

From Policy to Practice: The Implementation of the Renewable Energy Act 2011 in Ghana

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Presented by:
Samuel Sarpong – Executive Secretary, PURC

Outline of Presentation

- Over of PURC and RE Mandate
- Development of RE FIT Methodology & Guidelines
- Specific Conditions for selected RE Technologies
- Gazetting of RE FIT and Implementation Requirements

Public Utilities Regulatory Commission Act, 1997 (ACT 538)

- An ACT to provide for the establishment of a Public Utilities Regulatory Commission to regulate and oversee the provision of utility services by public utilities to consumers and to provide for related matters.

Section 4 - Independence of the Commission

- ***Subject to the provisions of this Act, the Commission shall not be subject to the direction or control of any person or authority in the performance of its functions.***

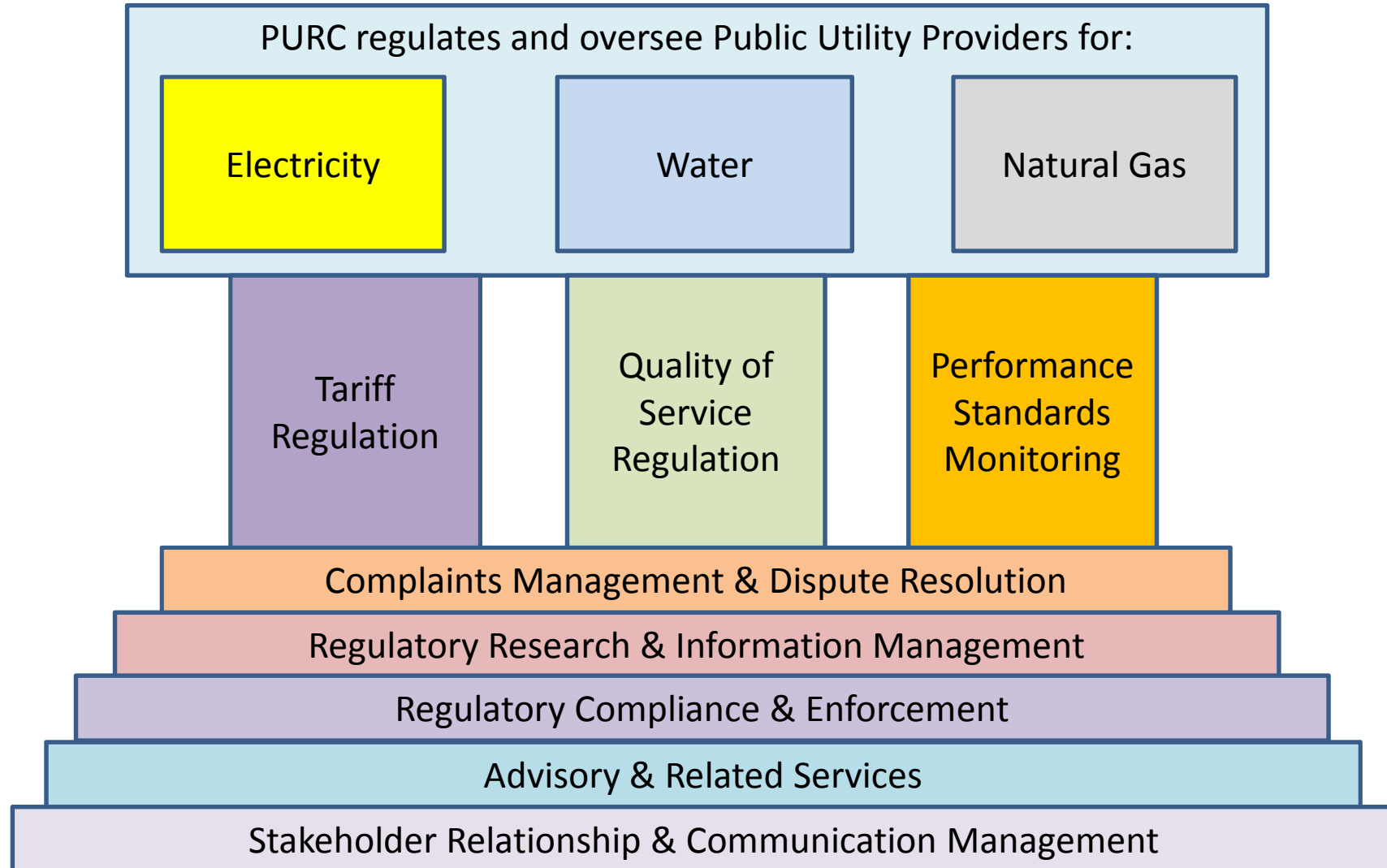
Public Utilities Regulatory Commission Act, 1997 (ACT 538)

