

GHANA RENEWABLE ENERGY FAIR 2015



TARIFF SETTING FOR RENEWABLES: BALANCING THE NEEDS OF DEVELOPERS, CONSUMERS AND ENVIRONMENT

International Conference Centre,
Accra, Ghana
November 3 to 5, 2015,



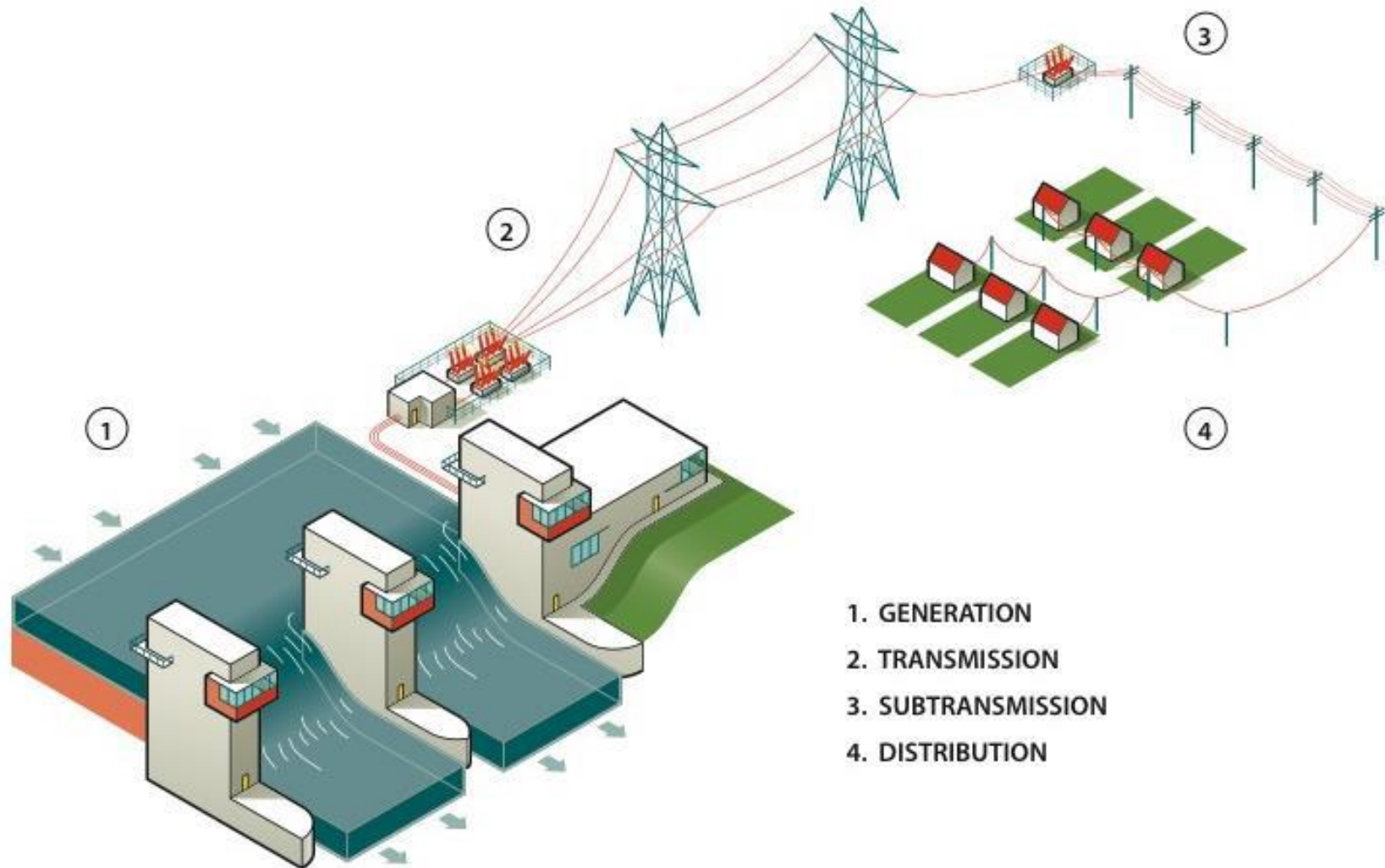
**Samuel Sarpong, Executive Secretary
Public Utilities Regulatory Commission**

