

EXERCISE¹

(Summing up the steps in regulated rate setting)

The simplified balance sheet of an electric utility company can be seen below. All sums in the table are expressed in US dollars (Thousands).

ASSETS	('000 USD)	LIABILITIES	('000 USD)
Current Assets	25,400	Current Liabilities	16,300
Cash and cash equivalents	5,600	Accounts payable	5,400
Accounts receivable	9,800	Deferred taxes	3,800
Inventory	6,300	Short-term borrowings	7,100
Other	3,700	Long-term Liabilities	173,100
Fixed Assets	320,000	Long-term debt	173,100
Network and machinery	400,000	Shareholders' equity	156,000
Accumulated depreciation	-80,000	Common stock	86,000
		Retained earnings	70,000
Total Assets	345,400	Total Liabilities	345,400

Balance sheet of a hypothetical distribution company in 1000 dollars (December 31, 2006)

The fixed part of operating and maintenance expenses amounts to 24.5 million dollars, including personnel expenses, network maintenance costs, non-income taxes and overhead.

The utility can purchase electricity at an average wholesale price of 30 USD/MWh and pass on the energy to consumers at the same price. Distribution network loss, on average, is around 9.5% of energy entering the network.

Expected service life of network elements and machinery is 20 years, with a net salvage value of zero. Current depreciation policy (which is approved by the regulator) is linear (whole life) and corresponds to expected service life.

The regulator uses before-tax WACC as justified rate of return. Risk free rate of return is 6 %, CAPM Beta is 0,5, market risk premium is 4 % (after tax). Rate of return on borrowings is 8 %. Corporation tax rate is 16 %. Capital structure as in the balance sheet.

The utility forecasts a demand of 10 TWh of electric energy for the upcoming year (assumed to be independent of price, for simplicity).

1.1. Calculate the rate base (working capital is also part of the rate base).

Hint: working capital refers to the difference between current assets and current liabilities

1.2. Calculate the before-tax WACC.

¹ Based on ERRA Training exercise worked out by experts of Regional Centre for Energy Policy

1.3. Calculate the Revenue Requirement.

1.4. Calculate the single price of electricity distribution service in the area.

Hint: You know the RR and also the amount of electricity supplied.

1.5. How would be the financial position of the utility company if it managed to reduce network loss to 8 % (of energy entering the network). All other conditions are unchanged.

1.6. How would be the financial position of the utility company if the real demand (final consumption) were 11 TWh instead of the estimated 10 TWh? All other conditions are unchanged.

1.7. How would be the financial position of the utility company if the average wholesale price increased up to 32 USD/MWh (instead of 30 USD/MWh) and there were not possibility to raise retail prices? All other conditions are unchanged.

1.8. Due to a new regulation 5 % of the final consumption have to be bought from generators producing electricity from renewable energy sources (RES-E). How much will be the single price of electricity distribution, if the uniform feed-in tariff for RES-E is 50 USD/MWh (energy cost is a pass through element, there is no profit or loss on it)?