Proposal for Energy Policy of the Republic of Seychelles, 2010 – 2030

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Approach to an Energy Policy for Seychelles

Background

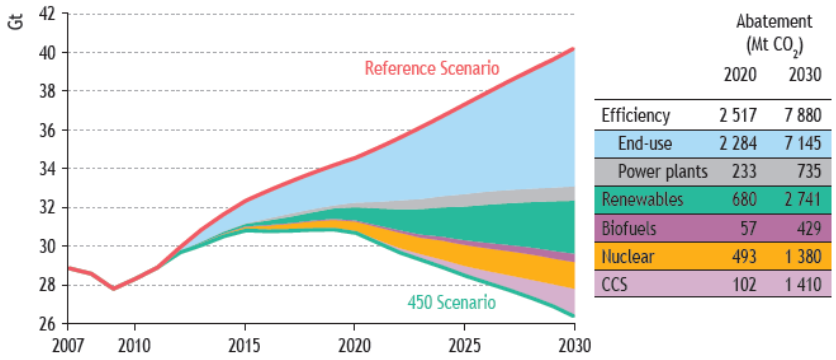
Ever since the oil crises of the 1970's and 1980's, security of supply has been an important issue in the formulation of national energy policies. Since the Rio Summit of 1992, climate change has also been high on the agenda.

In August 2009, Fatih Birol, Chief Economist of the International Energy Agency (IEA), stated in an interview with The Independent that "catastrophic shortfalls threaten economic recovery, mainly because of the rates of the declining oil fields". Furthermore, Dr. Birol said that even if demand remained steady, the world would have to find the equivalent of four Saudi Arabias to maintain production, and six Saudi Arabias if it is to keep up with the expected increase in demand between now and 2030.

In the Executive Summary of *The World Energy Outlook (WEO)* presented by IEA in November 2009 (WEO 2009), it is stated that "the scale and breadth of the energy challenge is enormous – far greater than many people realize" - and, furthermore, that "households and businesses are largely responsible for making the required investments, but governments hold the key to changing the mix of energy investment".

The WEO report presents two global scenarios for energy sector development towards 2030: (i) a reference scenario and (ii) a "450 ppm" scenario. Under the reference scenario, the global mean temperature rise will be 6^{o} C and the price of oil will approach 200 USD per bbl. In the alternative 450 ppm scenario, it is probable that the global temperature rise will be kept below 2^{o} C and that average oil prices will remain below 150 USD per bbl. In 2030, the marginal abatement cost is expected to exceed 100 USD per tonne CO_2 under the 450 ppm scenario.

Figure 1 shows the estimated required measures that will take the world from the reference path to the alternative development path (the 450 ppm scenario) in the most efficient way. The dominant instrument is increased energy efficiency, mainly in end-uses. Other major instruments, in the global context, are renewables, nuclear power and technologies for carbon capture and storage (CCS).



Abatement (Mt CO_2)	2020	2030
Efficiency	2 517	7 880
End-use	2 284	7 145
Power plants	233	735
Renewables	680	2 741
Biofuels	57	429
Nuclear	493	1 380
CCS	102	1 410

Figure 1: CO_2 abatement policies in the IEA 450 Scenario

Total CO_2 emissions under the 450 scenario are 14 GT below the reference scenario emissions. The power sector alone contributes 9,3 GT, or 70%. Biomass and wind power are the two main renewable sources – but photovoltaics, concentrated solar power and geothermal energy will also provide significant contributions, as can be seen in **Fejl! Henvisningskilde ikke fundet.**.

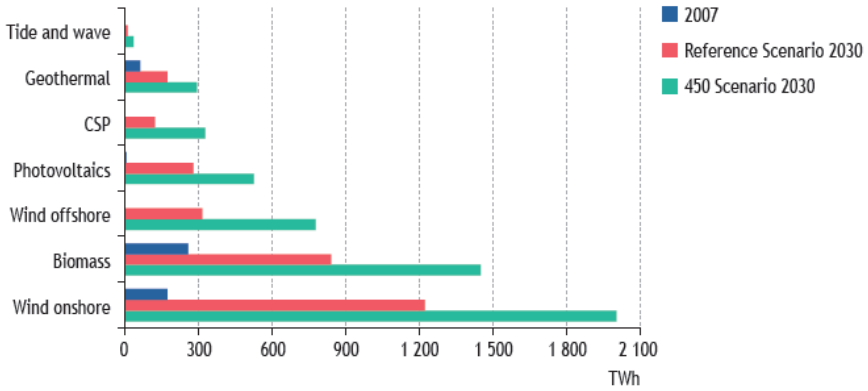


Figure 2: World electricity generation from non-hydro renewable by type in the WEO 450 Scenario

One conclusion to be drawn from the two scenarios is that the world can choose between two development paths:

- A "business as usual" scenario, with a dramatic rise in the world mean temperature over the long term and with high oil prices before 2030. The price of gas and coal will also rise under this scenario. The consequences of the temperature rise will be insurmountable for some countries.
- An alternative scenario with focus on energy efficiency and deployment of renewable energy, nuclear energy and CCS

technologies. Under this scenario, the marginal CO2 abatement cost will exceed 100 USD per ton in 2030.

