TARIFF THEORY AND PRACTICE IN THE ETHIOPIAN ENVIRONMENT

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Outline

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2. Rationale for Cost of Service Method
3. Revenue Requirement
4. Cost Elements
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1. Electricity Tariff Background

- Electricity tariff increase in Ethiopia can be characterized as both infrequent and dramatic. From 1952 until 1994, there had been only four revisions (in 1964, 1971, 1978, and 1986) although the percentage increase had been as high as 54 percent.

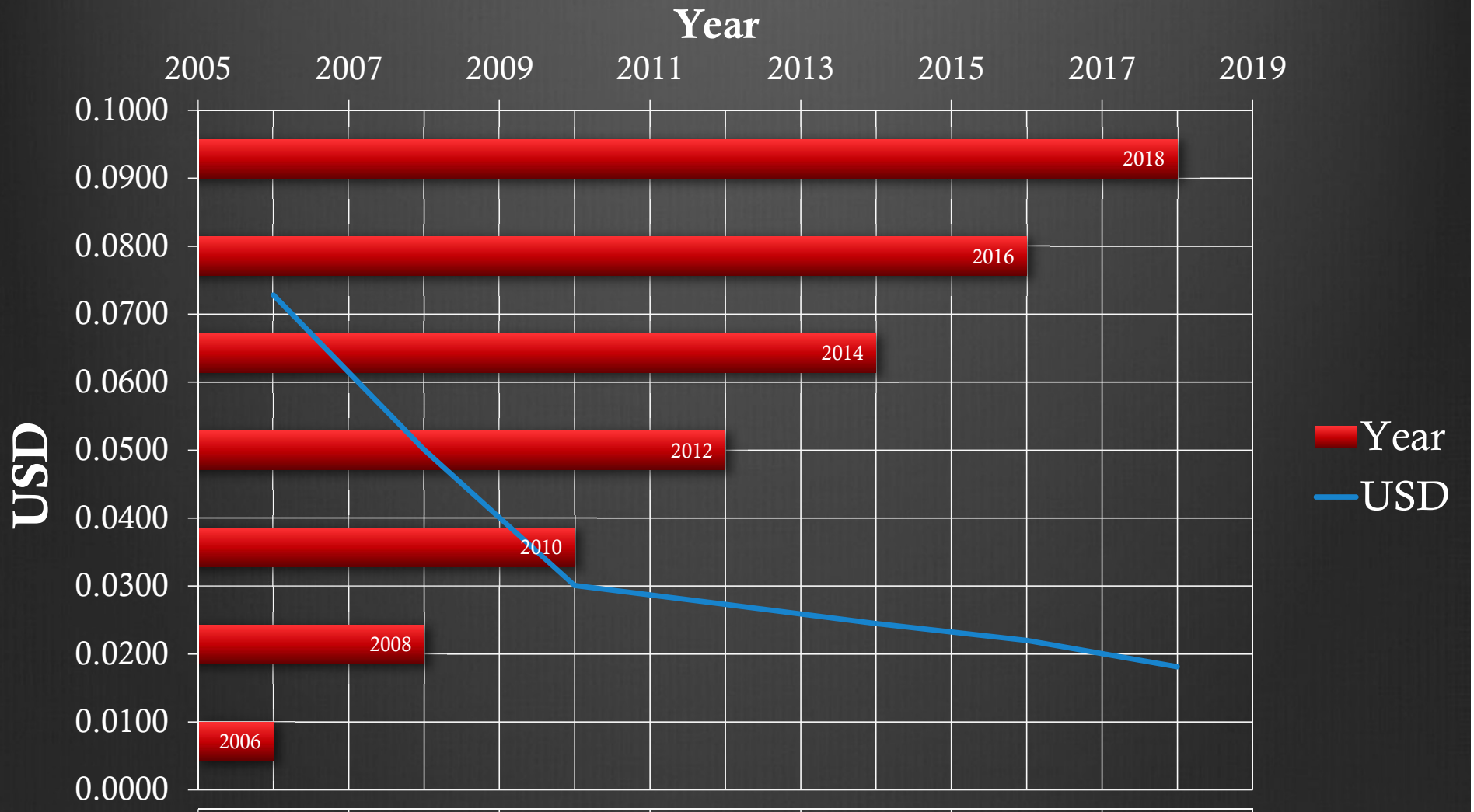
1. Electricity Tariff Background…

- In 1994, a five-year package of tariff adjustment, which intended to increase the average tariff of electricity to USD 0.06 per kWh has been made. As intended, the final tariff adjustment was made in 1998 and the average tariff of electricity was set at US $ 0.06 per kwh.
- After eight years, July 2006, EEPCO has once again adjusted its tariff with the intention of bringing the price back to USD 0.07 per kwh.

