

Current status and future challenges of the reform

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Russian power sector reform – ERI RAS involvement

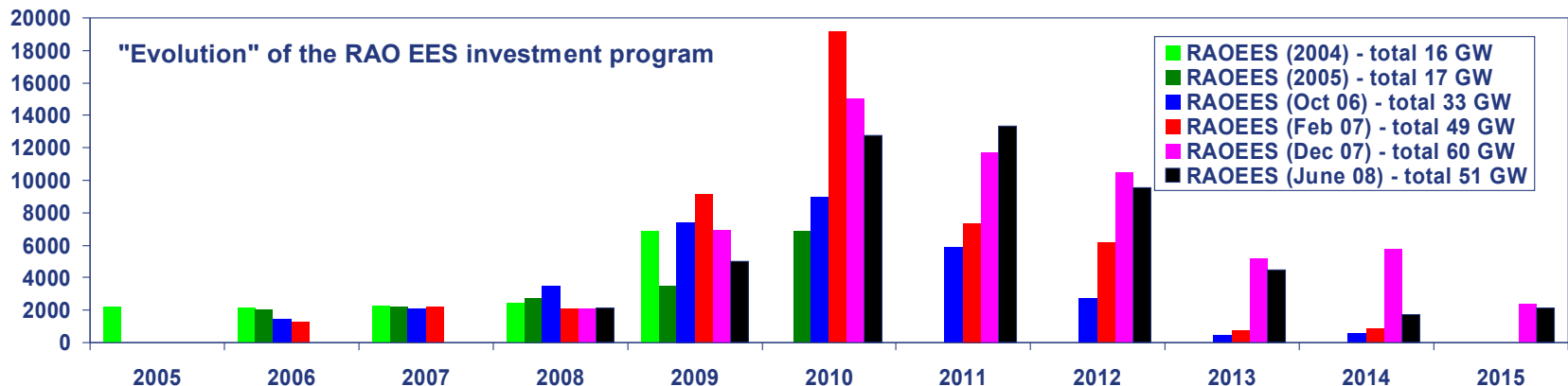
- ❖ 1996-97 - World Bank activity for the power sector restructuring resulted to the RF President Decree for the reforming of natural monopolies. ERI RAS was the main WB contractor in elaboration of the reform profile.
- ❖ 2000-01 – Start of the reform. ERI RAS provided the system and economical background and recommendations for the new RAO EES management command (Power Sector strategy to 2020, Reform of the Power sector in the context of Energy Strategy, Concept of the RAO EES investment policy in the competitive environment and restructuring)
- ❖ 2003-2007 – Reform implementation. ERI RAS provided methodological, modeling and analytical support to the RAO EES in the regular elaboration of the 5 year corporate and sector development plan
- ❖ 2007+ - Reform After RAO. ERI RAS takes part in developing of the State power sector strategic planning and forecasting system at the federal level (Energy Strategy to 2030, General Scheme of the Power Assets Allocation, Power Sector Modernization Program)
- ❖ 2010 – ERI RAS prepared recommendations for the Russian Federal Antimonopoly Service in the area of capacity market pricing control and system-based methodology for the economically reasonable capacity prices forecasting

Different fundamental drivers required the different model of the reform...

- ❖ **In the developed countries (EU, US, AU, etc.) the reform started under the low demand growth and was naturally focused on the operational aspects:**
 - operational efficiency improvements
 - huge capacity surplus optimization and stopping of the overinvestment in the sector
 - ensuring the lower prices in respect to their actual high levels
- ❖ **Russian power sector was in essentially different situation:**
 - high demand growth as a natural feature of the developing economy
 - high underinvestment of the sector in the past decade 1990s
 - low actual electricity prices and inefficient politically-driven regulation
 - urgent needs for modernization due to the high depreciation and low thermal efficiency of capacities
- ❖ **Fundamental targets of the reform in Russia were essentially different comparing to the targets under the “classical situation” and focused on the long-term effects:**
 - create new pricing trend matching the long-term marginal costs of supply (ensure higher not lower prices)
 - Prevent the investment deficit and create the stable large-scale inflow of the external investment resources and their efficient allocation for the sector renewal and development
- ❖ **But Russia choose a “textbook model” of the intensive reform that is naturally focused on another set targets**

Administrative RAO EES investment plans

- ❖ Investments were not a key priority of the reform process at the beginning aimed at making as more and faster competition as possible. It was considered as an option that will be self-resolved by the new market after the reform
- ❖ Re-direction to the investment issues was politically driven by the (1) eligible risks of capacity deficit during the period of intensive economic growth and (2) preparation to the generating asset privatization
- ❖ RAO EES investment program together with fantastic demand expectations created the overoptimistic market prospects for investors who paid near 1 trln Roubles to “share these dreams”
- ❖ Effect of “investment bubble” was also intended to make an powerful administrative impetus to launching the investment process in the nearest post-reform years in the absence of market mechanisms of its support.