PRESENTATION OUTLINE

- Overview of Ghana's Power Sector
- Overview of PURC's Mandate
- Overview of Tariff Regulation Activities
- Overview of PURC's Tariff Methodology
- Overview of PURC's REFIT Mandate

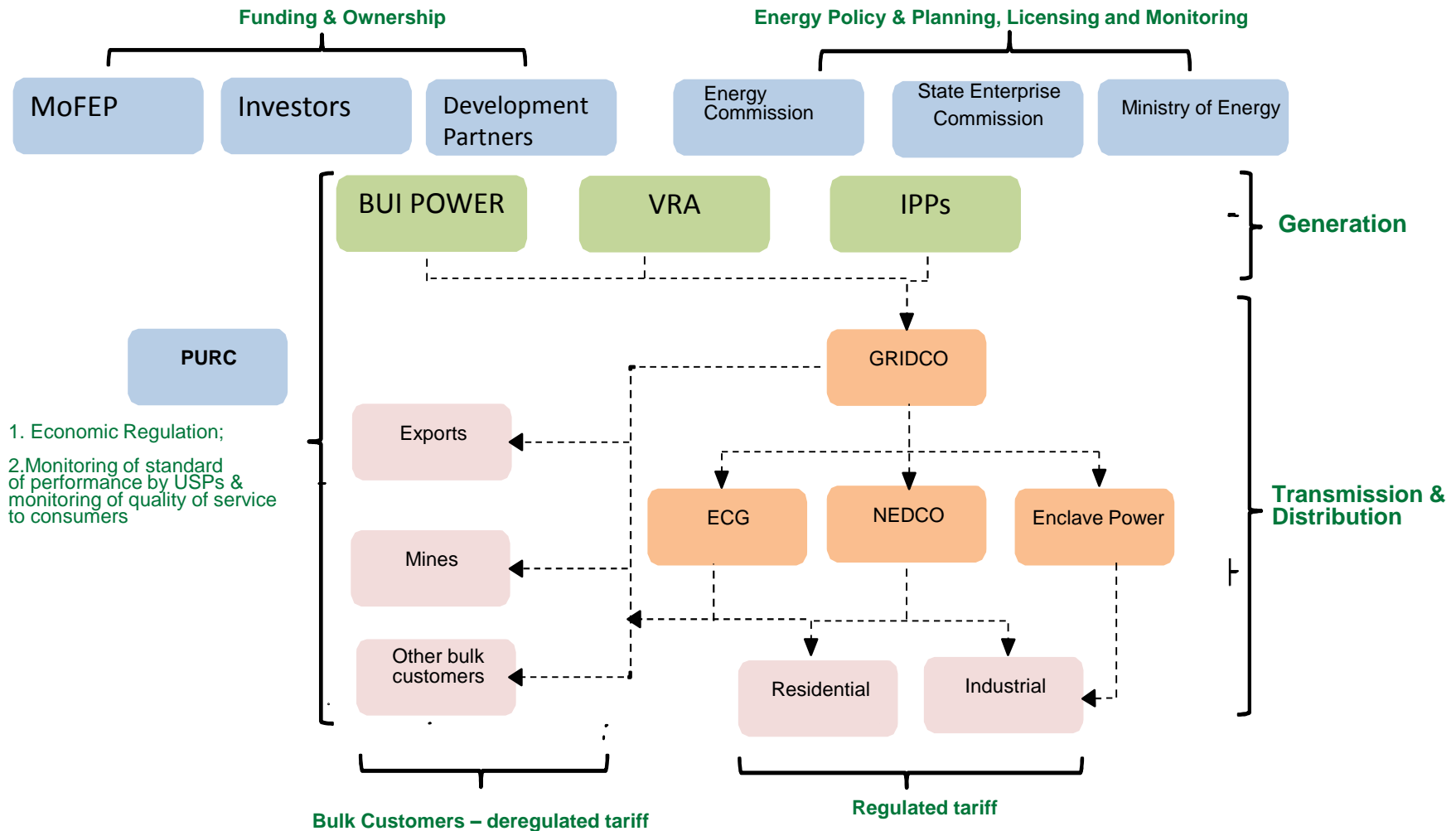
OVERVIEW OF GHANA'S POWER SECTOR

How Power moves through the electricity system



1. GENERATION
2. TRANSMISSION
3. SUBTRANSMISSION
4. DISTRIBUTION

Overview of Ghana's Power Sector



*IPPs - Sunon Asogli, Cenit Power, TAPCO.

OVERVIEW OF PURC REGULATORY ACTIVITIES

PURC Mandate (1/3)

- Public Utilities Regulatory Commission Act, 1997 (Act 538) provide for the establishment of a Public Utilities Regulatory Commission (PURC) **“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.**