Seychelles

The Republic of Seychelles is a Small Island Developing State and has no significant impact on global CO_2 emissions or on the consumption of fossil fuels. Also, Seychelles has no obligation to reduce its greenhouse gas emissions under the Kyoto Protocol.

High oil prices over the 2007-08 period hit Seychelles particularly hard, as existing high levels of foreign debt increased at an accelerated level over that period. The economy of the country is dominated by the service sector, which contributes approximately 70% of the GDP. Tourism continues to grow in importance. According to the Government's Strategy 2017, tourist arrivals will more than double to about 360 thousand in 2017. Most of the country's industrial output serves the domestic market with the export of fish products, especially canned tuna, being the exception.

In Seychelles, almost 100% of the energy supply is based on oil products, imported and resold by Seychelles Petroleum Company (SEPEC). In **Fejl! Henvisningskilde ikke fundet.**, the evolution of Total Primary Energy Supply is shown from 1997 to 2007 measured in Thousand Tons of Oil Equivalent (KTOE).

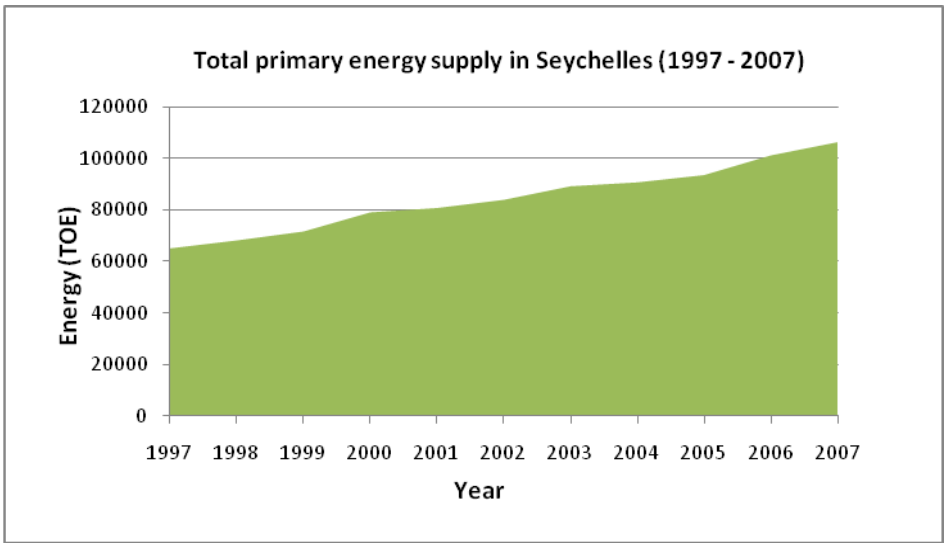


Figure 3: Total Primary Energy Supply in Seychelles (1997 – 2007)

The Public Utility Company (PUC) is a parastatal body established under the PUC Act and is the sole producer and distributor of public electricity. . In 2009,

the Government signed a two-year contract with SUEZ Energy of France to manage PUC. Electricity on the main islands of Mahé, Praslin and La Digue is generated using internal combustion engines running on fuel oil and gas oil. The supply of electricity on the other islands is from small gas oil operating engines and is the responsibility of each island's owner. Tourism activities (hotels) are the main consumers of electricity on these islands.

Even without formal obligations to abate greenhouse gases, the Republic of Seychelles has a clear interest in decreasing its almost 100% dependency on petroleum products for energy. Historically, oil has been the most cost effective way to supply the country with electricity, transport and the majority of other energy services. However, the oil price surge of 2008 showed that dependence on one type of fuel is risky and can shake the economy. The ability to supply energy at reasonable and predictable prices is a key issue.

In the context of ever increasing prices of fossil fuels and taking into account their impact on the environment, it is important to chart out an energy policy and formulate strategies for the short-to-medium and long term that would reduce, as far as possible, the reliance on imported oil for electricity production and transportation. However, such policy needs to be balanced and should factor in long-term fuel prices after removing volatility as well as risks.

