OFFICE OF THE REGULATOR

FEED- IN- TARIFFS POLICY ON RENEWABLE ENERGY SOURCES GENERATED ELECTRICITY

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Table of Contents

Contents

DEFINITIONS

In this Feed-in-Tariff Policy, unless the context otherwise requires, the following capitalized words shall have the following meanings:

i. "AGREEMENT" or "PPA" : power purchase agreement means the agreement between the Investor and the Off-taker together with any related agreement;

ii. "BUYER": Off-taker or purchaser of electrical energy from Feed-in-Tariff power plant.

iii. "COMMISSIONING" : the conduct of tests necessary to put a Unit or the Plant (as the case may be) into operation and supply to the grid;

iv. "COMMISSIONING DATE" : the date on which the developed power plant commences the operation of supplying electricity to the grid;

v. "CONNECTION POINT" : the point of common coupling at which the units sent out from the Seller's Plant (Net Electrical Output) is delivered into Buyer's system;

vi. "kWh" : abbreviation for kilowatt hour being three million six hundred thousand (3,600,000) Joules as defined in ISO 1000.1992(E);

vii. "MW" : abbreviation for megawatt being one thousand (1,000) kW;

viii. "OFF-TAKER" : the Buyer (Electric Power Corporation) of electrical energy for the purpose of selling the electricity to customers connected to the national grid systems.

ix. "PLANT" : Seller's electrical energy generating power plant ;

i. "SELLER" : Investor/Developer of Feed-in-Tariff power plant.

EXECUTIVE SUMMARY

1. Samoa has a great potential for the development of renewable energy sources (RES). The Government of the Independent State of Samoa ("GoS") has allowed this by opening the electricity market to Independent Power Producers (IPPs) to generate electricity under the Electricity Act 2010. Before its operations in 2011, the bidding process for IPPs has been negotiated by the Electric Power Corporation and approved by Cabinet. There was no particular RES Policy in place to guide this process. This resulted in high energy prices which impacted the electricity end tariff paid by consumers. Thus, any Governments who are serious about pursuing renewable energy need to seriously consider feed-in tariffs (FIT). With the era of clean energy upon us, it is time to start feeding the grid renewable power. The purpose of this FIT Policy is to assess how to expand further development of RES reaching the National energy targets with limited impact on the electricity prices.

   This Policy consists of two sections: an overview of the existing RES supports policies and elaboration of the new FIT structure for Samoa. First part of the Policy focuses on the historical development of RES promotion policies worldwide. This part explains how different FIT models work and describe the advantages and weakness of each model. Further, this part reveals that cost based FIT model is the most cost effective tariff structure applicable for Samoa. In addition, this section is also focuses on the economic benefits of RES, including impact of the investments and jobs. The purpose of the second part of the report is to elaborate FIT structure, which will

   i. Insure reasonable rate of return for developers

   ii. Insure application of state-of-art technologies and efficient utilization of scarce resources

   iii. Will have minimum negative impact on electricity prices on a sustainable basis.

INTRODUCTION

2. A FIT is an energy supply policy focused on supporting the development of new renewable energy projects by offering long-term purchase agreements for the sale of RE electricity. These purchase agreements are typically offered within contracts ranging from 15-20years and are extended for every kilowatt-hour of electricity produced. The payment levels offered for each kilowatt-hour can be differentiated by technology type, project size, resource quality, and project location to better reflect actual project costs and value for the electricity produced. Policy designers can also adjust the payment levels to decline for installations in subsequent years, which will both track and encourage technological change. In an alternative approach, FIT payments can be offered as a premium, or bonus, above the prevailing market price.

The Policy Framework

3. The GoS recognizes that renewable energy sources (RES) which include wind, biomass, biogas, hydro, solar and municipal waste energy, have potential to generate income and employment, over and above contributing to the electricity supply and diversification of generation sources.

4. The Samoa National Energy Policy 2007 goals are twofold, "to increase the share of mass production from renewable sources to 20% by 2030 and "to increase the contribution of Renewable Energy to energy services and supply to 20% by year 2030".

5. The Electricity Act 2010 ("the Act") objectives include the promotion of:
   (a) competition in the generation of electricity;
   (b) the use of new technology by service licensees to generate, transmit or supply electricity; and
   (c) to promote the prevailing national energy policies.

6. GoS's most recent national commitment on reducing greenhouse gas (GHG) emissions (Intended Nationally Determined Contribution) was declared on 1 October 2015 by establishing a target of generating 100% of its electricity from renewable energy (RE) sources by 2017 (UNFCCC, 2015).

7. Pursuant to these policy strategies and in recognition of the potential of renewable energy sources in Samoa, the Office of the Regulator ("OOTR") has encouraged potential Independent Power Producers ("IPPs") to carry out feasibility studies on renewable energy generation on the basis of which Power Purchase Agreements (PPAs) with the Off-taker can be negotiated.