PURC Mandate (2/3)

- “Public utility” means any person engaged in the provision for a fee, whether directly or indirectly, of any of the following services to the public –
 - the supply, transmission or distribution of electricity;
 - the supply, transmission or distribution of water;
 - other public utility services excluding a service involving or related to a petroleum product, that the Commission shall by legislative instrument prescribe on recommendation of the Minister with responsibility for the service”;

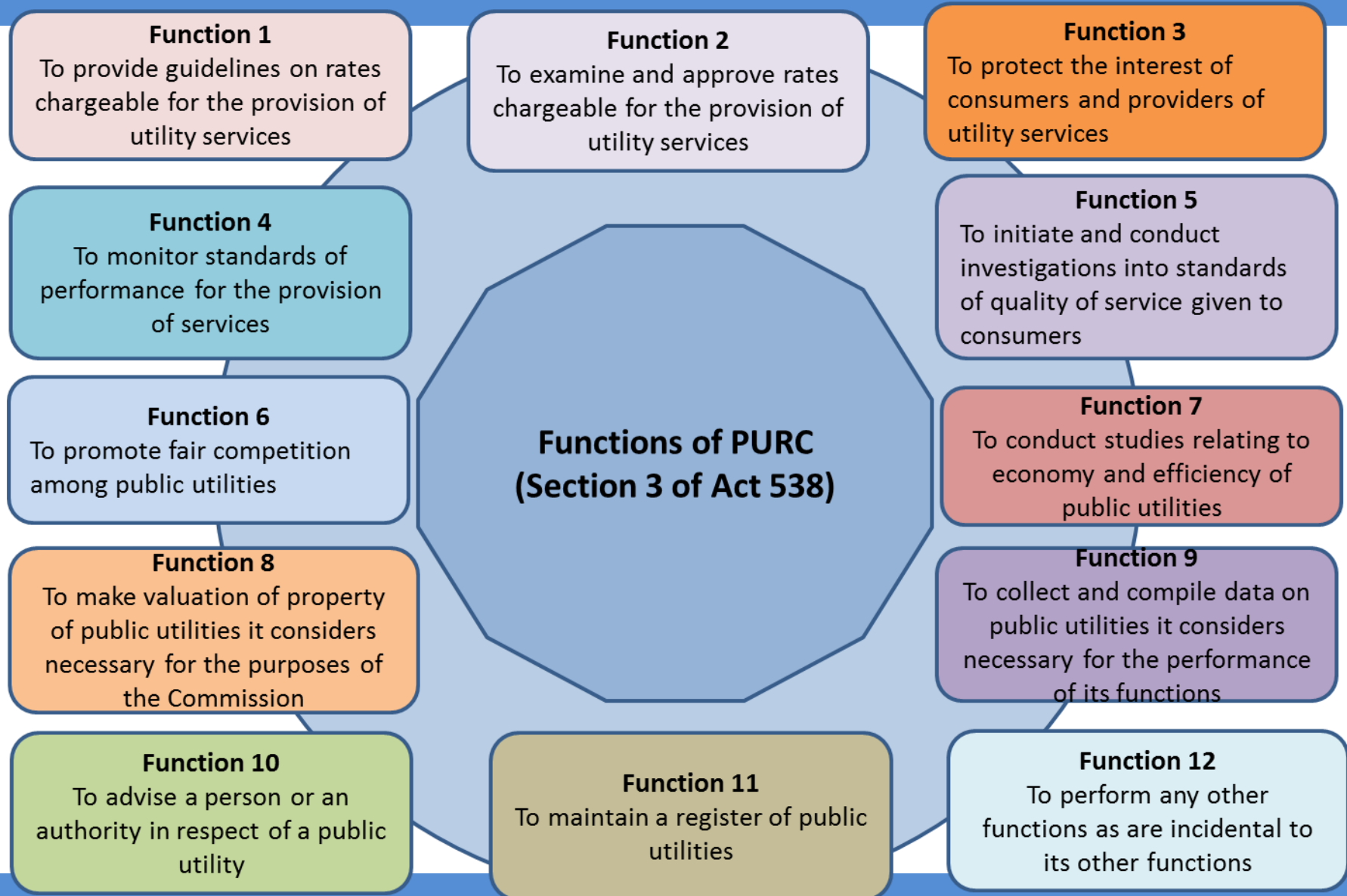
PURC Mandate (3/3)

