysed and closely followed up.

38. The potential, related costs, infrastructure requirement of all available renewable energy sources must be studied, analysed and properly assessed in order to be able to determine which would be the best feasible national renewable energy portfolio.
39. Several renewable energy resource assessments have led to the identification of renewable energy alternatives including solar, wind, waste-to-energy and geothermal as potential sources. Wind and Geothermal energy development have been identified as the renewable energy sources with the greatest short to medium term development potential.
40. A power purchase agreement (PPA) is being negotiated for a 5.4 MW wind farm (Phase I) including access to 150 acres near the White Gate Development area on the northern part of St. Kitts.
41. A solar plant of 0.75 MW in the Robert Llewellyn Bradshaw International Airport has been constructed and it is currently operated by the St. Christopher Air and Sea Ports Authority.
42. Solar panels in the Government Headquarters building auto-producing around 30% of its electricity needs (100 KW) and solar-powered street lights have been installed in a portion of the main road serving the rural area.
43. Negotiations have been undertaken between a private company and the Government of St. Kitts and Nevis to facilitate the establishment of a wind farm at Belle Vue.
44. The Sugar Industry Diversification Foundation (SIDF) has committed to supporting the transformation of the energy sector by launching a programme in 2013 through which approximately 300 affordable houses provided by the National Housing Corporation (NHC) will be equipped with and powered by solar panels.
45. The Government of St. Kitts and Nevis has also reviewed a number of proposals related to "Waste-to-Energy" projects.
46. In Nevis, a wind power plant of 2.2 MW, which represents around 20% of the installed capacity of the island, has been established and it is operated by a private power producer.
47. The development of a geothermal project in Nevis is foreseen in the short term. The tender process has been completed and a consortium led by Nevis Renewable Energy International was the winning bidder. The corresponding power purchase agreement is in process of negotiations. This project includes the installation of a power plant of 10 MW to produce electricity from geothermal sources for supplying electricity in the island of Nevis. In this way, Nevis could generate all its electricity from renewable energy resources (100%) once this project becomes operational. And the cost of electricity production could be significantly reduced.

48. The extension of the geothermal power plant located in Nevis to supply electricity produced from geothermal sources to St. Kitts, is in process of analysis and negotiation between the Government of St. Kitts and Nevis and the Nevis Island Administration. The project includes the construction and operation of a submarine electricity transmission interconnection between both islands.
49. The adequate renewable energy portfolio to produce electricity in the country is under analysis.
50. With the extension of the geothermal power plant and the interconnection between both islands, St. Kitts and Nevis could become a country 100% supplied with electricity produced from renewable energy sources in the short/medium term.
51. The Government of St. Kitts and Nevis and the Nevis Island administration are studying the convenience and feasibility of exporting electricity from geothermal sources to other neighbouring countries and islands.
52. Nevis has interest in using electric cars that are charged based on geothermal generated electricity in future. Tax incentives and duties for the introduction of such alternative fuel vehicles are desirable. The priority should be to start with authorities and agencies as good examples.
53. The use of electric cars in the whole country will contribute to significantly reduce the dependence of land transport from imported fossil fuels. But to make that feasible, it is necessary before to produce electricity from indigenous, cleaner, alternative and cheaper energy sources. And the Government of the country assumes the compromise to sort out all barriers to make that possible.

B. National Energy Policy

1. Vision and Strategy

1.1 Vision

The Federation of St. Kitts and Nevis has decided “to become an island nation with a sustainable energy sector where reliable, renewable, clean and affordable energy services are provided to all its citizens, where energy efficiency and the replacement of fossil energy by renewable energy sources will be promoted in all sectors of the economy, and where by (2020) 100% of the electricity supplied in the country will be produced from renewable energy sources”.

This will require a comprehensive transformation of all sectors consuming energy towards a more sustainable energy balance where everybody – government, utilities, businesses, NGOs, and citizens – should take part and will extract benefit, though an adequate energy policy and planning. This flexible and enabling policy environment or framework allows the nation to transition from the status-quo or business-as-usual to “an island nation with a sustainable energy sector”, and to adapt to the rapidly changing international and local energy market conditions.