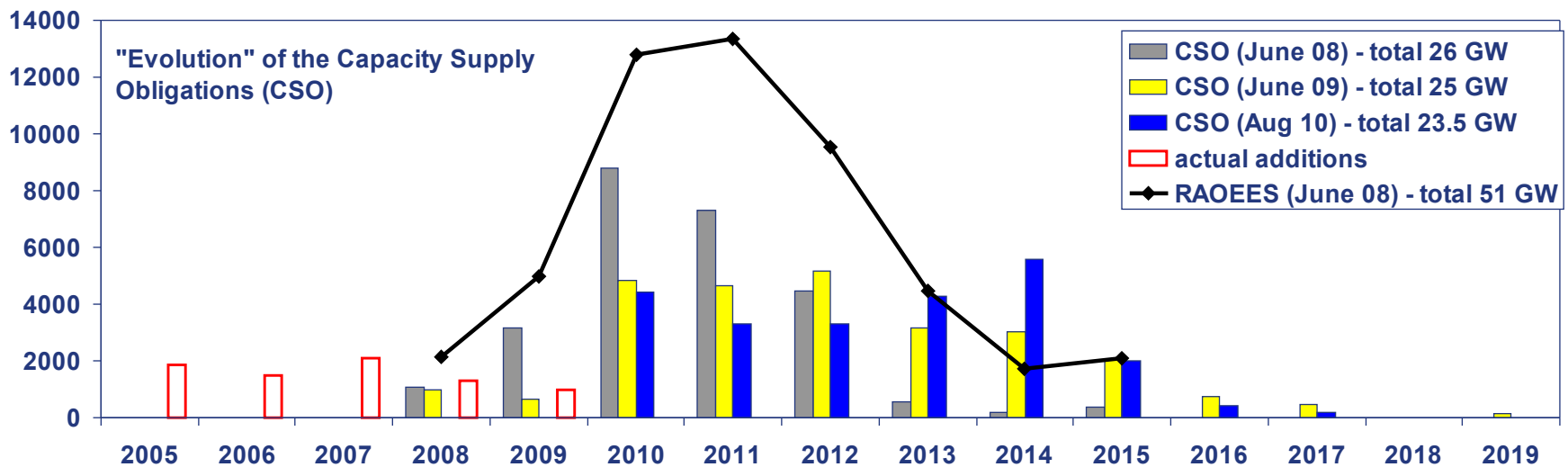


The life after RAO EES. Strong deficit of the manageability

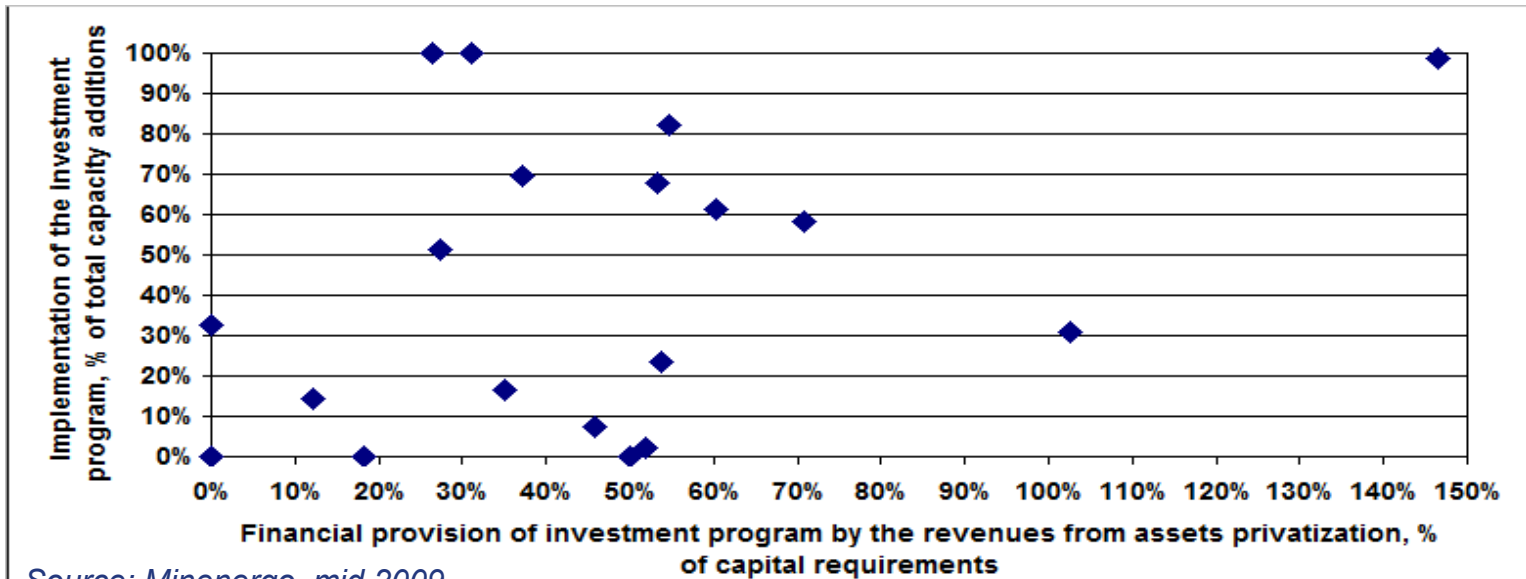
With RAO EES	After RAO EES
<ul style="list-style-type: none"> ❖ Highly centralized management and strategic planning in the RAO EES (in fact – responsibility for the whole sector) ❖ Strong corporate mechanisms of investment decisions adoption and implementation in the state-controlled Holding ❖ Tariff mechanisms of direct State influence on the corporate investment programs ❖ Huge centralized investment resource (RAO EES investment fund formed from tariff) 	<ul style="list-style-type: none"> ❖ Appearance of new decision making centers that did not ever have the competence in area of strategic sector planning (Ministry of Energy, System Operator, Federal Grid Company) ❖ Absence of corporate mechanisms of the influence on privatized generating companies ❖ Weakness of the tariff mechanisms after the market liberalization ❖ Absence of the centralized investment resource in the sector

Transition/degradation to the “manual” control

- Privatization of OGK and TGK was accompanied by the investment obligations to make capacity additions – so-called Capacity Supply Obligations (CSO).
- The strategic task of the reform was transferred to the new owners without distinct administrative and economic measures of influence on their investment behavior.
- Faced with the sector reality and economic crisis new owners started to optimize (or minimize) the investment programs and redirected to the operational efficiency improvement and profitability of the existing assets.
- As a result, the Government had to introduce the “manual” control for the investment activity with strong administrative attention on the implementation of CSO
