



From costs to regulated prices – setting electricity, gas and district heating prices in Lithuania

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presented at the NARUC/ERRA Training on Public
Utility Regulation and Tariff Development

November 5-8, 2007, Pristina, UNMIK/Kosovo

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Different interests in pricing

- ▶ consumers want low prices and high quality
- ▶ energy companies want to maximize their profits
- ▶ politicians want low prices (especially for residential consumers – voters) but also want to protect companies – sponsors of election campaigns
- ▶ regulators want fairness – balance interests of all

Pricing is a two step procedure

1. Regulator determines revenue requirements for the regulated company
2. Regulator chooses a tariff structure which allows the company to obtain enough revenues to cover its cost and earn a reasonable return

alternatively

Regulator revises a tariff structure proposed by the company – *this approach is used in Lithuania*

Rate base or regulatory asset base (RAB)

- ▶ RAB usually means fixed assets and some other assets used in the regulated activity
- ▶ RAB value determines the gross cost of capital (depreciation + operating profit)
- ▶ depreciation revenues should be sufficient to replace assets otherwise the company will be worn out
- ▶ allowed return on invested capital should attract capital for new investments

Regulator has to revise the regulatory asset base

- ▶ to make an independent valuation of the assets
- ▶ calculate current value on the basis of historical costs corrected by using indexation factors
- ▶ if price paid by the investors during privatization exceeds the fair value of assets, only the fair value of assets should be considered
- ▶ if assets were re-evaluated after privatization how the regulator should treat them? *Lithuanian example*

Other items in revenue requirements - expenditures

- ▶ Operating and maintenance costs
 - ◆ purchase of goods and services
 - ◆ maintenance
 - ◆ wages and social insurance
 - ◆ services (transportation, communications, IT, bank's)
 - ◆ inventory costs
 - ◆ other
- ▶ Depreciation expenses
- ▶ Taxes (various)

Problems of cost evaluation

- ▶ historical costs
 - ◆ depends on how efficient was the company
- ▶ future costs
 - ◆ how the forecasts are calculated
- ▶ value of assets
- ▶ valuation of investments
 - ◆ before investment or after

Example: costs after restructuring

- ▶ Lithuanian Energy company was restructured into 5 companies in 2002
- ▶ new network companies (transmission and distribution) are regulated
- ▶ it was hard to use historical costs but this was a good starting point
- ▶ benchmarking with other companies was used

Functionalization of costs

- ▶ Production (electricity, heat generation)
- ▶ Transmission (electricity and gas transportation from generation sources to the distribution system using high voltage lines or high pressure pipes)
- ▶ Distribution (electricity and gas transports from the transmission system to the final customers)
- ▶ Customer service provides customers with customer accounting, billing and collections, customer service
- ▶ Transmission and distribution services are highly capital intensive with a large proportion of fixed costs, customer service almost does not depend on demand

Classification of costs

- ▶ Demand or capacity cost varies according to the maximum demand (maximal load), could be coincident or non-coincident, $f(\text{kW or m}^3/\text{h})$
- ▶ Energy cost is related with usage of the system, $f(\text{kWh, or m}^3, \text{ or Gcal, or GJ})$
- ▶ Customer cost varies according to the number of customers receiving service, $f(\text{No of customers})$

Cost functionalization and allocation in Lithuania

- ▶ In the electricity sector costs are functionally split into generation, transmission, distribution and supply
 - ◆ customers connected to the distribution system (and their costs) are split according to the voltage level – medium or low voltage
 - ◆ low voltage customers are split into commercial and residential ones
- ▶ In the gas sector cost are functionally split into transmission, distribution and supply
 - ◆ customers connected to the distribution grid are split into 5 groups according to the consumption levels
 - ◆ additionally customers are split into residential and commercial ones

Benchmarking – useful tool

- ▶ if you have many companies you may use benchmarking to evaluate their costs
- ▶ it is important to define correct indicators for the comparison
- ▶ it could be a number of employees per customer, per kWh distributed or sold, inputs (electricity, water, etc.) per unit of output, etc.

Example: benchmarking in district heating

- ▶ there are about 60 district companies in Lithuania regulated by the NCC
- ▶ they are allocated into 5 groups depending on the output (heat sold)
- ▶ indicators for comparison are defined
- ▶ technological indicators: losses in the grid, fuel efficiency, electricity and water consumption per kWh sold, etc.
- ▶ operational efficiency: number of employees per kWh sold, per 1 m of pipes, per customer, share of fixed cost elements in the total, etc.

Example: benchmarking in district heating (cont.)

