

Implementing a Global Fund for Feed-in Tariffs in Developing Countries: A Case Study of Tanzania

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Abstract

Feed-in tariffs are the world's most prevalent renewable energy policy and have driven approximately 75% of the world's installed PV capacity and 45% of the world's wind energy capacity. Although approximately 28 developing countries have enacted national feed-in tariffs, market growth in developing countries has been slow because of a range of technical, regulatory, and financial barriers. This paper uses the Global Energy Transfer Feed-in Tariff (GET FiT) concept to explore potential international support for renewable energy in developing countries. This paper reviews the GET FiT concept and discusses the key mitigation strategies that it proposes to employ. The paper also provides a short case study of how GET FiT might be targeted to support a feed-in tariff policy in a specific developing country, Tanzania.

Keywords: global feed-in tariff, renewable energy, energy access, developing countries

1. Introduction

The world faces two critical energy challenges: global CO₂ must be stabilized at 450ppm to keep average global temperature from rising more than 2° C and 1.5 billion people do not have access to electricity in the developing world. Collaborative efforts between developed and developing countries are necessary to mitigate climate change, create economic development opportunities, and provide energy access through a greater use of renewable energy.

Feed-in tariffs (FiT) are the most prevalent national renewable energy policy globally, and have cost-effectively driven renewable energy (RE) scale-up by creating investor security [1]. Over the past 10 years, FiTs have supported a significant proportion of global RE capacity; in 2008 FiTs supported 75% of global PV capacity and 45% of global wind capacity [2]. As such, they are contributing to an unprecedented global boom in which new renewable energy capacity represented over half of total global investment in new power generation in both 2008 and 2009 [3]. Although western European feed-in tariffs receive the most attention, there are also 28 national FiTs in place in developing economies [2].

Renewable energy markets in developing countries face broad range of barriers, including technical constraints (e.g. transmission), regulatory and legal barriers, and financial risks which hinder access to capital. These barriers require well-coordinated suites of solutions and appropriate policy design. The presence of feed-in tariffs in developing countries has not been sufficient to drive large-scale renewable energy deployment to date because of a wide range of financial and technical risks. Moreover, FiT designs vary widely from country to country and not all feed-in tariff policies have been structured to achieve rapid market growth.

Although not a panacea, FiTs in developing countries can serve as channels for capital and knowledge transfer from the developed to the developing world, and as platforms upon which to build programs to address a range of renewable energy barriers. In recognition of this, several international organizations and NGOs have proposed global funds to support feed-in tariffs in developing countries during the last two years [4-8].

Following the Copenhagen Climate Conference, Deutsche Bank Climate Change Advisors (DBCCA) developed its own concept for a global feed-in tariff program in response to a request from the United

Nations Secretary Generals' Advisory Group on Energy and Climate Change (AGECC): the Global Energy Transfer Feed-in Tariff (GET FiT). GET FiT builds on previous global FiT concepts by incorporating a bottom-up, private sector perspective on renewable energy financial and development risks, by exploring the barriers to program implementation in detail, and by highlighting the instruments which would help to mobilize private capital. The GET FiT concept is intended as a template which could be flexibly adapted to specific national contexts, and could be launched on a bilateral, regional, or global basis.

GET FiT seeks to support both renewable energy scale-up and energy access by combining a) a fund of public money for renewable energy incentives, b) risk mitigation strategies and c) coordinated technical assistance to address project development and financing barriers [2]. The goal of this combined approach is to catalyze the supply of, and the demand for, private sector financing of renewable energy projects by providing private investors with policy “Transparency, Longevity and Certainty” (TLC) [1]. GET FiT would also seek to serve as a bridge to grid parity for renewable energy both by allowing developing countries to gain experience with renewable resources prior to break-even scenarios, and by adjusting incentive rates to reflect lower prices over time.

At its core, GET FiT would provide financial support for policy structures that appropriately adapt feed-in tariff best practices to national contexts, including:

- a) The deployment of advanced feed-in tariff designs that target on-grid, commercialized, renewable resources;
- b) Power purchase agreements as a pre-FiT regulatory mechanism in countries that face grid integration constraints, or for technologies that have a limited in-country track record, with the ultimate goal of the implementation of broader FiTs; and
- c) The adaptation of FiT design principles to create performance-based incentives for decentralized multi-user energy generation, especially mini-grids, in rural areas.