- At this parameters of CSO were changed and re-considered on the basis of agreements and compromises with owners not on the basis of system optimization



Investment capabilities of new players



- ❖ Privatization revenues did not cover all investment needs of OGK and TGK related with CSO – and the situation is extremely different across companies. External financing is required for most of companies
- ❖ The scale of GenCos may be the barrier creating the additional risks for the financing (average OGK 2009 earnings is near \$1.4 bln and new 400 MW CCGT unit costs near \$0.5 bln that is ~30% of annual OGK earnings)
- ❖ Mergers in generation will allow to form more powerful and financially stable companies – of course, deteriorating the competitive environment.
- ❖ Making two “national champions” (Gazprom group with \$7.8 .bln and InterRAO with \$6.2 bln) the Government will also facilitate the strategic control in the sector

Capacity market – strong control on the pricing

- 4-year ahead market bids
- Zonal marginal pricing – 29 Free Capacity Flow Zones
- 85% of supply rule for the pricing (15% of the most expensive bids are not accounted in price setting)
- Monopolization and market power control (overlapping limitations):
 - Cap price in the Zones with a lack of competition (set to 2011 for 26 of 29 free flow zones)
 - Control for the affiliated generators
 - Control for the economical reasonability of capacity bids (under developing):
 - bidding history of each supplier
 - benchmarking the bids from different plant types and reference “typical” plants
 - accounting of revenues from electricity (spark spread) and heat markets
 - system assessment of alternative investment decisions (incl. transmission projects and generation in the adjacent Zones and maybe consumers with load management capabilities)
 - system-wide optimization for the economic grounding of cap[prices

