Consultation Document

Proposed Non Conventional Renewable Energy Tariffs

General

The tariffs are cost-based and technology-specific. The technology applicable would be the "Type" of project stated in the "Permit" issued by the Sri Lanka Sustainable Energy Authority (SLSEA). For this tariff revision, Mini-hydro, Wind, Biomass (dendro), Biomass (Agricultural and Industrial Waste), Waste heat, Municipal Solid Waste technologies, are proposed. Competitive tendering is proposed to develop identified resources using Wind and Solar technologies, to achieve economies of scale.

Tariff Determination Process

In terms of Section 17 (b) of Public Utilities Commission of Sri Lanka Act, No 35 of 2002, Public Utilities Commission of Sri Lanka (PUCSL) has decided to consult the stakeholders in determining Feed-In-Tariffs for Non-Conventional Renewable Energy (NCRE) based electricity generation. In addition to the stakeholder representations, PUCSL will consider the General Policy Guidelines issued to the Commission and other Policies of the Government of Sri Lanka when determining the final tariffs to procure NCRE based electricity under Standardized Power Purchase Agreements (SPPA)

Areas for Stakeholder Representations

Stakeholder representations are sought for the items shown below. The representations shall be in writing and are expected only on the areas shown below.

- Proposed Policy of offering cost based technology specific purchase tariffs for aforementioned five technologies, and use of competitive tendering procedures to purchase electricity generated based on Wind and Solar technologies

- Parameters used for proposed tariff calculations;
    - Interest Rate,
    - Annual Return on Equity,
    - Capital Cost,
    - Annual Plant (Capacity) Factor,
    - Operation and Maintenance Cost,
    - Fuel Cost and
    - Escalation Factors

The proposed parameters to be used to calculate tariffs and how escalations are applied are given in the sections below. The excel model used to tariff calculation is available at http://www.pucsl.gov.lk/download/Electricity/SPP_tariff_2010.xls and the resulting Feed-In-Tariffs (see summary sheet) can be changed by varying the parameter cells marked in yellow (in the 'technology', WACC and Escalation worksheets).

Principles of Tariff Fixing

Profits to developers from first year: The cost-based, tiered tariffs provide pre-defined cash flows to developers. This provides the maximum returns to developers as most Small Power Projects (SPPs) enjoy at least a five-year tax holiday under Board of Investment concessions.

Benefits to Electricity Consumers in the long-term: This tiered tariffs provide benefits to the developers and the electricity customers through (a) predictability of the tariff and (b) lower-cost energy from Non-conventional Renewable Energy (NCRE) in the long term, respectively.

Principles of tariff structure:

(a) renewable energy should in the long-term produce electricity at prices below the cost of fossil fuel power plants.

(b) renewable energy, which is a natural resource, belongs to the State. Developers opting for the tiered tariffs are provided with a high tariff to cover their expenses and to earn reasonable profits for an adequately long period. Thereafter, the benefit of the resource should flow to the electricity customers.

Capacity Limit of SPPs

The SPPAs will continue to be limited to NCRE-based power plants with installed capacity up to 10 MW. Projects larger than 10 MW will not qualify for these tariffs or the SPPA, and they will be entertained through a separate process.

Implementation of NCRE Tariffs

The SPPA contains a schedule of tariffs applicable over the 20-year period. Commencement of the year one in the tariff schedule of the SPPA shall be the Commercial Operation Date.

The escalation rates for operation and maintenance costs for all types of power plant, and fuel costs for biomass and agricultural/industrial waste power plants, will be re-calculated and announced every year.

Key Inputs to this NCRE tariff calculation

This section gives the proposed benchmarks that may be used to develop the tariffs.