The Feed-in-Tariff Instrument

8. A Feed-in Tariff ("FiT") is an instrument for promoting generating of electricity from renewable energy sources. A FiT allows power producers to sell renewable energy generated electricity to the Off-taker at a pre-determined tariff for a given period of time. The current RES in Samoa include wind, biomass, biogas, hydro, solar and municipal waste energy.

9. The objectives of the FiT policy are to:

a) Facilitate resource mobilization by providing investment security and market stability for investors in electricity generation from renewable energy sources;
b) Reduce transaction and administrative costs and delays associated with the conventional procurement processes;
c) Encourage private investors to operate their power plants prudently and efficiently so as to maximize returns.

10. The advantages of electricity from renewable energy sources include:

a) Environmental integrity including the reduction of greenhouse gas emissions (where feasible, project developers are encouraged to pursue carbon credit benefits);
b) Enhancing energy supply security, reducing the country's dependence on imported fuels, and coping with the global scarcity of fossil fuels and its attendant price volatility;
c) Enhancing economic competitiveness, job creation and other local economic benefits.

11. There is increased interest for investment in solar energy resource to supply the national grid. Recent trends show a significant decrease in solar generation equipment prices, which may have contributed to the increased interest in grid connected solar energy in Samoa.

12. One of the main purposes of this policy is to reduce the transactions costs associated with negotiating and signing a PPA.

POLICY STATEMENTS ON SPECIFIC ISSUES

13. For grid connected renewable generators of up to 5MW (5 megawatts) of installed capacity the power purchase agreement will be a Standardized PPA. While the tariffs offered are technology-specific, the Standardized PPA is technology-neutral. *Payment Differentiation by Technology:* Under a cost-based model, the price paid to a project will depend on the technology that is utilized, as the development and operation & maintenance costs can vary significantly depending on the method of generation. Differential payments also mean that technologies that are currently relatively high cost are introduced, which is problematic for developing countries since it conflicts with the objective of affordability

14. FiT values for small renewable projects are provided in the Appendix 1 to this policy. The following policy principles underlie the calculation of these FiT values:

a) FiT values are calculated from the levelised cost of electricity to be used as a methodology using the principle of cost plus reasonable investor return of maximum 10% with minimum ROI of 7%;

The levelized cost of electricity (LCOE) is given by:

b)
$$\frac{\text{sum of costs overtime}}{\text{sum of electrical energy produced over lifetime}} = \frac{\sum_{t=1}^{n} I t + Mt + Ft}{\sum_{t=1}^{n} \frac{\text{Et}}{(1+\text{r})}\ \text{t}}$$

***I*ₜ** : investment expenditures in the year *t*
***M*ₜ** : operations and maintenance expenditures in the year *t*
***F*ₜ** : fuel expenditures in the year *t*
***E*ₜ** : electrical energy generated in the year *t*
r : discount rate
n : expected lifetime of system or power station

c) the FiT is denominated in Samoan Currency (Tala-$SAT)
d) There is no escalable portion of the tariff; however it is adjusted for inflation and exchange rate fluctuations.

15. The cumulative capacity contribution by FiT projects shall not exceed 20% of system-wide generation capacity. When this installed capacity limit is reached, the Off-taker will consider undertaking a comprehensive study to determine a higher level of embedded capacity can be accommodated.

16. Electricity generation costs vary according to the RES-Electricity technology used.Therefore the FiT levels are technology specific and depend on:

a) The investment costs for the plant (including the costs of feasibility studies, site development, construction costs, and the costs of connecting to the transmission system including transmission lines, substations and associated equipment);
b) The Operations and Maintenance (O&M) Costs;
c) Fuel costs where applicable;
d) Financing costs (including interest during construction) and a fair return on the invested capital. The availability of concessionary finance will be taken into account when estimating such costs;
e) Estimated lifetime of the power plant;
f) Amount of electricity to be generated.

Table 1 : Methodologies for Determining Payment Structure

	Cost-Based (Project Cost + Profit)	**Value-Based (Avoided External Cost)**
Payment design	Includes the cost of renewable energy project, plus a return to investors as typically determined by program administrator.	Builds upon market-based products to include a premium based on the value of renewable generation to society.
Market interaction	The FIT payment is set and independent of fluctuating market conditions. Certain cost-based FIT payment structures are paid based on market price, with a premium administratively determined payment with floor and ceiling.	As the price of energy and electricity shifts, the total FIT payment shifts along with it.
Sale of FIT power	After entering into FIT contract, utility or program operator compensates FIT generator for electricity.	After entering into FIT contract, generators compete with each other to sell power.
Benefits	1. Higher investment security may lead to lower capital costs and diverse investors.2. Payment stability consistent with the cost	1. Ability to expressly incorporate external benefits, including avoided T&D and environmental costs.2. Lower payment levels lead to lower

	characteristics of the technologies.	ratepayer impact.
Challenges	1. Determining the right payment levels to avoid overpayment or failure to attract willing investors.	1. Investor profit and ROI uncertainty.2. Technology-neutral program may not encourage diverse renewable energy portfolio.3. Administration of payment may be time-consuming and complicated.4. Additional costs of dealing with intermittent supply—in terms of system support.