Capacity market – place for the selection of existing capacities

Capacity segment	Competitive?	2015	2020
Total capacity requirement		233.7	275.2
Existing hydro & nuclear	Yes, price-takers only	69.2	65.4
New hydro & nuclear	No, special capacity payments set by the regulator	12.5	23.7
Existing thermal	Yes	137.8	132.0
New thermal under CSO	No, special capacity payments set by the regulator (or PPA)	24.5	25.9
New thermal - other	Yes	(-10.3)	28.2

Capacities involved in real competition (% of total) **60%** **58%**

New capacities involved in competition (% of additions) - **only 33%**

- ❖ Until in the mid-term prospect, capacity market will not be the place for making of the most investment decisions for generating capacity expansion
- ❖ But it must be used as a tool for the intensive modernization and repowering of existing capacities by OGK and TGK (esp. at the gas-fired plants)
- ❖ The same amount of GWs and investments comparing with the capacity expansion still not covered by actual investment activity

How much competition is enough?

Pure competition at the wholesale level seems to be very risky, especially in the case of the capacity market development:

- ❖ grid weakness – too many capacity zones
- ❖ ownership structure – many agents but few owners (esp. with mergers)
- ❖ many capacities under “forced” operation modes (like CHPs)
- ❖ complicated operation at the competitive (electricity, capacity) and regulated (heat) markets for CHP
- ❖ economic stimulus are required for different types of generation, with different competitiveness

Harmonization of competition and economic stimulation mechanisms is required:

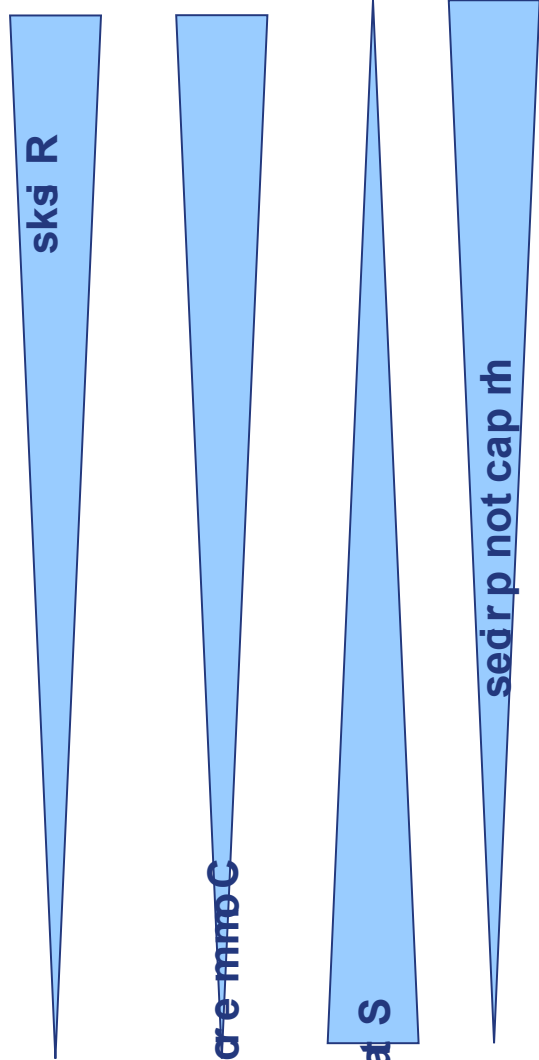
- ❖ more competitive operational part of the market (electricity)
- ❖ more guaranteed investment part of the market (capacity) through the diversity of competition types providing different “profitability/risk” opportunities for the investors and companies

Investment challenge will have more than one answer

Long-term capacity market
Provides competition between GenCo's existing and new capacities based on the optimization of their bids (costs)

Investment guarantee mechanism
Provides competition between the investors at the project implementation stage - for the contracts to build new IPP-type capacity of the pre-defined type and location – with guaranteed pricing conditions after commissioning

Centralized financing
Capacities are centrally financed and after commissioning transferred to the GenCo's (sale or lease format)
Provides competition at the operation stage between GenCos - for further operation of new plants and their profitability at the competitive electricity and capacity markets



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Thanks for attention