Capital costs and annual plant (capacity) factor: The proposed capital costs and the annual plant (capacity) factor to be used for the calculation of tariffs are as follows:

Technology	Capital Costs Rs. million/MW	Annual plant (capacity) factor
Mini-hydro	179	42%
Wind	212	32%
Biomass	189	80%
Agricultural and industrial waste	189	80%
Municipal Waste	284	80%
Waste Heat	189	67%

Debt: equity ratio and interest rates: A debt:equity ratio of 60:40 has been assumed. An annual interest rate of AWDR+5.5% has been used as the interest rate on debts, repayable in equal installments over six years. The Average Weighted Deposit Rate (AWDR) was taken to be the average rate of six months ending 28th February 2010 published by the Central Bank of Sri Lanka. The proposed interest rate so calculated is 15.44% per year.

Annual Return on Equity (AROE): In tariff calculations, a pre-tax annual return on equity of 14% is proposed to be allowed every year for a period of 15 years.

Discount rate: The discount rate used to levelise tier 1 and tier 2 tariffs as well as to calculate the 20-year levelised tariffs is the Weighted Average Cost of Capital (WACC) as calculated below:

$$\text{WACC} = \frac{\text{debt \% x interest rate\%} + \text{equity\% x Annual ROE\%}}{100}$$

As the debt:equity ratio assumed is 60:40, proposed interest rate is 15.44%, proposed annual return on equity is 14%,

$$\text{Discount rate } \mathbf{=} \ \text{WACC} = \frac{60 \times 15.44 + 40 \times 14}{100} = 14.86\%$$

Operations and Maintenance (O&M) Rate (base value): The annual O&M cost was defined as a per cent of the capital costs. The proposed base rates to be used are the following:

Technology	Annual O&M Cost as a percent of capital cost	Calculated O&M Base Rate* (Rs./kWh)	
Mini-hydro	3.0%	1.46	throughout
Wind	3.0%	2.27	throughout
Biomass	4.0%	1.08	years 1-15
	5.0%	1.35	year 16 onwards
Agricultural and industrial waste	4.0%	1.08	years 1-15
	5.0%	1.35	year 16 onwards
Municipal Waste	7.0%	2.84	throughout
Waste Heat	1.33%	0.43	throughout

* see below for proposed escalation rates

Escalation of O&M

The annual escalation rate for O&M is proposed to be the average of the rates of change of Colombo Consumer Price Index (CCPI) and the Rs./USD rates of change, for the five preceding years. The escalation rate in percent will be taken to two decimal places. The annual escalation rate announced for any year will be applied to all operational SPPs on the cost-based, three-tier tariff. In the year of achieving Commercial Operation, the base value of O&M stated above will apply, until 31st December of that year. Thereafter, O&M paid as of 31st December will be escalated by the annually announced O&M escalation rate.

The five-year average CCPI for the period 2005-2009 was 12.61% and the average depreciation of Sri Lankan Rupee against the USD was 2.66% over the same period. Therefore, the proposed escalation rate for O&M rate would be 7.64% for projects which were in operation before 1st January 2010.

> Note: For new SPPAs, these notes provide guidance to how the escalation rates will be calculated in the future, once their projects are operational. For SPPs already operational as of 31st December 2009, these notes provide the calculation of the escalation rate applicable to the O&M rates paid from 1st January 2010.

Fuel cost escalation for biomass and agricultural/industrial waste: The fuel cost of biomass SPPs payable on the Commercial Operation Date shall be the base rates proposed in this tariff revision.

Technology	Fuel Cost (Rs./kg)
Biomass (Dendro)	3.63
Biomass (Agricultural and Industrial Waste)	1.82

They are proposed to be escalated at a rate of 2/3 of the O&M escalation rate calculated shown above, starting from the 1st day of January occurring after the Commercial Operation Date.

Third Tier: The base rate to be paid from year 16 onwards is proposed to be 1.68 Rs./kWh. From the 1st day of January occurring after the Commercial Operation Date and on each 1st first day of January thereafter, this third tier rate will be escalated at a rate of 2/3 of the O&M escalation rate stated above. The escalations will be computed and compounded for fourteen years until the fifteenth anniversary of the Commercial Operation Date, and paid from year 16 onwards.