The elaboration and implementation of new rules for CAPEX remuneration as one of the elements of balancing interests of the energy enterprises and consumers

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Capacity Building for Sustainable Energy Regulation in Eastern Europe and Central Asia
Cost of electricity for consumers

- Generation costs
- Transmission costs
- Operating costs
- Depreciation
- Operating profit - return on capital invested

Costs which depend on the value of network assets

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Energy cooperation between the EU, the littoral states of the Black & Caspian Seas and their neighbouring countries
Situation in Poland

- Last re-evaluation in 1995
- High cumulative rate of inflation
  \(1994 = 100 \rightarrow 2008 = 261\)
- Consolidation and privatisation of distribution companies
- Unbundling of distribution system operators
The Retail Price Index in Poland (1995-2009)
Distribution System Operators

History of distribution system operators

Before 2002 (1994 - 2002) - 33 regional distribution companies ("DC"), integrated distribution and supply business (some of the distribution companies were the owners of renewable energy resources)
Distribution System Operators

History of distribution system operators (1)

2000 - Privatisation of Górnośląski ZE SA / purchased by Vattenfall
2002 - Privatisation of STOEN SA / purchased by RWE
2003 - Consolidation of 5 DCs into GE ENEA SA
2004 - Consolidation of 5 DCs into EnergiaPro KE SA
2004 - Consolidation of 5 DCs into ENION SA
2005 - Consolidation of 8 DCs into KE Energa SA
2006/2007 - Establishment of energy groups (ENEA, TAURON, ENERGA and PGE). Merger of DCs and big generation companies.
2007 - Unbundling of distribution system operators.
Distribution System Operators

History of distribution system operators (2)

2008 - Privatisation of ENEA group on the Warsaw Stock Exchange ("WSE"). Minority share purchased by Vattenfall.
2009 - Privatisation of PGE group on the WSE
2010 - Privatisation of Tauron group on the WSE
2010 - Consolidation 8 DSOs of PGE group into PGE Dystubucja SA
2010/2011 - Privatisation of ENERGA group (purchase by PGE Group blocked by the Antimonopoly Office, the privatisation depends on the Court decision)
2010/2011 - Plans to privatise unsold shares of ENEA group to strategic investors (negotiations with EdF).
Distribution System Operators

History of distribution system operators (3)

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ENERGY COOPERATION BETWEEN THE EU, THE LITTORAL STATES OF THE BLACK & CASPIAN SEAS AND THEIR NEIGHBOURING COUNTRIES
Influence of privatisation on the future energy prices

- Higher privatisation price – higher future energy prices (for 99.9%)
- Lower privatisation price – lower future energy prices (probably, but higher prices possible)
- The privatisation price depends on the value of risk estimated by investors
- The predictable rules of regulation lower the risk
- The elaboration and implementation of new rules for CAPEX remuneration helpful in privatisation process
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RAB vs BV in 2008

BV as % of RAB

Average, DSO 1, DSO 2, DSO 3, DSO 4, DSO 5, DSO 6, DSO 7, DSO 8, DSO 9, DSO 10, DSO 11, DSO 12, DSO 13, DSO 14, Average

ENERGY COOPERATION BETWEEN THE EU, THE LITTORAL STATES OF THE BLACK & CASPIAN SEAS AND THEIR NEIGHBOURING COUNTRIES
Analysed methods of RAB valuation

HC – Historic Cost
IHC – Indexed Historic Cost
OHC - Optimised Historic Cost
RC – Replacement Cost
ORC – Optimised Replacement Cost

Based on assets

MV – Market Value
DCF – Discounted Cash Flows

Based on income

DV – Deprival Value
ODV – Optimised Deprival Value

Mixed

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DV – Deprival Value

**Definition:**
How much the company would be worse off if it were to be deprived of the asset (e.g. by selling it, or it being worn out after years of use as a fixed asset) investor.

**Calculation:**
The deprival value of any asset can be defined as the lower of its:
- replacement cost (if it can in fact be replaced) - i.e. its value in exchange in the market in which the company can purchase the item
- its recoverable value - the value that the company could create by using the asset within the business.
RC – Replacement cost

The taskforce (with representatives of the Energy Regulatory Office, Association of DSOs and Ernst&Young consultants) elaborated:
1) unit costs of the grid assets (typical lines, transformers, etc.)
2) time of depreciation of assets.

Only 80% of assets (according to their book value) was valuated.