1.2 Principles and Strategy

The policy strategy is based on the principle that energy services must contribute to achieve:

- a) Sustainable, affordable and secure energy supplies through diversification of energy sources and energy efficiency and conservation;
- b) Accelerated deployment of renewable and clean energy sources in all sectors and adoption of measures of energy efficiency in all sectors, with the objective of decrease as much as possible the use of imported fossil fuels.
- c) In electricity, by (2020) 100% of the electricity supplied in the country will be produced from renewable energy sources, and adequate and modern technology options and equipment will be installed to reduce losses and improve efficiency, and the electrical systems of St. Kitts and Nevis will be interconnected”.

This policy will be reviewed and updated every 3 years, in order to evaluate results of this policy, new available technologies and country conditions needing to be considered.

Lower costs and socio-environmentally responsible energy services will stimulate business opportunities for increased macro-economic competition and resilience; incentivize job creation; and address national security and socio-economic challenges.

2. Policy Objectives and Statements

In the fulfilment of the Vision of this National Energy Policy, St. Kitts & Nevis will develop and implement a programme of actions in with the following objectives:

- (a) Sustainable and secure energy supply in order to increase the participation of renewable energy sources and to decrease the consumption of fossil fuels;
- (b) Massive deployment of renewable energy sources in the electricity generation sector with the objective that 100% of the electricity supplied in the country is produced from renewable energy sources by 2020);
- (c) Replacement of the use of fossil fuels and its replacement by clean and renewable technologies in all other sectors consuming primary energy sources;
- (d) Efficient use of energy and energy conservation in all sectors, including in transport and industry;
- (e) Review and adoption of adequate labelling and standards and building codes;
- (f) Affordable and high quality of energy services;
- (g) Ensure universal access to energy services, in particular for the poor and vulnerable population;
- (h) Safe, secure and reliable energy operations;
- (i) Promotion of public and private investments in clean and renewable technologies in the energy sector;
- (j) Ensure the electrical interconnection of St. Kitts and Nevis;
- (k) Establishment of the basis for sustainable development in the country;
- (l) Promotion regional cooperation.

Adequate implementation of this energy policy and formulation of the energy planning for the attainment of these objectives

C. National Energy Action Plan

To become a twin-island nation with a sustainable energy sector where reliable, clean and affordable energy services are provided to all its citizens, particular actions will have to take place addressing the required changes in the energy supply, consumption and management in St. Kitts and Nevis.

In order to comply with the Vision for the energy sector of St. Kitts and Nevis, the broad policy actions are:

- 1) Energy security and diversification of the energy matrix
- 2) Enhancement of institutional capacity
- 3) Renewable energy
- 4) Electricity sector
- 5) Build a complete and coherent legal framework
- 6) Energy efficiency and conservation
- 7) Use of energy in transport

1- Energy security and diversification of the energy matrix and energy planning

This policy is to enhance security of energy supply and diversification of the energy matrix and energy planning

It is necessary to reduce the use of imported fossil fuels in all sectors of the economy and to replace the use of fossil fuels by renewable energy sources in all sectors of the economy.

To ensure this policy it is necessary:

- a) Diversification of the energy matrix through long, mid and short term energy planning;
- b) To identify the potential of all renewable energy sources in the country, preparing and/or outsourcing the necessary studies;
- c) To promote massive deployment of renewable energy sources in all sectors;
- d) To identify all barriers (technical, financial, social, etc) and constrains to the use of renewable energy in all sectors and to the replacement of fossil fuels by renewable and clean technologies in all sectors;
- e) To identify solutions including financial requirements, education and other measures necessary for the replacement of fossil fuels by renewable energy technologies in all sectors;
- f) To gather, prepare, disseminate and made publicly available all information and statistics related to consumption and production of energy in all sectors of the economy;
- g) To strengthen institutions responsible for policy, planning and regulation;
- h) To identify the potential for energy efficiency and conservation in all sectors, including barriers, challenges and financial requirements;
- i) To prepare a long, mid and short term planning to implement the present energy policy, and a road map for the implementation of the actions here proposed.
- j) Ensure a secure and reliable supply of petroleum products at lowest import costs available, and conforming to agreed licensing, product quality standards and environmental specifications.

- k) Encourage fuel conservation and efficient end-use, thereby achieving improved decoupling of primary energy use and economic growth and reducing dependence on imported petroleum products.
- l) Ensure that adequate new and existing petroleum storage and handling facilities are available throughout SKN at strategic locations and conform to standards approved for SKN.
- m) Promote the collection, transportation, environmentally responsible re-use, disposal, or removal of waste oil and other petroleum by-products to minimize adverse impacts on soil, ground-water, and near-shore fisheries.