- ▶ NCC analyses historical costs of the district heating companies
- ▶ NCC benchmarks different costs
- ▶ if average costs in the group are lower NCC usually includes into the required revenue (RR) sum those costs not the historical ones
- ▶ company has the right to prove why their historical costs are higher
- ▶ if the company's historical costs are lower they are taken into the RR sum

Data collection by the regulator

- ▶ data from the public statements is not sufficient for the price setting
- ▶ it's important to understand company's accounting policies and rules
- ▶ regulatory chart of accounts should be adopted
- ▶ frequency of reporting
- ▶ regular and standard data provision reduces room for manipulations and increases accuracy

Unbundling of different activities

- ▶ main aim of unbundling – to have fairly defined transmission prices for the electricity trade
- ▶ in the EU electricity and gas sectors all main activities should be legally separated
- ▶ unbundling of generation, transmission, distribution and supply activities in a vertically integrated monopoly may increase transparency of pricing

Unbundling in Lithuania

- ▶ in the electricity sector NCC started to calculate separate generation, transmission, distribution prices before the restructuring – it gave consumers understanding how the final price is formed
- ▶ similar approach was used in the gas sector – to understand how much the Gazprom's price affects the final price
- ▶ in the district heating heat generation and transmission prices are calculated separately – for the transparency

Advantages and deficiencies of rate of return regulation

pro

- ▶ revenues cover costs
- ▶ profits acceptable
- ▶ adequate supply services

con

- ▶ no incentives to cut costs
- ▶ weak efficiency incentives
- ▶ frequent reviews of costs

Price cap regulation

- ▶ likely costs are estimated for a longer time period, 3-5 years
- ▶ price caps are calculated for the initial period and revised every year using simple formula

$$P_t = P_{t-1}(1 + \text{inflation} - \text{efficiency})$$

- ▶ at the end of the regulatory period costs are revised and new caps established