In 2007, one third of oil imports were used for transport purposes and almost two thirds for electricity production. Only about ten percent was used for direct consumption in the industry, commercial and domestic sectors.

Due to increase in oil prices, the share of oil imports has risen from approximately 2,5% of GDP in 1997 to 10% in 2008.

In spite of an annual oil consumption that exceeds one ton per capita, Seychelles is a relatively energy efficient country in an international context. This is probably due to a combination of several factors, including low penetration of energy intensive industry, low consumption in households and an efficient public transport system.

However, electricity consumption is rapidly increasing, especially in the domestic, commercial and Government sectors. Increased use of air conditioning is probably a main reason for this growth.

Based on the historical evolution of energy consumption in Seychelles, and by linking consumption to economic activity, energy consumption can be forecast. By certain measures, the Seychelles economy has grown by an average of 4% over the last ten years . If this development continues, the import of oil products will more than double to 220.000 TOE before the year 2030.

Task force on energy security

As it is clearly stated in the report of the task force on energy security prepared for the Ministry of National Development in December 2008 and in other papers, the overall challenge in the energy sector is how to supply a growing demand for energy in a secure and sustainable way.

In this context, sustainability is about environment and climate, as well as economy and affordability. The main problem seems to be the almost 100% dependence on oil products, all of which are imported today.

In 2008, world oil prices surged to more than 140 $ per barrel, hitting Seychelles particularly hard. In November 2009, when oil prices were back to price levels of around 70 $ per barrel, the International Energy Agency (IEA) released its 2009 edition of the *World Energy Outlook*. In this publication, the IEA warns that crude oil is likely to rise towards 200 USD per barrel before 2030 if the world does not change its path towards sustainable development.

Five Pillars for sustainable development

Being a small state, Seychelles does not have much influence on the development of oil prices. The Seychelles can, however, decrease its dependence on oil. The foundation for decreasing oil dependency in a sustainable way will rest on five pillars:

(i) Set up a vision for the sustainable development of the energy sector in the medium and long term - and embark on a Plan of Action to follow this path.
(ii) Improve the Government's knowledge base for developing overarching long-term energy strategies and guide stakeholders in decision-making.
(iii) Change the framework to improve both public and private initiatives in the energy sector.
(iv) Focus on increased energy efficiency and thereby reduce waste of energy. It is internationally acknowledged that increased energy efficiency will be the main contributor to sustainable development.
(v) Launch programs for increasing the contribution from renewable energy in the energy matrix in Seychelles.

The necessary policy for further development of the energy sector should be comprehensive in order to sustain a constant movement towards increased energy efficiency and renewable energy and, at the same time, be flexible and adaptable to meet new challenges and opportunities as they arise.

1.1 Vision for the energy sector development towards 2030

- Basic energy services must be affordable to the whole population
- The energy base will be diversified. In the long term, energy supply will be 100% based on renewables. In 2030, the target is 15%; in 2020, it is 5%.
- Energy supply in Seychelles will be based on both public and private participation and ownership
- Energy supply must not give rise to pollution exceeding critical levels.
- Demand for energy services should always be met with the most energy efficient technologies. The aim is to decrease energy intensity by at least 10% in 2020.
- Oil will continue to be the predominant energy source for many years. For security reasons, the country must have access to at least 9 months stock of petroleum products at all times.
- Energy will be priced to consumers at its true cost
- Investments will be made to reinforce the image of Seychelles as energy conserving, greenhouse friendly and sustainable
- The energy vision for Seychelles will be reviewed and adjusted based on cross-sectoral energy scenarios.

1.2 Core elements in an Energy Strategy for Seychelles

The three dominating areas for targeting change are *land transport* and the *consumption and production of electricity*. Land transport and production of electricity count for more than 80% of oil consumption in Seychelles. The consumption of electricity can be expected to grow at a tremendous pace in the future if due action is not taken.

Land transport

When considering the potential to change the efficiency of a vehicle fleet, the rates of turnover are crucial. New registrations in each year are about 10% of the existing fleet in Seychelles. This applies to cars, buses and commercial vehicles averaged over 15 years.

The penetration of any changes in vehicle type or fuelling into the overall fleet in Seychelles will therefore take a considerable time to make an impact, with the exception of the very small number of motorcycles, whose turnover will be relatively quick.

Public transport

The key policy direction for land transport in the Seychelles is to ensure that the full benefit and efficiency gains are secured through public transport (essentially buses). This involves several actions.