2- Enhancement of institutional capacity

This policy is to build adequate human capacity and skills in institutions responsible for policy formulation and planning, regulation and monitoring and operation.

To ensure this policy it is necessary:

- a) Establishment of an energy department or unit within the national ministry responsible for energy at national level

This energy department should at least:

- Gather all data related to production and consumption of energy sources in all sectors and produce and disseminate statistics.
 - Ensure public availability (particularly in a website) of at least, information on the energy sector, of legislation ruling the sector or applicable to it, on decisions adopted and on the national energy policy;
 - Review and propose a national energy policy;
 - Be responsible for long term planning to ensure compliance with the national energy policy;
 - Have resources to outsource studies and advisors on any matter and nature (financial, technical, etc) as necessary to comply with the functions of the ministry.
 - Implement mechanisms of consultation before the adoption of major decisions or policies, including this national energy policy.
- b) Create an adequate framework of cooperation and coordination of policy between the national authorities and the authorities of Nevis, through the creation of a special committee or commission, composed by representatives of the ministries responsible for energy (and possible also for sustainable development). Functions and powers of this committee might include:
 - (i) advice and assist the Ministry in the formulation and review of the National Energy Policy;
 - (ii) advice, assist and make recommendations to the Ministry on:
 - efficiency in all sectors;
 - reviewing and amending the energy planning;

- actions necessary for the implementation of the National Energy Policy and attainment of the objectives;
- actions necessary for the promotion of investments in renewable energy alternatives and energy efficiency in all sectors;
- any aspect related to the electrical interconnection between the islands of Saint Christopher and Nevis, and between them with other countries and islands of the region;
- any other issue linked to the National Energy Policy adoption and implementation.

(iii) Identify

- all aspects related to the promotion of use of renewable energy sources and energy Identify and propose:
- studies and analysis related to the potential, economic and technical feasibility of different renewable energy technologies and sources available in the country;
- actions related to information and education campaigns necessary for the attainment of the objectives of this National Energy Policy;
- any other aspect related to the formulation, review and implementation of the National Energy Policy.

(iv) Ensure an institutional framework of cooperation and coordination of policies between the federal authorities and the authorities of Nevis, and between the country with other countries of the region and regional institutions;

(v) Co-opt a person to prepare any kind of studies or to advise it on matters of a technical or financial nature as necessary to carry out its functions and powers.

(vi) Give a recommendation on the option of joining ECERA.

c) Implement a programme of capacity building to the ministries responsible for energy, at national level and within the Nevis Island Administration.

d) Establish one or more regulatory commission.

It is necessary to take a decision on whether or not being party to the Eastern Caribbean Energy Regulatory Authority (ECERA).

If the decision is not to join ECERA, a local regulatory authority needs to be established (one for the whole country or one for each island). In this last case, the legislations providing for the creation of the Public Utilities

Commission should be revised in order to provide for regulatory authorities politically and financially independent.

- e) Strengthen management and financial capabilities of SKELEC and NEVLEC.
- f) Improve transparency and public availability of data in the whole administration.

All ministries and entities of the administration should ensure public availability (particularly in a website) of at least, information on the sectors under their responsibility, of legislation and regulation ruling those sectors. That should comprise the adoption of mechanisms of consultation before the adoption of major decisions. Ministries should also adopt the regulations necessary to implement the acts and to detail requirements to comply with the acts, and to obtain licences, permissions or any kind of authorisations or approvals.

3- Renewable energy

This policy has the objective of promoting the deployment of renewable energy sources in all sectors, and to substitute the use of hydrocarbons by renewable energy sources and technologies in all sectors.

This policy requires:

- a)** Adequate electricity short, mid and long term planning.
- b)** In electricity, it is necessary to analyse and determine options to replace electricity production from fossil fuel by a production from renewable energy sources in order to determine the optimal electricity portfolio. This requires the following:
 - Prepare or outsource all studies analysing the potential, advantages (in terms of costs, environmental advantages, if they may be used as base load, etc) of all renewable energy options, including wind, geothermal, solar, biomass, small hydro and marine.
 - Identify associated infrastructure requirements (development of distribution networks, interconnections between both islands, etc) and investments needed.
 - Decide the optimal portfolio for producing 100% of the country' s electricity needs from renewable energy sources;
 - Adopt amendments to the Saint Christopher Electricity Supply Act 2011 and to the Nevis Electricity Ordinance;
 - Implement the schemes of promotion of power generation from renewable energy sources (including net metering, feed-in-tariffs, quota obligations, etc.)
 - Complete the legal framework through the adoption of all necessary regulations (for connection and use of networks, security, environmental obligations, etc.)
- c)** Analyse and determine options to replace the use of fossil energy sources by renewable energy sources and energy efficiency in all in all sectors consuming energy, including in the industry, commercial and domestic sectors (e.g. water heating and cooling), transport, agriculture, etc.