In each of the three cases, the GET FiT Program would contribute public sector funds to share the above-market costs of renewable electricity with partner countries, while utilities would commit to purchasing electricity from generators at market price. This stabilization of revenue streams could attract significant amounts of private sector capital from both domestic and international sources to build renewable energy projects. In addition to providing direct financial incentives, the GET FiT concept identifies a series of guarantees and mitigation strategies to address financial risks beyond those that derive from policy structure. GET FiT, for example, envisions that governments would guarantee the utility payments to generators, but that the GET FiT fund could supply a backstop guarantee as well in countries where credit or sovereign risk are high (see Section 3.4). GET FiT could also be used as a platform to coordinate and deliver targeted technical assistance.

This paper conducts utilizes a case study of Tanzania in order to further explore the practical considerations that would be involved with moving GET FiT, or any of the other proposed global feed-in tariff funds, from concept to implementation.

2. Methodology

The analysis in this paper was undertaken in several stages. First, an initial proposal for the structure of the GET FiT program was developed and benchmarked against other existing and proposed international funds. Second, a rigorous outreach and peer review process was launched during which over 150 international experts in the fields of renewable energy, finance, and international development were consulted. Following revisions, the final GET FiT policy template, which was presented to the AGECC in April, 2010, was published online [9]. Third, DBCCA and its network of partner organizations began to conduct a global scan of developing countries with existing feed-in tariffs in order to identify possible case studies for a) evaluating the structure of the feed-in tariff from an investor perspective using the DBCCA TLC analysis methodology [1] and b) exploring the potential to apply the GET FiT template in the event that international sponsorship could be

identified. Tanzania was selected for a case study following consultations with experts familiar with the country's recently enacted feed-in tariff design.

3. Results

3.1 Overview of Tanzania's FiT

During the last few years, Tanzania has faced serious power generation crises (2006, 2008, and 2009) caused by periods of drought combined with unplanned generator outages. The most recent crisis occurred from October to November 2009 when Tanzania experienced up to 14 hours of load shedding per day in certain parts of the country. Several urban centers routinely rely on isolated diesel stations which provide low quality, high cost service and are a financial drain to the national electric utility, TANESCO because of a uniform national tariff policy. The national electrification rate is 14% and only 2% of the population has access to electricity in rural areas. The inadequate provision of electricity has been recognized as one of the infrastructure bottlenecks to economic growth.

To help meet Tanzania's need for power, improve electricity access, and foster domestic private sector investment in small clean power sources, the Tanzanian Energy and Water Utilities Regulatory Authority (EWURA) developed the Small Power Producer (SPP) program, approved by the Government of Tanzania in fall of 2009. The SPP regulations enable expansion of renewable and cogenerated electricity through standardized power purchase agreements (PPAs), standardized feed-in tariff payments, and streamlined interconnection and licensing requirements. The regulations provide the legal basis for customers to interconnect renewable energy generators into both the national grid or into isolated mini-grids, and to export excess power (up to 10 MW) to the national utility [11,12]. In some cases, SPPs will complement existing diesel generation of TANESCO mini-grids. In other cases, the SPP policy will bring electricity to communities without electricity and sell directly to new customers.

Tanzania SPP is still early in its process: the standardized PPA and tariffs were approved in 2009. The rules for the program are still under consideration by EWURA. To date, TANESCO has signed five PPAs with SPPs totalling 24.4 MW and is in communication with four additional project developers that have expressed interest in PPAs for additional 27.5 MW.

Financing is proving to be a key problem for SPP project developers in Tanzania. Promising projects are unable to find attractive financing because Tanzanian banks are not familiar with renewable energy and view renewable energy projects categorically as risky. Commercial loans in Tanzania are generally high interest (fixed rate loans are rare and charge at least 16%) with short tenors (generally maximum six years). Project finance (based upon the projected cash flows of the project rather than the balance sheets of the project sponsors) is unheard of. Loans have high equity co-finance requirements and require recourse to the developer's balance sheet. These financial hurdles make it difficult for most SPP projects to move forward. A recently approved World Bank credit line is expected to address one of the constraints – extending the maturity of loans to 15 years, but other constraints, such as high equity requirements remain.