The first is to ensure that the bus fleet is energy efficient, accessible and attractive to the users. Given the age of much of the SPTC fleet, and consequent maintenance issues, progressive re-equipment would allow the currently viable service to be maintained, the further growth of private motor vehicles to be limited, and the economic future of the most efficient form of transport for general mobility to be assured.

Private transport

Approaching the transport energy issues from the perspective of private motor vehicles, the fixed costs dominate the use of private transport. There is room, through judicious adjustment of taxes, for raising the fuel (variable) costs significantly, and dropping at least some of the fixed costs to encourage more appropriate use of the current vehicles and the taxi and bus alternatives.

Such an adjustment would require coordination between fuel taxes and import levies to ensure that the funding for the bus system can be secured. The import regulations will need to be reviewed to encourage more efficient small diesel and petrol vehicles in the short and medium term, and consideration should be given to relaxing the requirement that private motor vehicles need to be new.

Biofuels and LPG

Small amounts of bioethanol or biodiesel (respectively) can be added to existing fuels (up to 5% is permitted in the fuel specifications), but this would have a very small effect. A larger effect can be secured by providing dual fuel LPG/petrol conversions if LPG prices make this an attractive alternative. Similarly, up to 15% ethanol can be used to operate many cars, but many

vehicles, especially older ones, would require a number of seal changes to be able to operate reliably. The potential to source and use comparatively small quantities of biofuels, and indeed of LPG, are worth examining. In particular hotels should be encouraged to process their own wastes of biodiesel.

Electric vehicles

Electric vehicles (Evs) offer a range of opportunities. All the Islands are relatively small, and present no real problems with the range of present day EVs. Currently, both the costs and the slow rates of change of the vehicle fleet suggest that any significant use of electric vehicles is some way into the future, as several years of operational experience will be required before the prices start to decrease.

Two wheelers

Distances in Seychelles are comparatively small, but the hills on Mahé are substantial and steep,which discourages bicycle use. However, electrically powered bicycles are now available. Exploratory trials of such vehicles would be sensible to determine the acceptability, safety and attractiveness of such economic and low cost transport and to better define the role that they might play in Seychelles. As they would be attractive also to tourists, the tourism authority would have an interest. The low capital cost and simplicity of these vehicles has made them extremely popular in China and other countries.

Where there are special reasons for presenting a 'green' image, such as Praslin, the small size of the island combined with the policy of presenting it as a sustainable environment, makes it an excellent candidate for targeted trials.

Keeping a high penetration of public transport, targeting fuel efficiency and biofuels in import regulation, and moving towards electric vehicles and two-wheelers, have the potential to reduce oil imports for transport purposes by 15% to 30% (or perhaps more) by 2030 compared to the baseline. In addition, some of these policies have the potential to increase mobility due to reduced congestion on main in-roads to Victoria.

Electricity consumption

Electricity consumption is growing rapidly in Seychelles. According to international experience energy conservation is one of the most cost effective ways to reduce the consumption of fossil fuels.

Rapid growth in consumption is mainly caused by increased use of:

(i) Air conditioning, refrigeration, freezers, appliances and hot water geysers in the commercial sector.
(ii) Air conditioning, computers and appliances in the Government sector
(iii) Appliances, lighting and cooking in the domestic sector

In the future, it is expected that usages in all these consumption areas will accelerate. In addition to this, there is a danger that electricity consumption for air conditioning and hot water in the domestic sector and desalination of water in the Government and commercial sectors will increase dramatically as well.

Incentives

Regarding incentives for energy conservation, the relevant policy mechanisms include informative, economic and normative mechanisms plus voluntary agreements. Informative mechanisms aim to enlighten or influence the choices of the target group. The target group has freedom to choose whether they wish to act in accordance with the information or not. Economic mechanisms (e.g. taxes, levys, and grants) provide the target group with an economic incentive to behave as the regulator wishes (the "carrot and stick" approach). Normative mechanisms steer the target group towards a desired behavior and typically include sanctions in case a dictated norm isn't adhered to. The normative mechanisms can, for example, remove unwanted products and promote new energy efficient solutions (e.g., building regulations, minimum standards). Voluntary agreements are based on a dialogue between the authorities/regulator and the target group, which results in an agreement on targets and, to some extent, on how to reach the target.

Building code

According to Government strategy, a substantial amount of new buildings will be erected in Seychelles over the coming years for domestic, tourism and commercial purposes. Substantial savings in cooling needs and electricity consumption for hot water can be achieved with minor extra costs if houses and hotels are built according to an appropriate "tropical building code". Such a code should therefore be prepared with high priority and include provisions for the installation of solar hot water systems.