(Natural Gas Regulation)

- Energy Commission Act 1997, (Act 541):
 - Section 24(1b) provide that the tariffs to be charged by the licensed Gas Transmission Utility authorised to operate, for its services, are subject to the approval of the PURC.
 - Section 25(5) provide that the rates to be charged by the licensed public utility to operate facilities and installations for the wholesale supply of natural gas to distribution companies and bulk customers are subject to the approval of the PURC.
 - Section 26(2) provide that the rates to be charged by the licensed public utility to distribute and sell natural gas without discrimination in the designated areas or zones are subject to the approval of the PURC.

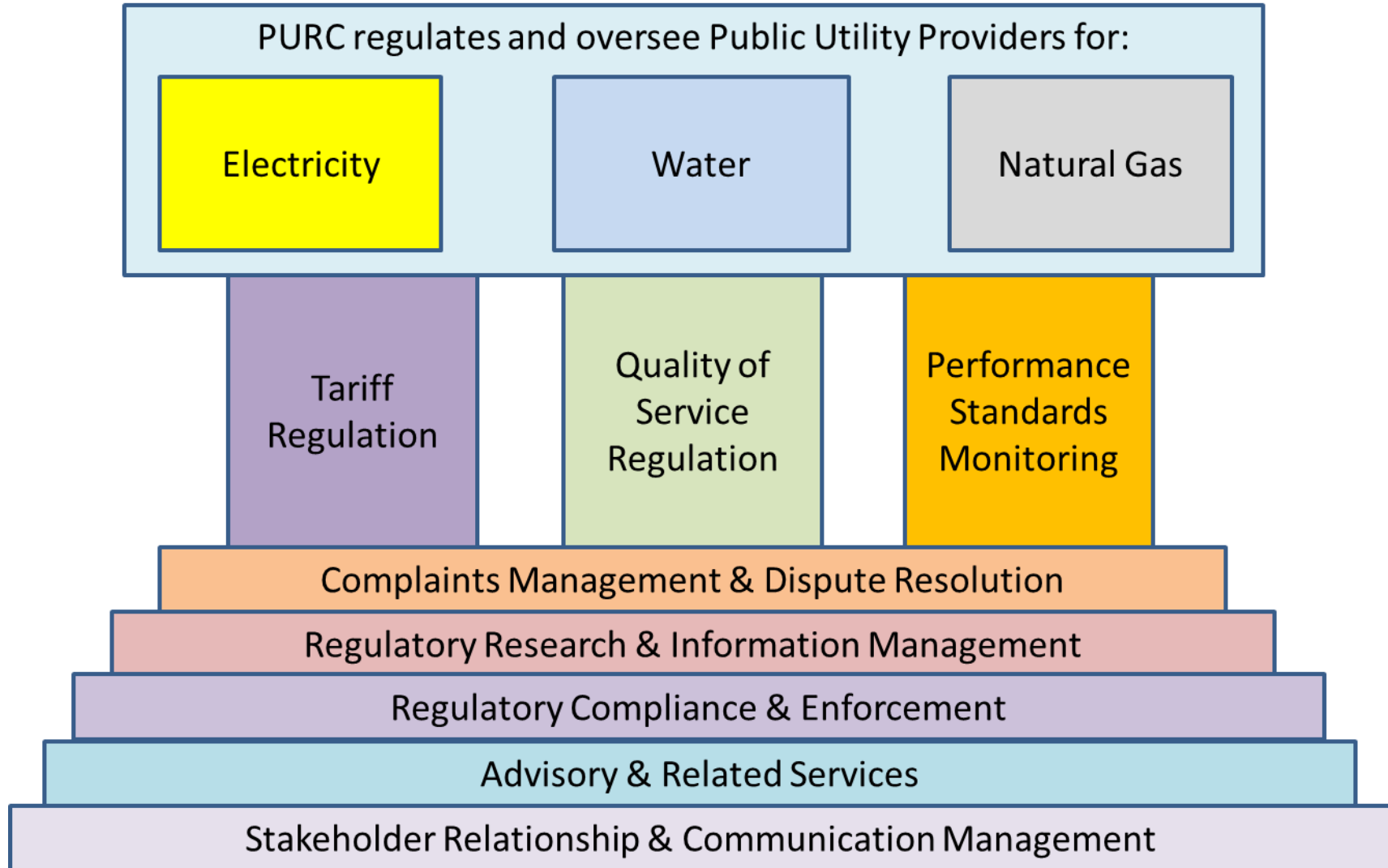
Public Utilities Regulatory Commission Act, 1997 (ACT 538)