Section (3) - Functions of the Commission

- To provide guidelines on rates chargeable for the provision of utility services,
- To examine and approve rates chargeable for the provision of utility services,
- To protect the interest of consumers and providers of utility services
- To monitor standards of performance for the provision of services,
- To initiate and conduct investigations into standards of quality of service given to consumers
- To promote fair competition among public utilities
- To conduct studies relating to economy and efficiency of public utilities
- To make valuation of property of public utilities it considers necessary for the purposes of the Commission,
- To collect and compile data on public utilities it considers necessary for the performance of its functions,
- To advise a person or an authority in respect of a public utility,
- To maintain a register of public utilities, and
- To perform any other functions as are incidental to its other functions.

Public Utilities Regulatory Commission Act, 1997 (ACT 538)

Functions of PURC



PURC FIT Mandate

- The PURC Act, Act 538 of 1997 vests the mandate for economic and quality of service regulation of public electric, water and gas utilities in the PURC.
- Subsequent to Act 538, the Ghana Renewable Energy Act vests the mandate for economic regulation of renewable energy (RE) in the PURC.
- From this mandate, the Law tasks the PURC with the responsibility of setting Feed-in-Tariffs (FiTs) for selected renewable energy technologies.
- The existing Electricity Rate Setting Guidelines were developed mainly based on hydro and thermal sources of electricity generations.
- A FiTs Pricing Methodology has therefore become one key instrument required by the PURC to execute its mandate under the RE Act.

Development RE FIT Methodology & Guidelines

RE FIT Methodology Overview

- PURC with financial assistance from GEDAP, procured the services of Frankfurt School of Finance and Management (FSFM), to develop a FiT Pricing Methodology for the Commission.
- The Pricing Methodology developed by the consultant was to be applied to estimate maximum guaranteed FiTs for electricity generated from five renewable energy technologies (RETs) selected from the RE Act, for a fixed term that provides a stable revenue stream and adequate return on investment for RE investors.
- A final report on this study was submitted to the Commission in the last quarter of 2011.
- Following this, personnel from PURC, EC and MoEn were in February 2012 trained by the consultant in Kenya, on the use of policy and economic parameters as well as spreadsheet tools to calculate FiTs.

RE FIT Methodology Overview

- During the training, some policy gaps were identified. At a presentation on the August 16, 2012 the policy gaps were discussed amongst PURC, EC MoEn and GEDAP.
- During the training in Kenya the Ghana team realized the need for setting up a renewable energy FiTs Implementation Committee, made up of personnel from the key stakeholder organizations, i.e., the PURC, MoEn and EC.
- At the August 16, 2012 meeting under reference above, the proposal for setting up a FiTs Implementation Committee was agreed upon.

FiTs Implementation Committee Objectives

- To advise the PURC and other key stakeholder institutions on policy, socio-economic, technological and environmental concerns of the uptake of RETs, and carry out the various processes leading to a speedy and efficient implementation of the FiTs for candidate RETs.

FiTs Implementation Committee

Scope of Work

- Identify any policy gaps which might hinder the smooth implementation of the FiT, and make appropriate recommendations.
- Draw up a time frame for the various stages, processes and implementation of the FiTs, and a budget to cover activities of the Committee.
- Make recommendations to PURC and other key stakeholders on findings from the stakeholder consultations (to be organized by PURC), to incorporate genuine concerns of interest groups, where necessary.
- Design FiTs implementation training needs.