Standards and labels

The performance of air conditioners, refrigerators and freezers varies substantially according to quality, make, maintenance and age. The Energy Efficiency Rate (EER) of such equipment is a measure for how much cooling or freezing the appliance produces for each unit of electricity consumed. Old and poor air conditioners can have EER coefficients below 2, whereas modern and high quality equipment can have coefficients in the range of 4 to 5. By

changing equipment or by better use of existing equipment, it is possible to save more than 50% on the electricity bill. It should be considered to avoid the import of equipment with low EERs by imposing minimum standards. Without standards, there is a danger that Seychelles will become a target for the import of lower efficient equipment from exporting countries.

For labeling to work efficiently in the domestic sector, it is beneficial to combine labeling with information campaigns, including the exposure of estimated accumulated electricity cost over the lifetime of the equipment.

Guidance and Audits

Small and traditional shops are without doubt a consumer group that should be targeted with guidance. It is not uncommon for such shops to have several aged coolers and freezers producing a substantial amount of heat that is subsequently cooled away in aged and inefficient air conditioners.

Energy audits should be arranged for larger consumers, including Government buildings, hotels, commercial centers and industries. Such audits could be combined with guidance on how to operate, maintain and regulate existing ventilation and air conditioning systems for energy efficient operation.

Hotels – voluntary agreements

Tourism is a key economic sector in Seychelles that is projected to grow substantially towards 2030. At the same time, hotels are large electricity consumers for air conditioning, hot water and other purposes. A Special efforts should be undertaken to make collective voluntary agreements with existing and coming operators to comply with a “Green Seychelles”. With such a policy, the hotels should commit to one of three alternatives: (a) Substantial and verifiable energy savings – and/or co-production of electricity, heating and cooling, (b) Installation of renewable electricity production on its own premises, or (c) Purchase of a certain percentage of renewable electricity from the public grid.

It is estimated that implementation of the policies outlined here has the potential to save 15% - 30% of electricity consumption towards 2030 compared to the baseline. In addition, these policies will result in overall financial savings in both the medium and long term

Electricity production

Electricity production on Mahé and Praslin takes place mainly in facilitiesowned and operated by PUC, and in privately owned facilities on both the outer islands and the main islands.

Heavy fuel oil is used in Mahé's Victoria power station and diesel oil is used in all other facilities. Electricity is produced with an efficiency of 35% to 38% and grid losses are in the order of 5%-10%. Thus, approximately 65% of the energy is lost in the form of heat. The cost of producing electricity in Seychelles is heavily dominated by the cost of fuel. Currently all power stations in Seychelles use four stroke technology which is cost efficient when capital costs are high and oil prices are low. Two-stroke technology has higher electric efficiency, but is more costly especially in sizes below 10 MW.

Utilisation of the heat loss

There is potential for utilization of the waste heat. In Victoria, two larger production companies burn oil for production of steam and hot water. This energy could potentially be produced as combined heat and power (CHP). CHP production in these facilities – if viable – could potentially save up to 5.000 tons of oil annually. Another option is to transform waste heat to electricity. The Organic Rankine Cycle has potential to produce electricity with 10% - 20% efficiency from waste heat.
Several hotels in the Outer Islands and other places produce electricity for own consumption. The heat loss here could be utilized for cooling purposes or maybe even for desalination.

Waste and biomass

The landfill at Providence on Mahé receives 35.000 tons or more of waste annually. This could be utilized as an important source of energy, having the equivalent of up to 8.000 tons of oil. The landfill itself produces landfill gas that could be extracted and used for electricity production. For the future, a waste incineration facility should be considered.

Other biomass resources are residues from industries, agriculture, old coconut plantations and similar activities. The viability of generating electricity from these residues remains to be evaluated.

Wind, sun and ocean power

Seychelles has ample resources of energy from the wind, the sun and the ocean. Windpower and photovoltaics are well-established and proven technologies with low technology risk. Different kinds of ocean power technologies such as wave power and Ocean Thermal Energy Conversion (OTEC) are still in the research and demonstration stage.

Analyses have indicated that all the mature technologies mentioned above are options to be considered. New and unproven technologies like OTEC or gasification of biomass should only be considered if special circumstances warrant it.

Legislative instruments

In order to pursue these options with efficient incentives, the Government must develop the necessary legislative instruments. Some technologies have the potential to reduce the overall production costs, but the most proven technologies, like wind and solar photovoltaics (PV), come at an extra cost, even when carbon financing is considered.