Electricity Tariff Background…

- The tariff rate set in July 2006 was not adjusted until December 2018, 12 years;
- From 2006 to 2018, the average electricity tariff is leaning in a descending way due to devaluation of ETB against USD

Electricity Tariff Background…



	1	2	3	4	5	6	7
Year	2006	2008	2010	2012	2014	2016	2018
USD	0.0728	0.0501	0.0301	0.0273	0.0245	0.0220	0.0181

Electricity Tariff Background…

- In order to realize Ethiopia's energy sector ambition, significant investment has been required. However, such rapid growth raises a number of questions for the Government, including:
  - How to secure funds to finance such an aggressive development and then
  - How to manage the power sector effectively and efficiently

Electricity Tariff Background…

- Declining effect of the tariff level has undermined the utilities' ability to finance investments required to meet the increasing demands of electricity.
- These became a major driving factor to set new tariff levels in December 2018 with the objective of generating sufficient revenue;
- Cost of Service Method has been chosen to derive the tariff levels so that utilities are able to cover cost of service at generation, transmission, distribution and customer service functions;

2. Rationale for Cost of Service Method

- **Recover costs** from each customer class on a reasonable basis
- Advance National Policies

3. Revenue Requirement

- Condition for revenue sufficiency of a utility:

  Revenue = Cost

4. Cost Elements

- Return on Regulatory Asset Base (RAB)
- Regulatory Asset Depreciation
- Operating Expenses
- Taxes

Cost Elements…

1. Return on Regulatory Asset Base (RAB)
   - This is the amount to be earned on the 'Net Asset Value'
   - Existing Assets must meet 'used and useful' criteria
   - New investments should be 'prudent'
   - The Rate of Return is based on WACC and Investment Policies

Cost Elements…

2. Regulatory Depreciation
   - The cost of consuming assets by wear and tear
   - Sends signals about expected level of system reliability
   - Depreciation method subject to policies and laws and Straight line method common, simple

Cost Elements…

3. Operating Expenses
   - Fixed and variable operating expenses which must contribute to the supply of electricity

3. Taxes
   - Corporate (Income) and other sector taxes
   - Subjected to Laws

3. COST OF SERVICE BUILDING BLOCKS

Step 1: Determine the costs by Function

Step 2: Classify the costs

Step 3: Allocate the costs

Step 4: Design the tariff

Step 1: Determine the costs by Function

The aim is to determine costs in each stage of the electricity supply chain

- Generation
- Transmission
- Distribution
- Supply/Customer Services

Typical Generation Costs

- Capital Expenditures (CAPX)
- Operation and Maintenance Expenses
- Electricity imports (regional)
- Fuel or water charges

Typical Transmission Costs

- Capital Expenditures (CAPEX)
- Maintenance of substation plant and equipment
- Clearance of lines (vegetation)
- Surveillance of lines (towers, insulators)
- Dispatch operations (System Operator)
- Line losses (technical)

Typical Distribution Costs

- Maintenance of distribution substation equipment
- Replacement, upgrading of lines and poles
- Inspections: lines, pillars, pole
- Clearance of lines (vegetation)
- Electricity purchase costs

Typical Supply/Customer Services Costs

- Metering and billing
- Call centre services
- Fault clearance
- Information and education

Step 2: Classify the costs

I. Energy Related Costs

- Costs incurred in delivery of **energy** (MWhr);
- dependent on amount delivered.