Composition of Committee Members

- Mr. Samuel Kwadwo Sarpong, Executive Secretary / Commissioner (PURC) - Chairman
- Dr. S. Akorli, Director RERD (PURC) - Member
- Mr. Oscar Amonoo - Neizer, Director, ED (PURC) - Member
- Dr. Nii Darku-Asante, Director Technical Regulation (EC) - Member
- Mr. Kwabena Otu-Danquah, Head Renewable Energy Unit, (EC) - Member
- Mr. Wisdom Ahiataku-Togobo, Director, Renewable Energy (MoEn) - Member
- Mr. Emmanuel Osafo, Ag. Dir Power (MoEn) – Member
- Mr. Frank Akligo, Director, NEDCO – Member
- Mr. Daniel Azu, Director, ECG – Member
- Mr. Kofi Ellis, Director, VRA - Member
- Eric Obutey, Snr. Manager (PURC) - Secretary

Specific Conditions for selected RE Technologies

Selected Renewable Energy Resources for Development under REFITs

- Wind (on-shore and off-shore)
- Solar (including PV and CSP)
- Biomass (energy crops, forest off-cuts, agricultural residues)
- Waste-to-energy (industrial / municipal solid and liquid waste including Biogas)
- Hydro (runoff river, dams)

Application for the development and generation of electricity for the regulated market using the above resources shall be subjected to a competitive bidding process.

Wind Electricity Generation Resources

- Ghana's wind energy resource is moderate and predominately along the coast.
- From studies conducted by the Energy Commission, the exploitable wind energy potential is about 2,000MW of which about 300MW could be easily developed especially along the east of the Greenwich Meridian to generate over 500GWh of electricity annually.
- The Government is undertaking detailed wind resource assessment in eleven promising locations to provide the broad indicative information about the wind potential for power generation.
- Detailed feasibility studies are required for each site, since wind energy resource potential is site-specific.

Specific Conditions for Wind Resources

- The total capacity allocated to the regulated market shall be limited to 300MW
- The Feed in Tariff shall not exceed 32.1085 GHp / kWh of electrical energy supplied in bulk to the transmission or distribution system at the interconnection point.
- Within the competitive bidding process, each developer shall be limited to bid for a maximum of 50MW capacity within the tariff control period set by PURC.
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- Assumptions underpinning the above tariff and cap computations:
 - Capacity factor 25%-32%
 - Variable energy production
 - No storage facility.

Specific Conditions for Solar Resources

- Solar refers to photovoltaic (PV) or thermal energy resource obtained from the sun.
- The total capacity allocated to the regulated market shall be limited to 100MW
- The Feed in Tariff shall not exceeding 40.2100 GHp / kWh.
- Within the competitive bidding process, each developer shall be limited to bid for a maximum of 20MW capacity within the tariff control period.
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- Assumptions underpinning the above tariff and cap computations:
 - Annual average solar radiation range of 4.5 to 5.5kWh/m²/day
 - Capacity factor 17%-19%
 - Daily energy production period (8 hours maximum)
 - Non availability during peak demand periods (evenings)
 - No storage facility

Specific Conditions for Biomass Resources

- Biomass refers to plant or animal based energy resource and includes energy crops, forest off-cuts, agricultural residues etc.
- There shall be no capacity limitation for Electricity generated from biomass resources.
- Feed-in-Tariff for electricity generated from Biomass shall not exceed 31.4696 GHp / Kwh of electrical energy supplied in bulk to the transmission or distribution system at the interconnection point.
- Assumptions underpinning the above tariff and cap computations are:
 - Energy production is dependent on the availability of the resource.
 - Potential to address environmental and health challenges.
 - Ability to focus generation during peak periods
 - Capacity factor above 40%

Specific Conditions for W2E Resources

- Waste-to-Energy refers to industrial and municipal organic waste based energy resource.
- Even though the potential for power generation from waste could be large, industrial and municipal solid wastes are hardly exploited for energy purposes.
- Currently, most organic industrial and municipal wastes are disposed without treatment and thus have serious health and environmental consequences nationwide.
- Furthermore, municipal solid wastes are not separated at the source of generation before disposal which poses great challenge for waste-to-energy development in Ghana.

Specific Conditions for Hydro Resources

- Hydro refers to hydro energy resource of 100MW and below as defined in the Renewable Energy Act, 2011 (Act 832).
- An assessment of small hydro resource potential indicates that there are suitable sites for small and medium hydro power development in the country.
- It is projected that hydroelectric plants of over 700 MW are possible on over 17 sites on the Black Volta, White Volta, Otis River, Tango River, Pra River and Ankobra Rivers among others.
- However, detailed feasibility studies are required for each site, since hydro energy resource potential is site-specific.