The Government of Seychelles should consider supporting the development of renewable energy and combined heat and power by use of the following instruments.

(i) Introduction of a "sustainability tax" on consumption of electricity for all consumers, including self-suppliers. A tax of 0,1 SCR/kWh will yield an annual sum of SCR 25 million to help prepare the electricity sector for the future.
(ii) Opening the grid for independent power producers at standardized conditions (rights and responsibilities).
(iii) Introduction of feed-in tariffs for renewable energy producers who are willing to sell their production to the grid.

It is estimated, that the renewable energy sources described above, *together with the necessary legislation, can contribute with 15% - 20% renewable energy in the supply matrix in 2030. Wind power and, in the longer term, PV, are expected to contribute substantially.*

1.3 Organizational and legislative challenges

In order to fulfill the long-term energy vision, it is necessary to take action regarding legislation, administration, energy strategies and to initiate several projects and processes.

Today, energy supply in Seychelles is dominated by two state owned companies, Seychelles Petroleum Company and the Public Utility Corporation. These companies, established under the Parastatal Corporations Act, function as the corporate arm of government.

The PUC is a corporation, but its economy is closely connected to the state economy. According to the PUC Act, the Minister responsible for Finance can lend public money to PUC, and he approves the PUC's annual budget. The at any time applicable tariffs are written directly into the Act, and can as such only be changed by parliament, which has happened several times since 1985. There is no guidance in the Act regarding methodology for tariff setting and PUC cannot enter into any contract exceeding SCR 500.000 without approval from the Minister.

This legislation has made it difficult for PUC to raise tariffs to a sufficient level for covering costs. The requirement for parliamentary approval highly politicizes the tariff setting process and the level at which tariffs is set. Also, it has been difficult to obtain approval for financing planned and needed additional production and transmission capacity.

Supply obligation and Private Producers

Permits for private producers are granted by PUC. Due to the difficulties encountered by PUC to acquire the necessary financing for new power facilities, not all demand for electricity in Mahé, Praslin and La Digue could be supplied from PUC in recent years. Also, it is not clear in the Act how the cost of facilities should be borne for remote installations, if PUC chooses to serve these installations at all. This has forced some hotels to establish their own production facilities, including reserve capacity, which is not the most cost efficient solution in most cases, as reserve capacity in such instances means purchasing a new stand-alone generating unit for standby purposes that is equal in size to the hotel's largest producing unit. The regulation for private producers in remote sites is described in section 54 of the current Act.

IPP's and Renewable electricity

The current legislation does not contain any specific guidelines regarding supply of electricity to PUC from independent power producers (IPPs). The possibility to sell electricity to PUC is not mentioned. It is unclear whether it is actually legal for PUC to buy electricity from independent power producers, even at negotiated tariffs. Clear and transparent IPP regulation would be beneficial for private involvement in the development of renewable electricity production (or any private electricity production).

Energy strategies and advice to Government

In Seychelles, almost all human resources with in-depth knowledge of strategic energy matters are employed in one of the two parastatal bodies, SEYPEC or PUC. These two companies appear very well managed with good planning capabilities in the context of their respective legislation and missions.

However, there is a clear absence of an institution with strategic capability, and ability to reasonably understand and translate to Government, the consequences of plans and proposals promoted by SEYPEC and PUC. Such an institution could also serve as advisor to the Government on long-term strategies, and liaise with international Governmental agencies on energy-related issues.

Complete Energy Statistics

Published energy related statistics are solely based on information from SEYPEC and PUC. SEYPEC collects information on all oil products sold in the domestic market. PUC submit statistics regarding production, transport and sale of electricity undertaken by themselves. Some of these numbers are available in annual reports and some are published by the National Bureau of Statistics (NBC).

Reliable and complete energy statistics are highly necessary for formulating energy policies. The interest of the parastatals is focused mainly on energy sales, not how efficiently the energy is consumed or for what purpose. However, this is important information for the policymaker. In addition, it can be assumed that 5% - 10% of electricity is produced by others than PUC, but this is not accurately recorded. The lack of reliable statistics can distort the perception of growth in electricity consumption.

Increased energy efficiency is normally considered the most cost effective and environmentally friendly way to supply energy services. Such activities need strengthening.

Options for organizational change

Considering that Government believes in the need for flexibility and adaptability to manage and adapt to change, and taking into account the vision, policy, strategy and parameters for putting policy into practice, further restructuring is called for, especially with the major issues and challenges the energy sector is still facing. As energy has become a keystone focus for the country, it is inevitable that some adjustments to organizational responsibilities and terms of reference will need to emerge.