As it is clear from the analysis above, market-independent policies are providing a stronger and more cost-efficient policy option in the near-term than market-dependent options. Given the lower-risk and greater revenue certainty they provide, fixed price models have thus far proved to be more effective at encouraging broader participation in RE development, while providing a policy structure more conducive to leveraging large amounts of capital toward renewable energy development.

17. The FiTs are based on the actual generation costs in Samoa, but also have regard to the FiT policies in other parts of the world and the specific socio-economic conditions in Samoa.

18. FiTs are also based on the best estimates of different load factors of energy availability.

19. FiTs are grouped according to plant capacity as necessary. Linear interpolation will be used between groups to provide incentives for developers to opt for larger capacities than they might otherwise do. Larger capacities are in the best interests of the country.

20. The Government of Samoa guarantees access to the grid (Transmission and Distribution) pursuant to the provisions of the national Grid Code.

21. These tariffs shall apply for the term of the PPA from the date of the first commissioning.

CONNECTION OBLIGATIONS

22. The Feed-in-Tariffs values set in this policy include a standardised allowance for interconnection costs. The costs of interconnection, including the costs of construction and associated equipment, are to be borne by the developer.

23. The interconnection costs will be paid by the developer upfront. With prior arrangements, the Off-taker may construct or upgrade its grid at a reasonable economic expense to facilitate interconnection and meet all technical requirements and recover the associated costs from the Seller through the Feed-in-Tariff.

PURCHASE OBLIGATION

24. Subject to the costs being met by the developer, the Off-taker shall connect plants generating electricity from renewable energy sources.

25. The Off-taker shall guarantee priority purchase, transmission and distribution of all electricity supplied by renewable energy projects (capacity up to 5MW) as defined in this policy.

26. The Off-taker may recover from electricity consumers 85% of the portion of the feed-in tariff, or as may be directed by the OOTR at the time of approval of the PPA or review thereafter. The pass through costs shall enable the Off-taker to remain revenue neutral after contracting a Feed-in-Tariff power plant.

APPLICATION AND IMPLEMENTATION PROCEDURES

27. Renewable energy generators feeding into the grid will require a PPA. The project sponsor for such renewable generation projects must be an entity legally registered in Samoa, such as a private or public company, a limited liability partnership, a civil society organization, a trust, a public agency or government authority.

28. The procedures for applying for and implementing the FiT shall follow the Application and Implementation Guidelines, as published by the Off-taker, the first step being the submission of an Expression of Interest (EOI).

29. The applicant will be issued a formal letter of Intent by the Off-taker once negotiation process is agreed upon. The Off-taker will then notify the OOTR and send a copy of the letter of Intent.

30. The applicant will then submit application for generation licence as well as Draft Copy of PPA to the OOTR. OOTR will process application according to Regulatory requirements (including FIT).

31. The Regulator may approve/decline application for generation licence and PPA.

32. Once the application is approved, the generation licence will be issued and with approved PPA including final Feed-in Tariff that will be applied.

COMPLIANCE WITH TECHNICAL, LEGAL AND REGULATORY REQUIREMENTS

33. All projects implemented under the Feed-in-Tariff system shall comply with all other relevant technical, legal and regulatory requirements of Samoa.

34. In particular, projects will abide by the obligations under the Power Purchase Agreement and Connection Guidelines for Renewable Generation Plant as well as the National Grid Code.

REVIEW OF FEED-IN-TARIFFS

35. This Feed-in-Tariffs policy shall be subject to review every three years from the date of publication. However, a policy review may be undertaken earlier than three years in exceptional cases. Any changes made during such reviews shall only apply to RES-power plants that shall be developed after the revised guidelines are published. For the avoidance of doubt, FiT values applying to PPA entered into previously will remain unchanged.

APPENDIX – FiT VALUES

The FiT values for renewable projects (up to 5MW of installed capacity) connected to the grid.

RE Source	Installed capacity (MW)	Standard FiT (SAT $/kWh) Inclusive VAGST	Min. Capacity (MW)	Max. Capacity (MW)
Wind	1-5	<0.50	1	5
Biomass	2-5	<0.50	2	5
Biogas	2-5	<0.50	2	5
Solar	2-5	<0.50	2	5