VARIABLE

II. Demand Related Costs

- The investment in **plant and equipment** required to maintain power supply (MW) ..
- **CONSTANT**
- Depreciation, Return on investment,…

III. Customer Related Costs

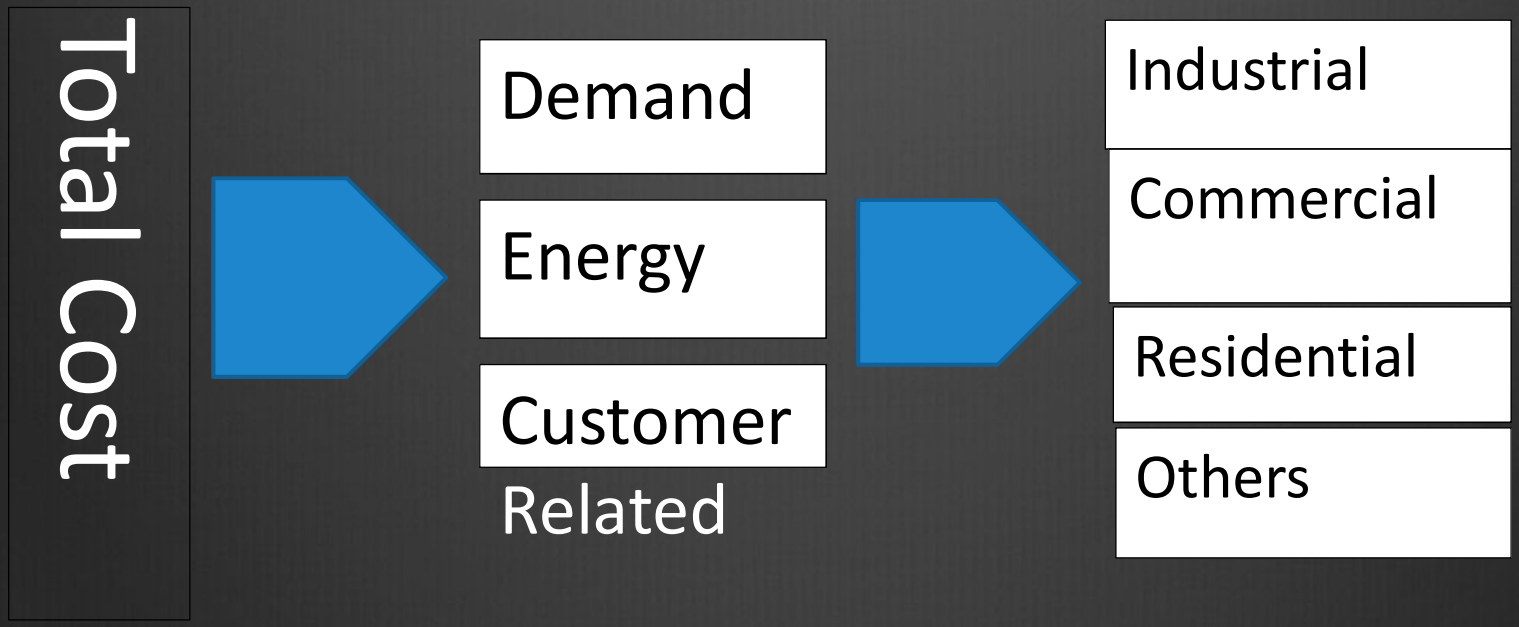
- Vary with the number of customers served, not energy usage
- Meter installation, meter reading, billing, call center services

Costs by Function and by Classification

Function	Demand Related	Energy Related	Customer Related
1. Generation	✓	✓	
2. Transmission	✓		
3. Distribution	✓	✓	✓
4. Customer Service			✓

Step 3: Allocate the costs

The classified costs need to be allocated to **customer classes**



5. Allocation Factors

- Cost allocation factors are used to assign costs to customer classes
- Coincident Peak and Energy consumption of each class are commonly used to develop allocation factors
- The allocation ensures that each class contributes to the total cost of supply according to cost causality

6. Cost Causality principles

- Customers should be charged for the infrastructure, energy and services used to meet their needs

7. Conclusion

- Social consideration has been factored into the tariff design process so that low-income consumers pay less than the cost to provide service;
- Due to lack of timely adjustment, the tariff impact was very significant.
- The rate structure is designed in such a way to facilitate metering and billing difficulties;
- Prices are allocated to a consumer class based on the cost to serve a particular load profile;
- The currently designed tariff is at the cost recovery level so that utilities can operate the facilities efficiently to ensure reliable electricity supply;


Discussion