DEVELOPMENT POLICY FOR RENEWABLE ENERGY BASED ELECTRICITY GENERATION: SRI LANKA

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1. INTRODUCTION

The Ministry of Power and Energy recently presented to the government the Energy Policy and Strategies of Sri Lanka. This contains, among others, policies and strategies for the development of conventional generation and non-conventional generation. The development policy on renewable based energy generation in Sri Lanka has to deal with both the traditional generation based on renewable energy as well as non-conventional renewable energy related development. Both these areas of generation system development need to be examined in the context of high electricity demand growth in the country and increasing environmental concerns.

Electricity Generation

When considering the electricity supply industry it had been dominated by renewable energy for many years until mid 1990s when it gradually turned in to thermal domination based on oil-fired power generating stations. By the year 2005 the proportion of energy from thermal power plants increased to 61% of the total electricity supply recording an average annual growth of 34% in thermal based electricity generation during the last 10 years.

Sri Lanka has been encouraging non-conventional generation systems for the last two decades with a greater visibility of its efforts being felt during the last ten years. These systems are mainly based on small-hydropower, wind power, dendro-thermal (biomass fired) and solar power. By end 2004 total non-conventional generation capacity was 77MW mainly based on privately owned small hydro plants and the 3MW wind power plant owned by the CEB. These plants contributed to 2.6% of the total supply. A further 108MW of small hydropower plants were under construction in 2004 while the CEB had issued letters of intent to another 164MW of capacity at that time.

Most of the off-grid non-conventional systems are small hydro schemes of which the cumulative capacity exceeded 1MW by end 2006 supplying over 5000 households. Solar home systems reaching a cumulative capacity of approximately 5MW have supplied over 100 thousand households by end 2006.

Electricity Demand

The demand for electrical energy in the country has been growing at an average annual growth rate of 6.6% during the last 10 years while the peak demand recorded an annual growth of only 5.5% indicating an improvement in the load factor. In 2004, the domestic sector contributed to 39% of the demand while the industrial and commercial sectors' share was recorded as 59%. Street lighting demand accounted for 2% of the total.

The growth in the electricity generation capacity never matched the increasing demand and hence the reliability of electricity supply has diminished over the years. Urgent attention of the government was drawn to this issue and there are number of parallel attempts being made to improve this situation by resurrecting and implementing large generation projects identified by the planners.

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2. ENERGY POLICY

The government recently accepted in principle the *Energy Policy and Strategies of Sri Lanka* which has given due emphasis to the development of both the conventional and non-conventional renewable energy based generation.

One of the key policy elements addressed in this document is promotion of indigenous resources in energy supplies. Document has also identified the relevant strategies to be adopted in order to achieve this objective. They are the following

- The use of economically viable, environmentally friendly, non-conventional renewable energy sources to be promoted by providing a level playing field in generation sector development
- Concessionary financing to be sought to implement hydroelectric projects which are not viable under normal commercial terms
- Necessary incentives to be provided to other non-economic non-conventional renewable energy resources where appropriate to ensure their contribution to the energy supply
- A separate facilitation centre dedicated to the systematic planning and promotion of non-conventional renewable energy sources will be established.
- Appropriate steps to be taken to ensure the development and efficient use of non-commercial energy supplies such as biomass.
- Research and development on adopting new technologies and practices to be promoted

Further, the policy has identified small hydropower, dendro power and wind energy as the three leading non-conventional forms of renewable energy sources to be promoted in Sri Lanka for grid connected electricity generation. The Government will endeavour to reach a level of **10**% of grid electricity generated to be produced using non-conventional renewable energy (NCRE) by **2015**.

The government recognises the principle that the natural resources are public goods and hence the associated benefits need to be passed on to all the citizens in the country. But in the interest of expanding the NRE technology penetration no resource cost will be charged for a period of 12 years from the date of commercial operation. Thereafter, while electricity utilities shall continue to pay NRE suppliers on the basis of avoided costs determined by the utilities and approved by the PUCSL, the Government shall charge a resource cost for the primary source of energy. The resource charges shall be used to finance incentives for further NCRE development through the Energy Fund.

3. STANDARDISED POWER PURCHASE TARIFF

In mid 1990s the utility introduced a standardised power purchase agreement (SPPA) for small grid-connected renewable energy based electricity generating plants less than 10MW providing an impetus to the development of the small hydropower sector in particular. SPPA bounds the utility to purchase power generated by these plants without a limitation at a predetermined "avoided cost" based tariff. Further, the generator is assured a minimum tariff of 90% of tariff in the first year of its commissioning. This led to the accelerated development of the grid connected small-hydro power industry.

The government has now recognised that certain NCRE technologies would require incentives to ensure their capacity build-up to contribute to the national NCRE target identified in the policy. These incentives need be technology-specific and based on actual energy production. Further these incentives need to be provided with no additional burden on the end-use customer tariffs or economics of the electricity supply business.

By recognising these aspects the government has recently declared that all new NCRE based generation projects will be paid a standardised technology specific cost based power purchase tariff. This tariff is designed to make sure that the developer will always have positive cash flow during the SPPA period of 20 years. Further, the tariff will be revised periodically to ensure gradual penetration of different technologies. While the utility is required to bear the "avoided cost" for the power it purchases from NCRE based generation, the government will provide any additional funds through the "Energy Fund" to bridge the gap between the cost-based tariff and the avoided cost. This new tariff is expected to encourage dendro

power and wind power based generation which tend to have costs higher than those can be recovered through "avoided cost" based tariff.

4. ENERGY FUND

In order to make available the incentives for higher cost NCRE technologies, the Government has already created an 'Energy Fund' which will be formalised in the near future. This fund is presently managed by the Energy Conservation Fund (ECF) but will be transferred to the proposed Sustainable Energy Authority (SEA) once formed. This fund is expected to be strengthened through an energy cess, grants received from the donors as well as the funds received under "Clean Development Mechanism (CDM)". Also energy fund will be utilised for other NCRE related activities such as strengthening the transmission network to absorb these generation technologies into the grid.

5. SUSTAINABLE ENERGY AUTHORITY

When dealing with the NCRE development issues Ministry of Power and Energy strongly felt the need to have dedicated agency with authority for NCRE development. Not only this agency needed to be able to facilitate the process of NCRE development but also it should have the statutory powers to intervene and overcome barriers.

In order to address this requirement the Ministry has already developed a new legislation to establish the Sustainable Energy Authority (SEA). This legislation is expected to be tabled in the Parliament in the near future. The board of directors of SEA will have representation from all important stakeholder state agencies. This will enable the authority to address many of the critical issues such as those involving land use and water resources, within its own.

ECF is expected cease its operations and take over the role of SEA along with the passage of the new bill.

6. CONCLUSION

While the government policy has always been in favour of the development of renewable energy, it has become stronger and more meaningful during the last ten years. The implementation of this policy has been greatly strengthened by the financial assistance provided through Energy Services Delivery Project and the Renewable Energy for Rural Economic Development project of the World Bank and other donor agencies from time to time.

The recent introduction of the technology specific cost based power purchase tariff offered to the NCRE based generation will undoubtedly help greater penetration of relatively expensive NCRE technologies such as dendro-power and wind power along with traditionally attractive small-hydro power development.

At the implementation level, the present policy needs strengthening in the area of industry regulation which is paramount for the development of not only the NCRE sector but also the whole of electricity industry.

It is concluded that these policies of the government should be vigorously implemented in order to ensure continuous development of the renewable energy sector of which small-hydro power industry is a major component.

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