3.2 TLC analysis of Tanzania Feed-in Tariff

Investors look for three key policy elements: Transparency, Longevity and Certainty when making investment decisions [1]. The core elements of feed-in tariff policies that support TLC are: 1. Tariff pricing differentiated by technology. 2. A standard offer guaranteeing payment for renewable energy. 4. Guaranteed interconnection. 5. Long-term, performance-based payments that reflect generation costs. Advanced FiTs are further defined as identifying a pathway to grid parity, subject to a transparent and iterative price discovery process. Taking these core elements in account, DBCCA has created a benchmarking tool for analyzing whether or not feed-in tariff designs support TLC. Tanzania's SPP was analyzed using the Deutsche Bank TLC criteria, with the results presented in Table 1 below. The "TLC at the Right Price" column contains the ideal design choice from the

investor perspective as defined in [1, 2], whereas the far right column contains the design present in Tanzania.

Table 1 – Analysis of Tanzania Feed-in Tariff and TLC Criteria

<i>FiT Design Category</i>	<i>FiT Design Issue</i>	<i>TLC at the Right Price</i>	<i>Tanzania</i>
Policy	"Linkage" to mandates & targets	Yes	No
Framework	Eligible technologies	--	All renewables and cogeneration
Core Elements	Specified tariff by technology	Yes	No
	Standard offer/ guaranteed payment	Yes	Yes
	Interconnection	Yes	Yes
	Payment term - all Biomass only	15-25yrs 5-10 yrs	15 Year PPA. Tariffs change annually but with floor and CPI-adjusted ceiling
Supply & Demand	Must take	Yes	Yes
	Who operates	Private entities	Private entities
How to Set Price	Fixed vs. variable price	Peg to inflation for generators with high O&M*	Fixed (avoided cost)
	Generation cost vs. avoided cost	Generation	Avoided cost
	IRR target	Yes	No
	Degression	Yes	No
How to Adjust Price	Periodic review	Yes	Yearly
	Grid parity target	Yes	Currently at grid parity (avoided cost)
Caps	Project size cap	Depends on context	No capacity cap, but 10 MW export cap
	Volume Cap	Based on ratepayer impact or transmission constraints	No
Policy Interactions	Eligible for other incentives	Yes – eligible to take choice	Yes
Electricity Market Structure	IPPs eligible	Yes	Yes
Transparency	Developers/owners able to navigate the process	Yes	Yes
Social Adder	Bonus paid for local content or ownership	---	No
Eligible for CDM	Projects can take carbon offsets in addition to FiT	Yes	Yes
Streamlining	Transaction costs minimized	Yes	Yes

3.3 Tanzania through the TLC lens

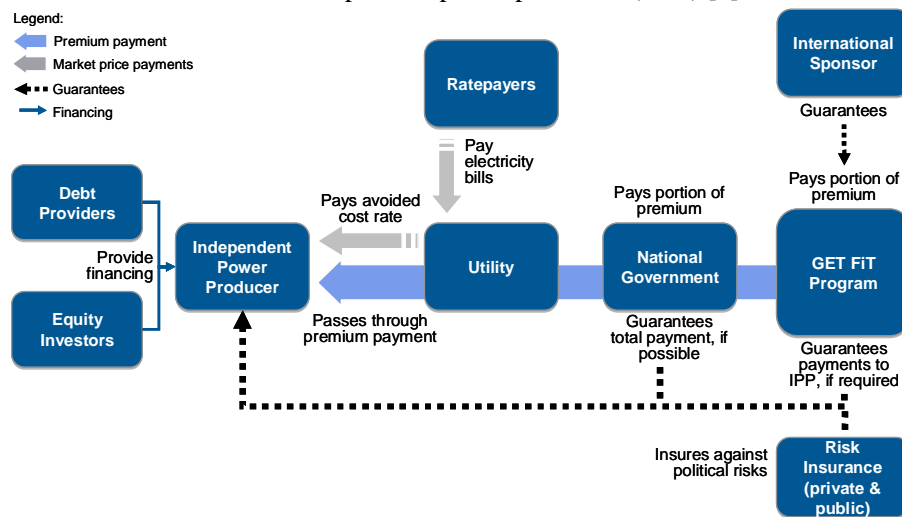
Based on TLC analysis, Tanzania's FiT meets many, but not all, of the policy best-practices. From the TLC perspective, one shortcoming of the Tanzania FiT is that the tariff structure is based on avoided utility costs rather than on technology-specific costs plus profit. A successful FiT depends on a tariff necessary to attract investors via a reasonable internal rate of return. For 2010, the Tanzanian FiT is 110.3 Tanzanian Shillings (about US\$0.077) per kWh – enough to attract "low hanging fruit" projects such as biomass at sugar mills and small hydropower, but insufficient to encourage support wind, solar, or other renewable energy technologies.