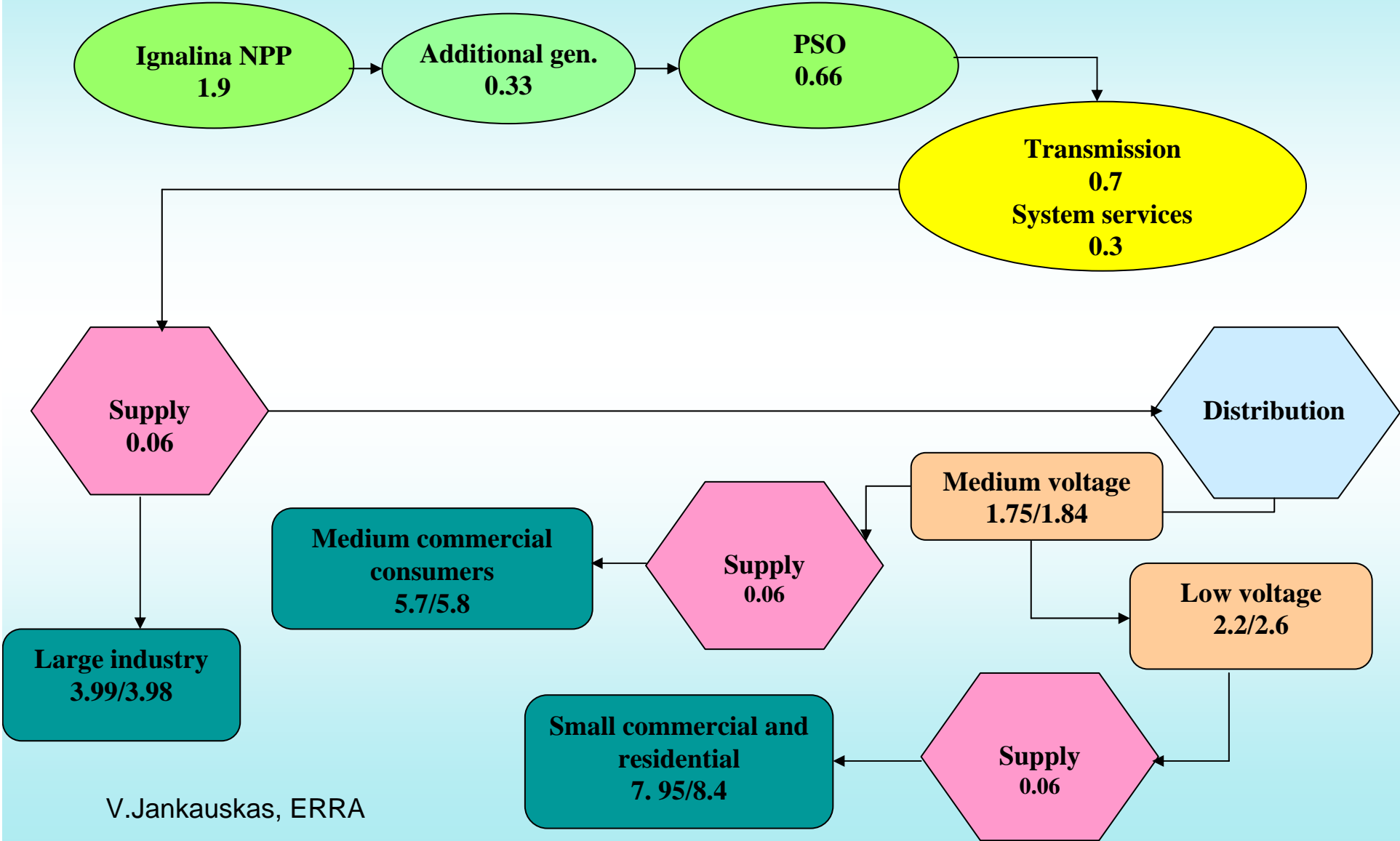
Advantages of the price cap regulation

- ▶ provides strong incentives to the companies to reduce costs
- ▶ gives stability and predictability to the consumers and investors
- ▶ significantly reduces the regulatory burden as costs should be evaluated only once in 3 or 5 years
- ▶ *price cap regulation is used in Lithuania for the electricity, gas and district heating pricing*

Price caps in the electricity sector

- ▶ price caps for electricity transmission, distribution and supply activities are set by the NCC for 3 years
- ▶ usual asset valuation, cost analysis, rate of return setting principles applied
- ▶ once a year price caps are adjusted
- ▶ theoretically generation prices are set by the market but due to the dominant producer prices are regulated
- ▶ tariff structures and final tariffs are set by the distribution companies, NCC controls if there is no discrimination and price cap not exceeded

Planned average electricity tariff in 2007, RST/VST, ct/kWh



Residential electricity tariffs, VAT included, € ct/kWh

	Tariff	2006	2007
1.1	Simple	9	9.6
1.2	- consumers with electrical stoves	7.8	8.4
1.3	- consuming more than 12 MWh/year	7.2	7.8
2	Time of use		
2.1	- day	10.4	11
2.2	- night, weekend	5.8	6.1
2.3	- day with electrical stoves	8.7	9.3
2.4	- night, weekend with electrical stoves	4.6	5.2
2.5	- day, consuming more than 12 MWh/year	8.4	9
2.6	- night, weekend -"-	4.3	4.9

RST electricity tariffs for medium voltage consumers, 2007

Tariff	units	I plan	II plan	III plan
Two-component tariff				
capacity charge	€/kW/m	0.35	0.77	1.5
energy charge	€ ct/kWh	5.6	5.3	5.1
Two-component capacity and day and night tariff				
capacity charge	€/kW/m	0.35	0.77	1.5
day energy	€ ct/kWh	5.9	5.6	5.4
night energy	€ ct/kWh	4.2	3.9	3.6
Two-component capacity and time of use tariff				
capacity charge	€/kW/m	0.35	0.77	1.5
minimal load	€ ct/kWh	4.2	3.9	3.6
medium load	€ ct/kWh	5.1	4.8	4.6
peak	€ ct/kWh	7.6	7.3	7.1
weekends	€ ct/kWh	4.2	3.9	3.6

Price caps in the Lithuanian gas sector

- ▶ price caps for the 5 year term are set by the NCC for transmission, distribution and supply services
- ▶ for the initial calculations all costs are revised, assets evaluated, rate of return set
- ▶ Lithuanian Gas company develops the final structure and NCC approves it
- ▶ prices are adjusted annually, accounting for the inflation, fluctuations in the volumes of gas transported, changes in taxes and efficiency set by the NCC
- ▶ if profit exceed certain limits, profit sharing mechanism is applied

Natural gas tariffs in 2007

► residential, with VAT

	fixed, €/month	variable, €/m ³
<90 m ³	-	0.36
90-800 m ³	0.6	0.26
800-20000 m ³	3.5	0.19

► commercial consumers pay

- ◆ fixed charge (supply)
- ◆ demand charge (max demand during peak, in m³/h)
- ◆ energy charge, €/m³
- ◆ consumers are split into several groups

Price caps in district heating

- ▶ price caps for the district heating are set for 3-5 years, all costs are analyzed, benchmarking used, assets value revised, ROR set
- ▶ prices are adjusted by formula evaluating not only inflation but also changes in fuel prices, degree days, taxes

District heating prices in Klaipeda

heat production tariff		
simple		21 €/MWh
two-component	4.3 €/kW/month	15 €/MWh
heat transmission tariff		
simple	11 €/MWh or 7.7 €/kW/month	
production and transmission		
simple		29 €/MWh
two-component	7.7 €/kW/month	19 €/MWh
customer charge		
1 €/month		

Thank you for your attention!