Section (3) - Functions of the Commission



Public Utilities Regulatory Commission Act, 1997 (ACT 538)

Section (3) - Functions of the Commission



OVERVIEW OF PURC'S TARIFF METHODOLOGY - ELECTRICITY

Assumptions and Parameters for Electricity Tariff Calculation

Inputs to the tariff – forecasts of load, capacity, fuel costs, investment, levels of losses, customer numbers, O & M costs and other economic and technical data.

Generation:

Life cycle cost (RoRAB),
GenMix, FuelMix, O&M,
Depreciation & RoRC

Transmission:

RoRAB, O&M,
Depreciation & RoRC

Distribution:

RoRAB, O&M,
Depreciation & RoRC

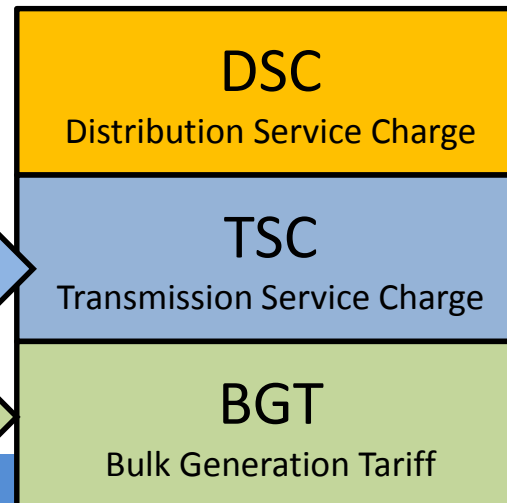
VRA
Heritage Asset
Existing IPPs –
PPAs
New IPPs –
CONE (GT/CC)

GRIDCO
TSO / ISO / MO
Transmission Wheeling
Charges
System Dispatch
Market Operations