As some of these technologies have important up-front costs, these actions should identify measures for facilitating financing (e.g. promote loans from public or private entities or from funds).

- d)** Promote the use of renewable energy sources and technologies in domestic, industrial, agriculture, commercial and other sectors (e.g. for water heating, cooling, etc.)
- e)** Promote the participation of the private sector and of consumers in investments in renewable energy options and technologies.
- f)** Implement waste-to-energy programmes when the options and technologies available for the transformation of the diverse type of wastes is the adequate and an adequate and environmentally friendly option. This will require the adoption of environmental regulations establishing which kind of wastes may be used for the production of energy, including biofuels, biogas and electricity.
- g)** Facilitate short and long term education programmes related to renewable energy technologies and training requirements.
- h)** Identify needs related to public awareness and education campaigns.
- i)** Facilitate and investigate options related to research and development in the areas of renewable energy technologies, in particular in solar, geothermal, biofuels and biogas.
- j)** Establish regional cooperation with regard to sharing information related to research, development and training, and share information about results of policies and of pilot projects in new technologies (for instance, electric cars).
- k)** Identify local, regional and international entities that provide funds for energy renewable energy projects.

4- Electricity sector

As St. Kitts and Nevis have abundant renewable energy resources, including some that may be used as base load, the policy is to ensure the goal of producing 100% of the country's electricity needs from renewable energy sources is feasible and at lower costs by (2020).

But this action requires the following:

- a) Adequate electricity short, mid and long term planning;
- b) Decide the optimal portfolio for allowing the country to supply 100% of the its electricity needs from renewable energy sources by (2020);
- c) Adoption of an appropriate, complete and consistent legal framework ruling electricity, including:
 - Amendments to the Saint Christopher Electricity supply Act 2011 and the Nevis Electricity Ordinance
 - Adoption of regulations necessary to ensure access and use of electricity networks to producers and auto-producers generating from renewable energy sources.
 - Adoption of regulations ruling many other technical issues, such as dispatching, system operation, security and safety, etc.
- d) Allow and promote the role of the private sector and of consumers in electricity generation from renewable energy sources.
- e) Adopt adequate tools for financing new power production installations, In this regard the proposals of amendments of the acts ruling the electricity sector include:
 - A net metering or a net billing system that may be implemented in the short term by SKELEC and NEVLEC.
 - Provisions allowing the ministry to adopt further schemes of promotion of power production from renewable energies internationally used, such as feed-in-tariffs, premium tariffs, tenders, and mandatory quotas.
- f) Analyse and propose adequate financing options to develop all associated infrastructure (upgrade and development of distribution networks, interconnection between Nevis and St. Kitts, etc).
- g) Adopt the necessary legal, financial and administrative measures to allow the development of submarine interconnection between St. Kitts

and Nevis which will allow the supply between both islands of electricity produced from geothermal and other renewable energy sources.

- h) Appoint institutions responsible for monitoring and regulation (either ECERA or local regulatory authorities).
- i) Ensure the financial viability of NEVLEC and SKELEC and that they have the necessary financing resources to make investments in transmission and distribution upgrade and development, as necessary to:
 - Allow an optimal penetration of electricity produced from renewable energy sources;
 - Allow and adequate operation of the transmission and distribution electricity networks, and of system operation;
 - Make the necessary investments to decrease technical and commercial losses and increase efficiency of operations.
- j) Analyse the convenience, opportunities, as well as financial and other requirements for exporting electricity produced from geothermal energy to other islands and countries.

5- Build a complete and coherent legal framework

The establishment of instruments of promotion of renewable energy sources for electricity production requires a complete and coherent legal framework, which includes acts and regulations.