The rest 20% was taken with their BV.
EV – Economic value

Assumptions:
- Constant energy delivery
- Only modernisation of existing assets
- Real increase of distribution prices: range 1.1 – 1.7%, finally 1.18%
- 40-year depreciation period
- 20-year forecast
Old RAB vs BV, RC nad EV

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ENERGY COOPERATION BETWEEN THE EU, THE LITTORAL STATES OF THE BLACK & CASPIAN SEAS AND THEIR NEIGHBOURING COUNTRIES
Old valuation of RAB and return on capital

Influence on 2009:
DSO return on capital included in tariffs $\rightarrow + 0.2\%$
DSO costs $\rightarrow + 0.2\%$

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Energy cooperation between the EU, the littoral states of the Black & Caspian seas and their neighbouring countries
New valuation of RAB and potential return on capital

Influence on 2010:
DSO return on capital included in tariffs $\rightarrow +161\%$
DSO costs $\rightarrow +22\%$

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Energy Cooperation between the EU, the littoral states of the Black & Caspian seas and their neighbouring countries
Electricity prices in Poland

- Electricity
- Network charges
- Total
- Inflation

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ENERGY COOPERATION BETWEEN THE EU, THE LITTORAL STATES OF THE BLACK & CASPIAN SEAS AND THEIR NEIGHBOURING COUNTRIES
New valuation of RAB and final return on capital

Influence on 2010:
DSO return on capital included in tariffs → + 30%
DSO costs → +3.5%
Return on capital

RAB at the beginning of year $t$

WACC for year $t$

$$Z_t = \min \left\{ WRA_t \times WACC_t, \ Z(BO)_t + Z(I)_t \right\}$$

RoC included in calculation of tariff for year $t$

RoC from investments finished before 31 December 2008

RoC from investments realised from 1 January 2009
Return on capital for year 2010

\[ Z_{2010} = Z(BO)_{2010} + Z(I)_{2010} \]

\[ Z(BO)_{2010} = Z(BO)_{2009} + 1,5\% \times PR(BO)_{2009} \]

RoC included in calculation of tariff for year 2009

Corrected regulated revenue (less part of revenue arisen from new investments)
Return on capital

\[ Z(BO)_{2010} = Z(BO)_{2009} + 1,5\% \times PR(BO)_{2009} \]

\[ PR(BO)_{2009} = PR_{2009} - AI_{2009} \]

Regulated revenue approved by the President of the Energy Regulatory Office

Depreciation from investment realised after 1 January 2009

\[ PR(BO)_{t-1} = PR_{t-1} - Z(I)_{t-1} - AI_{t-1} \]
Return on capital

\[ \text{PR(BO)}_{2009} = \text{PR}_{2009} - \text{AI}_{2009} \]

\[ \text{AI}_{2009} = \frac{I_{2009}}{2} \times r\text{A}_{2009} \]

- Investment included in calculation tariff for year t
- Average depreciation rate

\[ A\text{I}_t = A\text{I}_{t-1} + \frac{I_{t-1} + I_t}{2} \times r\text{A}_t \]

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ENERGY COOPERATION BETWEEN THE EU, THE LITTORAL STATES OF THE BLACK & CASPIAN SEAS AND THEIR NEIGHBOURING COUNTRIES
Return on capital for year 2010

\[ Z_{2010} = Z(BO)_{2010} + Z(I)_{2010} \]

**WACC for year 2010**

\[ Z(I)_{2010} = (I_{2009} - OP_{2009} - AI_{2009}) \times WACC_{2010} \]

- **Investment included in calculation tariff for year t**
- **Connection charges included in calculation of tariff for year 2009**
- **Depreciation from investment realised after 1 January 2009**

\[ Z(I)_t = \left( \sum_{j=2009}^{t-1} I_j - \sum_{j=2009}^{t-1} OP_j - \sum_{j=2009}^{t-1} AI_j - \sum_{j=2009}^{t-2} \Delta I_j \right) \times WACC_t \]

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**Energy Cooperation between the EU, the Littoral States of the Black & Caspian Seas and Their Neighbouring Countries**
The CAPEX influence on distribution costs (1)

Transmission costs
Energy losses
Other costs
Property taxes
Operating costs
Depreciation
Return on capital
The CAPEX influence on distribution costs (2)
The CAPEX influence on distribution costs (3)

Influence on 2011:
DSO return on capital included in tariffs \(\rightarrow +23\%\)
DSO costs \(\rightarrow +3.1\%\)

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Energy cooperation between the EU, the littoral states of the Black & Caspian Seas and their neighbouring countries
The CAPEX influence on distribution costs (4)

Theoretical influence on 2011:
DSO return on capital included in tariffs → + 51%
DSO costs → +7.5%

2011 structure with theoretical 100% of RAB remuneration

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Thank You for Your Attention!

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