ECG
NEDCO
Distribution Wheeling
Charges
Asset Maintenance
Retail of Power

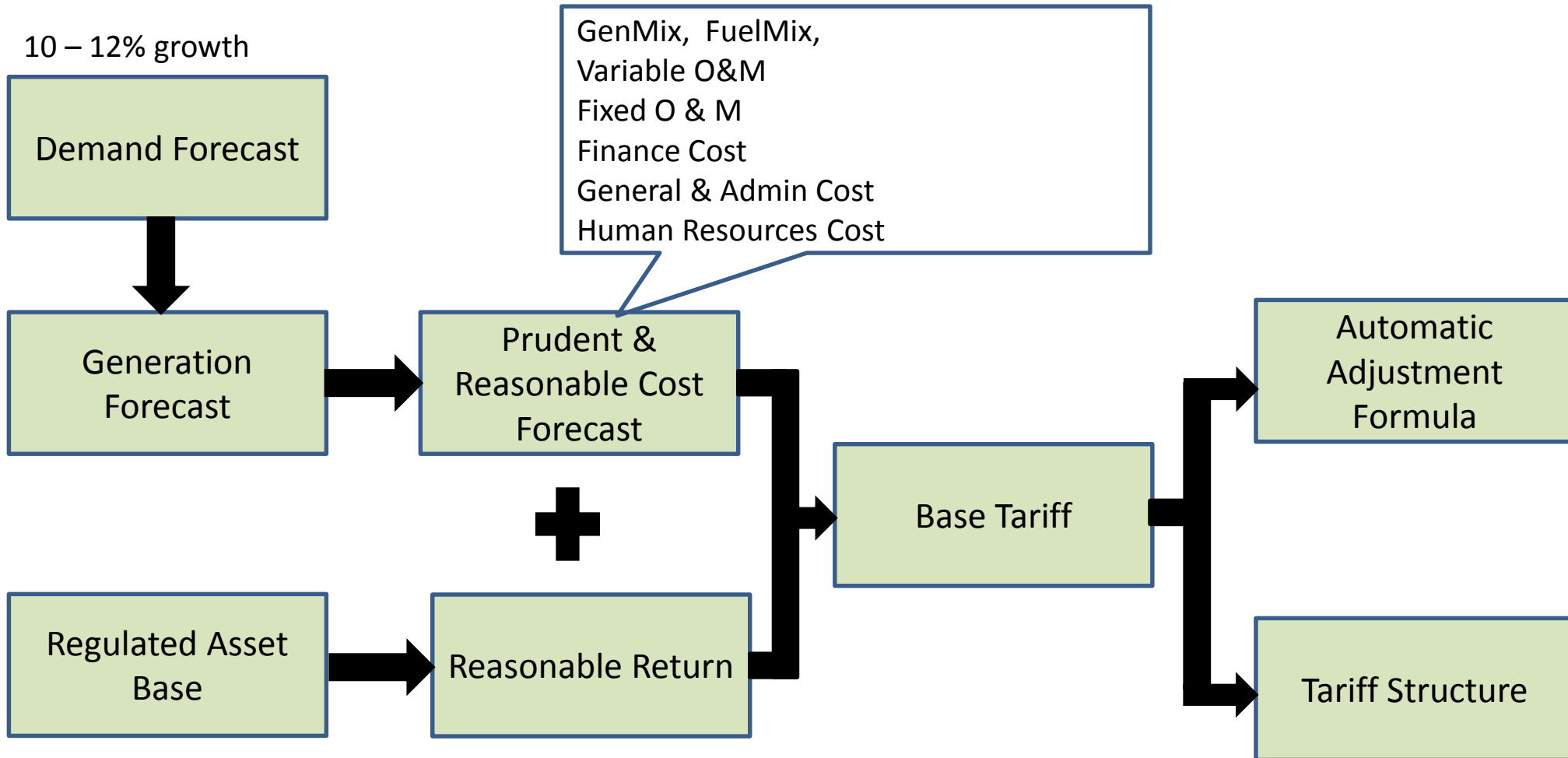
Pricing elements:

1. Capacity
2. Energy
3. Ancillary Services

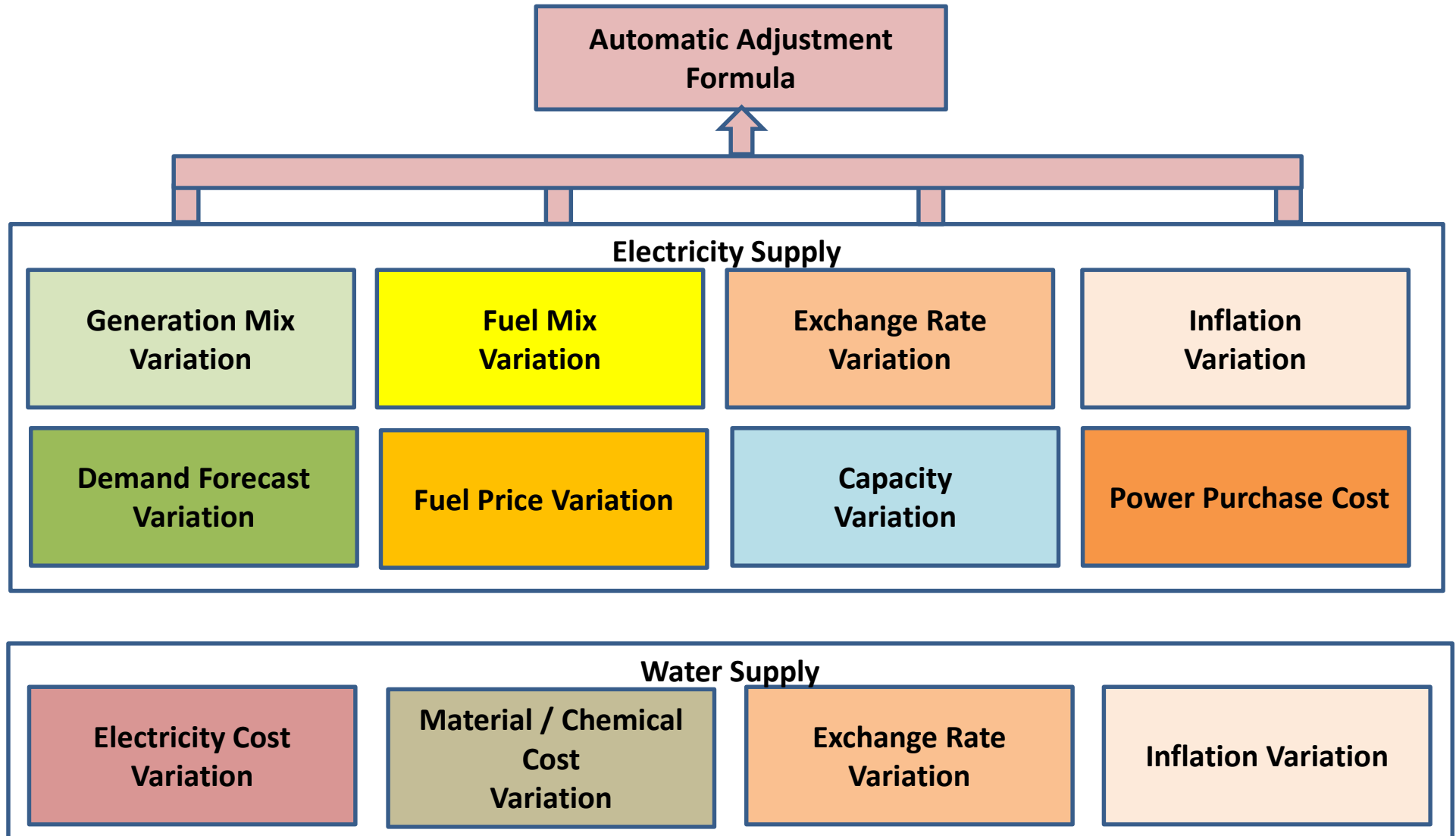


**Final End User
Tariff**

Electricity Generation Tariff Methodology



Automatic Adjustment Formula



OVERVIEW OF PURC'S REFIT MANDATE

PURC REFIT MANDATE

- Subsequent to Act 538, the Ghana Renewable Energy Act, 2011 (Act 832) 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.
- 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”), the RE FIT was last published on November 12, 2014 but took effect from 1st October 2014.