The Ministry of Environment, Natural Resources and Transport must therefore assume the role of facilitator and regulator, rather than that of what is essentially the provision of services. It should therefore be more dedicated to formulating, coordinating, monitoring and evaluating the implementation of relevant policies and instruments. Based on the above-mentioned challenges

and based on best international practice the need to strengthen the following three important tasks is identified:

- Regulation of prices and services, including private participation in electricity supply
- Ability to develop coherent energy strategies and scenarios and ability to aid in revising energy-related legislation.
- Information to stakeholders and to public regarding efficient energy consumption and renewable energy options.

These tasks should be solved with the creation and strengthening of two important institutions:

- An independent *Energy Regulator (ER), maybe as part of the office of fair trade*
- An *Energy Agency* or *Energy Commission (EC), which is in the process of being established.*

The table below shows the main tasks in the energy sector and what changes in responsibilities is proposed. The table does not include services on the Outer Islands. It is proposed that the Energy Agency/Energy Commission work closely together with IDC to define individual strategies and plans for the energy supply in the Outer Islands.

Tasks in energy sector	Existing (2009)	Future
Approve Energy policy and energy strategies	Cabinet	Cabinet
Prepare background documents for energy policy decisions on request or by own initiative.	PUC/SEYPEC	EC
Import and domestic sale of oil	SEYPEC	SEYPEC
Transmission and distribution of electricity	PUC	PUC
Production of electricity	PUC & IPP´s	More focus on IPP
Responsible for updated information on energy imports, energy production and energy consumption (Statistics)	PUC/SEYPEC/ NSB	EC/NSB with data from stakeholders
Updated knowledge on all relevant energy aspects. Research, Information and training programs. Liaise with international agencies	Energy Affairs Bureau/PUC/ SEYPEC	EC in co-operation with stakeholders and NGO´s
Advice on energy efficiency and renewable energy including incentives.	Energy Affairs Bureau/PUC/ NGO´s	EC in co-operation with stakeholders and NGO´s
Define methodology and framework for energy pricing and tariffs, including IPPs	Cabinet	Cabinet
Oversee the management of public companies in the energy sector incl. evaluating of performance indicators.	Cabinet	ER
Approve prices and tariffs	Cabinet	ER
Propose and monitor overall health and safety regulations in energy sector	PUC/SEYPEC	EC/ER
Specific approval and monitoring according to overall health and safety regulations	PUC/SEYPEC	PUC/SEYPEC

Table 1: Responsibilities and tasks in the energy sector

This draft Energy policy should be seen as a proposal for guiding principles to be established for sanctioning necessary actions to be taken in the future, the consequences of which are never fully known in advance. For this reason, it is essential to monitor and evaluate policy actions after they have occurred. In

order to ensure that desired outcomes of the approved Policy are achieved, the effectiveness of the policy must be assessed in a review process. This process will also help to identify when a complete review or alteration is appropriate.

It is expected that after the first six months of implementation the action programme outlined below, the Minister responsible for Energy Matters will conduct an assessment in order to identify and rectify problems that become evident. Thereafter, policy reviews should take place as necessary based on results of the ongoing monitoring and evaluation.

1.4 Plan of action

The plan of action to address the vision and goals for changes is outlined in the tables below:

Legislation and organization			
Action		Main content	When
1,1	Energy Regulatory Act	Set up regulatory body (Maybe as part of Fair Trade Office) in order to regulate quality and price of electricity service. Mandate to call upon Energy Commission and private consultants for analyses and advice when needed.	2010
1,2	Energy Commission mandate and financing	Establish fully functional Energy Commission (Energy Agency) as part of the Ministry of Environment, Natural resources and Transport. The main tasks will be to develop coherent energy strategies and scenarios, aid in revising energy-related legislation and provide information to public regarding efficient energy consumption and renewable energy options. Maintain Updated knowledge on relevant energy aspects. Research, Information and training programmes. Liaise with international agencies.	2010
1.3	Electricity act	Change PUC act to Electricity act. Main issues to change are: · Define division of responsibilities between PUC (production, transmission and distribution) and Independent Power Producers (production). · Describe tariff methodology · Obligation for PUC to submit to public an Integrated Resource Plan bi-annually. · Develop rules for IPP connection (Grid Code).	2010 2010 2011