Specific Conditions for Hydro Resources

- There shall be no capacity limitation for Electricity generated from hydro resources.
- The Feed in Tariff for electricity generated from hydro above 10MW capacity shall not exceed 22.7436 GHp / kWh of electrical energy supplied.
- The Feed in Tariff for electricity generated from hydro below 10MW capacity shall not exceed 26.5574 GHP / kWh of electrical energy supplied
- Assumptions underpinning the above tariff computations:
 - Energy production is dependent on the availability of the resource.
 - Potential for creation of multi - purpose jobs (farming, river transport fishing etc).
 - Ability to focus generation during peak periods
 - Capacity factor above 40%

Connection Obligations

- The Feed-in-Tariffs include interconnection costs – transmission, substations and associated equipment - therefore the grid system operator shall connect plants generating electricity from renewable energy sources specified by the PURC / EC.
- Where necessary, the grid system operator shall construct or upgrade its grid at a reasonable economic expense to facilitate interconnection.
- The interconnection costs including transmission and distribution lines and substations construction or upgrading shall be charged to the RE plant operator who shall recover these costs from the Feed-in-Tariff in accordance with the RE Act 832 .

Purchase Obligations

- The grid / distribution system operators shall connect plants generating electricity from renewable energy sources and guarantee priority purchase, transmission and distribution of all electricity from renewable energy sources up to the approved capacity limit for the regulated market.
- The regulated utilities shall pay a tariff agreed upon between them and the power producer subject to the approved maximum tariffs and maximum capacities specified for the regulated market
- The regulated utilities shall recover from electricity consumers the feed-in tariff as published by the PURC from time to time.
- To meet their Renewable Energy Purchase Obligations, all distribution utilities shall procure their requirements through international competitive bidding (ICB) in line with guidelines approved by PURC in consultation with Public Procurement Authority (PPA).

Compliance with Technical, Legal and Regulatory Requirements

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

Gazetting of FIT & Implementation Requirements

Gazetting of RE FIT

- In accordance with the statutory duty to publish feed-in-tariff rates approved by the Public Utilities Regulatory Commission (PURC) under Section 29 of the Renewable Energy Act, 2011 (Act 832) (“the Act”), this publication is made this 28th August 2013.
- In accordance with Section 5(a) of the Act, the rates provided in the Schedule are the feed-in-tariff rates chargeable for the purchase of electricity from renewable energy sources by public utilities to take effect from 1st September 2013.
- In accordance with Section 27(4) of the Act, the approved rates in existence in the year in which a Power Purchase Agreement is signed in respect of a Renewable Energy project shall be fixed and applicable for that project for a period of ten years. Subsequently the rates shall be subject to review every two years.

Gazetting of RE FIT

Renewable Energy Technology	FIT Effective 1st September 2013 (GHp/kWh)
Wind	32.1085
Solar	40.2100
Hydro $\leq 10\text{MW}$	26.5574
Hydro ($10\text{MW} > \leq 100\text{MW}$)	22.7436
Landfill Gas	31.4696
Sewage Gas	31.4696
Biomass	31.4696

***The approved rates are based on Ghana Cedi/ US Dollar Exchange Rate of GH¢ 1.9968 to US\$ 1.0000 being the Average Selling Rate as at 27th August 2013 obtained from the Association of Bankers.**

Implementation Procedure

- It is proposed that the RE-FIT implementation Committee continue to operate and oversee implementation of the RE-FIT during the initial control period in order to address cross-cutting issues during the transition period until such a time that the Renewable Energy Authority is operationalised.

Implementation Procedure

- The RE-FIT implementation committee shall undertake the following activities during the transition period:
 - Draft Renewable Purchase Obligation (RPO) and Renewable Energy Certificates
 - Development of Communication Strategy for stakeholder sensitisation
 - Conduct Stakeholder consultation and education
 - Conduct training programme and capacity to key stakeholders
 - Develop interconnection agreements and renewable energy PPA
 - Conduct preliminary analysis for exploitation of other renewable energy resources covered under the scope of this assignment.
 - Conduct periodic impact assessment to deepen the REFIT implementation
 - Draft Carbon Credits Policy for implementation
 - Review and finalise implementation of Net Metering Policy
 - Review and finalise Renewable Energy Fund Document for Implementation

Thank you for your attention