This action requires the following:

- a) Amendment of the Saint Christopher Electricity Supply Act 2011 and the Nevis Electricity Ordinance.
- b) If the country decides not to join ECERA, the amendment of the Public Utilities Act (St. Kitts) and of the Public Utilities Commission Ordinance (Nevis) is necessary to ensure a more suitable governance framework. In this regard, both legislations provide for the creation of regulatory authorities fully dependent, politically and financially, of the central administration. By contrast, the creation of independent regulatory authorities is highly recommended. Independence has two major aspects: political independence (from the central government and political authorities) and independence from the industry participants.
- c) Adoption of regulations on electricity
It is necessary to adopt regulations electricity, in particular on the access and use of electricity networks of the utilities, on safety, security and health, on dispatching and balancing, etc. Many of these regulations are mentioned in the amended sections included in the proposals of amendment of the Saint Christopher Electricity Supply Act 2011 and of the Electricity Ordinance.
- d) Adoption of regulations necessary for the implementation of renewable energy promotion schemes.
- e) Adoption of environmental regulations and regulations by the authorities responsible for environment, detailing requirements related to different power production installations differentiating between technologies/ energy sources, installed capacity, and other elements. These regulations should establish more detailed environmental standards and clarify about the criteria and requirements for preparing environmental impact studies.
- f) Adoption of environmental regulations related to the management and disposal of different type of wastes. As waste management is a major environmental problem, authorities responsible for environment should

determine by regulations the permitted or mandatory options for the management and disposal options for each kind of waste. These regulations should be permanently reviewed as the technologies changes and more environmentally friendly options are available.

- g) Standardised procedures which include transparent criteria and mandatory deadlines for the administration should be adopted and implemented. They should at least be used for any application related to the issuance of a licence necessary for power generation from renewable energy sources.

6- Energy efficiency and conservation;

This policy is to promote energy efficiency and conservation in all sectors. This will require to:

- a) Adopt guidelines on labelling of all energy-related products and of some non-energy using products which have a significant potential to save energy once in use or installed.
- b) Review and if necessary amend and/or adopt of mandatory standards applicable to lighting, equipment, motors, appliances, etc.
- c) Review and if necessary amend and/or adopt and building codes.
- d) Review and if necessary amend and/or of mandatory building codes.
- e) Prepare and enact energy efficiency legislation;
- f) Promote and implement energy audits.
- g) Implement programmes of energy saving and energy efficiency in the domestic, commercial, industrial, government, and other energy intensive sectors.
- h) Identify and adopt measures of all kind (legal, technical, administrative) to decrease losses in electricity;
- i) Prepare campaigns of information to the public and consumers education programmes.
- j) Monitor the compliance with mandatory standards and building codes.
- k) Identify actions and tools to reduce barriers for increasing energy efficiency.
- l) Identify actions and financial options for stimulating the replacement of energy intensive equipment, appliances, motors and machinery used in industrial, domestic, commercial sectors, in transport and any other sector.
- m) Conduct demand side management programmes.
- n) Review the electricity tariff structures and rates of NEVLEC and SKELEK, and ensure that they do not grant economic incentives to those companies to promote electricity waste and intensive use of energy. If the economic profits of the utilities are somehow linked to the amount of electricity sold to consumers, they will not have incentives to get involved in the promotion of energy efficiency

among consumers and, by contrast, will try to sell as much electricity as possible and to promote the intensive use of electricity. And that is against of the goal of any energy efficiency policy. Energy efficiency requires the involvement of utilities and to ensure that they have all kind of incentives, including economic incentives, to promote energy efficiency and energy conservation.

- o) Analyse and adopt measures for increase energy efficiency in transport.
- p) Identify local, regional and international entities that provide funds for energy efficiency projects.

7- Use of energy in transport

This policy is to promote energy efficiency in transport and the use of alternative energy sources and technologies.

This policy requires to:

- a) Analyse possible energy savings that might result if a more suitable land public transport system were established. It will be necessary to identify necessary investments, environmental and social advantages, and alternatives for the organisation of such an improved transport system in both islands and between them.
- b) Promote the use of fuel efficient vehicles through public awareness campaigns, labelling and analyse the adoption of mandatory standards for the import of vehicles.
- c) Analyse the economic and technical feasibility of promoting the use of cheaper fuels such as CNG and biofuels.
- d) Analyse the feasibility and convenience of importing and using electric cars in St. Kitts and in Nevis.