2. Energy Regulator			
Action		Main content	When
2,1	Tariff methodology	Develop methodology for the calculations of electricity sales tariffs for full cost recovery. To be approved by Minister of Finance.	2010
2,2	Quality of Service	Develop Key Performance Indicators (KPI's)	2010-2011
2,3	IPP access	· Memorandum on IPP access. Describe financial framework for solicited and unsolicited IPP´s. · Solicited IPP´s. Based on needs described in IRP plan. Open tender. Unsolicited IPP´s. If qualified Renewables: Feed in tariff when developed. All other: Right to export to PUC at avoided costs – based on negotiated contract. Contract approved by Regulator	2011-2012

3. Energy Commission (Energy Agency)			
Action		Main content	When
3,1	Energy Statistics	Develop and submit energy statistics to public. Including analysis of electricity demand in service sector, public sector and domestic sector	2011
3,2	Energy demand scenarios	Develop and submit energy demand scenarios for all sectors and submit biannually to public. Scenarios to be used by PUC for Integrated Resource Plan (IRP plan).	2011
3,3	IRP task memorandum	Write memorandums to PUC and SEPEC with special issues to be covered and analysed in the upcoming IRP plan and annual report to be submitted by those companies. Examples are: Security of supply, renewable energy integration, energy price forecasts, bio-ethanol etc.	2010
3,4	Work plan for DSM activities including prospects for financing	Work plan to address the main target groups: · Hotels, service sector and public sector (aircon, solar water heaters) · Domestic sector (lighting, appliances, solar water heaters) · Transport sector (public and private)	2011
3,5	Develop work plan for RE demonstration projects.	· Wind power demonstration plant · Grid-connected PV demonstration plant (large scale) · Landfill gas – business plan · Diversification of transport fuels trails · Coordination with Tourism Seychelles in areas where energy iniatives can reinforce the national priority of a 'sustainability' image projection	2011-2012 2012 2011

4. PUC			
Action		Main content	When
4,1	First IRP plan	· Develop IRP plan based on memorandum from Energy Commission. The plan must describe the development of the electricity sector in the short term (five years) and in the longer term (fifteen years), including grid expansion plan. The first plan can have focus on short term only. · The plan must include financing needs, targets for renewable integration, fuel mix and energy efficiency. The plan will go through a hearing process and be approved by the Minister. The plan also includes recent and ongoing projects.	2011
4,2	Grid code	· Develop grid code for IPP access to the grid on both Low Voltage level and High Voltage level. To be commented by stakeholders and approved by Regulator. The grid code must include framework for some IPP´s to contribute with reserves and ancillary services.	2012-2013

5. Transport			
Action		Main content	When
5,1	Biofuels (SEPEC + Energy Commission)	Evaluate incentives for including bioethanol, biobutenol and biodiesel in fuel mix in the short term (three years)	2011
5,2	Electric vehicles (PUC + Energy Commission)	Evaluate EV demonstration programme – including energy efficiency, grid supply and recharge location aspects	2010
5,3	Energy Efficient taxing component	Evaluate the consequence of a taxing system with a mileage performance and energy efficiency component, including usage and access regimes.	2011-2012
5.4	Public transport fleet review (EC and (Transit body)	Assess the capital and performance measurement needs to maintain and enhance the public transport fleet , its energy supply formats, accessibility and operational effectiveness	2011
5.5	Lightweight transport (EC)	Assess regulatory, usage, policy and externality barriers to greater use of bicycles and electric, and other light powered two wheelers	2011
5.6	Vehicle Importation review (EC and treasury)	Assess fiscal, environmental and energy policy impacts of current and possible changes to vehicle import regulations and charges	2011
5.7	Fuel use monitoring by usage sector (EC Stats Seychelles)	Specify the requirements to be able to determine and monitor the heavy and light diesel and petroleum usage by fishing, public transport, freight and land transport vehicles by type of vehicle and sector of usage to permit fiscal and regulatory impacts to be assessed prior and post any implementation	2011

6. Other actions			
Action		Main content	When
6,1	Building code	To develop and adopt an energy efficient building code. Addressing issues regarding cooling needs and hot water needs (solar and CHP). Special focus on hotels and Outer Islands.	2011-2012
6,2	Feed in tariffs	Develop feed in tariffs for renewable energy technologies.	2011-2012
6,3	Energy labels	Prepare the introduction of energy labelling/energy standards system for main energy consuming appliances. Lifecycle energy-cost calculator.	2011-2012
6,4	Energy Audits	Conduct Energy Audits in service sector, public sector and industry. Co-operation between Energy Commission, PUC, NGO´s and industries own specialists. Including business plans for CHP at Indian Ocean Tuna, Seabrew and others.	2011