PURC REFIT MANDATE

- 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.
- The approved FIT by the Commission assume recovery of debt and cost of debt (financing cost) of renewable energy developers within the first ten years of the Commercial Operation Date.
- Following the guaranteed period of 10 years, a Renewable Energy developer and its Off – Taker shall undertake a biennial review of the FITY.
- Any revision shall be submitted to the Commission for approval with the aim of balancing the interest of the consumer and the investor as per Section 27 (3) of the Renewable Energy Act.
- No escalation factors shall be allowed outside the parameters of the approved FIT since indexation factors have been considered in fixing the feed – in – Tariff Rate.

FIT Ghana Gazette – Nov 2014

Effective October 1, 2014

Electricity Generated from Renewable Energy Technology	FIT Ghp / Kwh	FIT US\$ / Kwh	Maximum Capacity (MW)
Wind with Grid Stability Systems	55.7369	17.4254	300 MW
Wind without Grid Stability Systems	51.4334	16.0800	
Solar PV with Grid Stability / Storage Systems	64.4109	20.1372	150 MW
Solar PV without Grid Stability / Storage Systems	58.3629	18.2464	
Hydro <= 10 MW	53.6223	16.7643	No limit
Hydro (>10 MW and <=100 MW)	53.8884	16.8475	
Biomass	56.0075	17.5100	
Biomass (Enhanced Technology)	59.0350	18.4565	
Biomass (Plantation as Feed Stock)	63.2891	19.7865	

US\$ Rate = 3.1986 @ September 30, 2014 (GAB)

Renewable Energy FIT Scheme

Case of Algeria

- The first 5 years a fixed rate is guaranteed, based on an estimated production (number of production hours).
- During those years the generator needs to notify the regulator the real production hours.
- At the end of 4th year the Regulator re-calculates the FIT for the following 15 years, based on real plant's hours of production.
- Adjustment can only be +15% to -15% on the number of hours of first period.
- The main benefit is that investors can calculate the FIT they will receive during 20 years based on their estimated production and, of course, that tariff is adapted to real production of each specific site.

Alternative 20 years guaranteed FIT (using Equivalent Annual Annuity)

Electricity Generated from Renewable Energy Technology	FIT US\$ / Kwh (10 years Guaranteed)	FIT US\$ / Kwh (20 years Guaranteed)	Maximum Capacity (MW)
Wind with Grid Stability Systems	17.4254	15.0079	300 MW
Wind without Grid Stability Systems	16.0800	13.8491	
Solar PV with Grid Stability / Storage Systems	20.1372	17.3435	150 MW
Solar PV without Grid Stability / Storage Systems	18.2464	15.7150	
Hydro <= 10 MW	16.7643	14.4385	No limit
Hydro (>10 MW and <=100 MW)	16.8475	14.5101	
Biomass	17.5100	15.0807	
Biomass (Enhanced Technology)	18.4565	15.8959	
Biomass (Plantation as Feed Stock)	19.7865	17.0414	

Conversion factor: 0.861264

Equivalent Annual Annuity Calculation

COMBINED EAC	OPTION 1		OPTION 2	
Equivalent Annual Cost (EAC)	55.74		44.69	
Rate	15%		15%	
Duration	10		20	
MULTIPLYING FACTOR	5.01877		6.25933	

INDIVIDUAL EAC	OPTION 1		OPTION 2	
DEBT	OPTION 1		OPTION 2	
Equivalent Annual Cost	39.02		31.28	
Rate	15%		15%	
Duration	10		20	
MULTIPLYING FACTOR	5.01877		6.25933	
INDIVIDUAL EAC	OPTION 1		OPTION 2	
EQUITY	OPTION 1		OPTION 2	
Equivalent Annual Cost	16.72		16.72	
Rate	15%		15%	
Duration	20		20	
MULTIPLYING FACTOR	6.25933		6.25933	
COMBINED EAC	55.74		48.00	

86.1264%



Thank you for your attention