Tanzanian regulators have expressed interest in a technology-based FiT, but thus far it has been unclear how the incremental costs of the premium payment (i.e. payments above avoided utility costs) would be paid. Like most of the utilities in sub-Saharan Africa, TANESCO does not have fully cost-reflective electricity rates [13]. It is therefore unlikely that the incremental costs could be passed on to consumers. The GET FiT concept would provide a template to address this issue by institutionalizing the transfer of payments for FiT premiums from sponsors to developing countries and enabling rates to be based on generation cost rather than avoided cost. A noteworthy and innovative aspect of the Tanzanian SPP framework is that it covers both types of SPPs – those selling power to the grid and those selling to rural customers directly through mini-grids. This fits well with the GET FiT objectives of renewable energy and access expansion.

3.4 GET FiT support for the Tanzania FiT

If the GET FiT program were to be implemented in Tanzania, its primary goal would be to mitigate project development and financial risks. As can be seen in Figure 1 below, IPPs would receive a payment at the avoided cost rate from the utility, which recover its costs through standard channels. The GET FiT program would pass a direct incentive, equal to the premium required by generators above avoided cost, through the national government and utility to the IPP. By providing generators with generation cost-based payments under a standard offer, GET FiT would mitigate significant revenue and market risks and enable lower financing costs. Counterparty risk could be mitigated through several avenues, including having the government guarantee the feed-in tariff payments and having sovereign risk insurance entities (e.g. MIGA, OPIC, private sector providers, etc.) back the government’s guarantee. Since Tanzania participates in the HIPC Initiative, however, the national government may not be in a position to guarantee the utility payments. As a backstop, GET FiT could use its funds to guarantee the full payment if supported by a creditworthy sponsor, such as a coalition of national governments or a multi-lateral institution. These risk mitigation efforts could enable a broader portfolio of Tanzanian projects to access private capital.

Figure 1 – GET FiT would provide premium payments passed through national governments and utilities to independent power producers (IPPs) [2]



Risk mitigation in itself may not be sufficient to support the success of the Tanzania’s SPP. In order to ensure the sustainability and longer-term success of Tanzania’s renewable energy market, it is important that Tanzanian financiers be included in SPP deals. This could be achieved through targeted technical assistance to lenders in order to increase their comfort level with SPP systems, and through financing structured to allow Tanzanian lenders a “seat at the table” while limiting their exposure to project risks. Technical assistance could also be provided to support ongoing feed-in tariff policy design, price discovery, rate setting, and policy review and adjustment. Technical assistance might

also be provided to support the engineering, design, and financing of SPPs in mini-grids. The use of feed-in tariffs to support mini-grid development is a relatively new innovation which has the potential to reshape international approaches to energy access expansion – but only a few countries are pursuing mini-grid feed-in tariffs and the concept does not have an established track record. GET FiT could coordinate these and other technical assistance efforts in order to improve policy and process efficiencies, provide best-practice benchmarks, and facilitate project financing, thereby enabling more rapid scale of renewable energy deployment.

4. Conclusions and Discussion

Tanzania's new feed-in tariff under the SPP program is a promising vehicle for supporting renewable energy development and expanding energy access in a country that faces significant capacity shortfalls and electrification challenges. Implementing a program based on the GET FiT template could allow Tanzania to broaden its portfolio of low-carbon generation, provide necessary credit support to enable financing, and attract new sources of both national and international capital. Key questions remain about how a GET FiT would be structured and financed. The GET FiT concept is intended to be a flexible template that could be managed and funded through a number of different channels. At this stage of concept development, neither capitalization strategies nor governance structure are addressed in detail. A key next step for Tanzania would be to conduct a more detailed assessment of the financial and regulatory barriers to fully realizing the SPP program's goals, and identify whether international assistance as envisioned under GET FiT would be appropriate. A strategic roadmap for engaging international partner governments or organizations could then be developed and explored. There are currently several ongoing or proposed bilateral partnerships focusing on renewable energy development in developing countries that have feed-in tariff policies, and these could serve as models. Another key challenge will be how best to secure the funds necessary to guarantee long-term incentive payments to projects. It is unlikely that national donors would be able to provide the upfront the capital necessary for the entire projected incentive payment. As a result, it may be necessary for GET FiT to explore funding opportunities in bond markets secured by long-term annual commitments from donor organizations and/or other revenue streams.

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