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ELECTRICITY SECTOR RESTRUCTURING IN RUSSIA: MISMATCHING GOALS AND STRATEGIES

1. Russia's electricity sector: from transition to restructuring

Transition of the Russian electricity supply industry (ESI) from central planning to a market economy started ten years ago, in 1992. The system was reformed so as to bring it in line with the regulatory practices of mid 90-es in many countries with large territories. Major transition avenues were: privatization, commercialization, development of a new regulatory framework, setting up new institutions (1995), geographic separation of 74 vertically integrated companies and related partial delegation of regulating power from the center to regions. In 1993, Russia established a "wholesale market", which was characterized by lack of competition and completely regulated prices, to trade electricity mainly among vertically integrated companies with a very limited involvement of large industrial customers (only 26 in 2002), none of whom were allowed to choose their supplier. Ownership, control and pricing policies became the focal points for hot discussions. The holding company called United Energy System (EES Rossii) was set up (see Fig. 1). Capitalization of EES Rossii is $7.85 billon in 2002. They have 340 daughter companies.

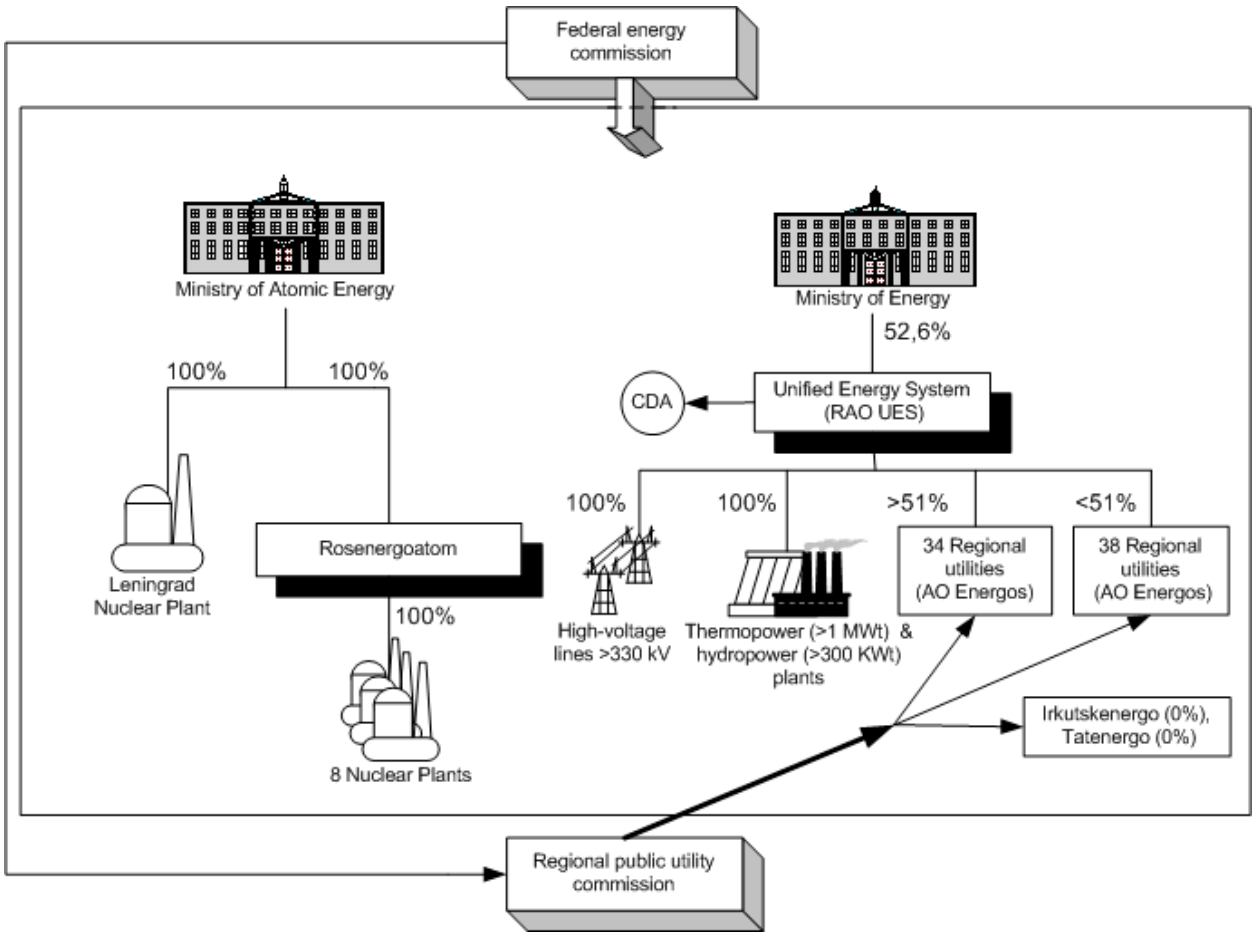

Fig. 1. Ownership and regulatory structure of Russia's Electricity Sector after transition period

Many parties are not happy with the final transition results. Electricity generation declined substantially (see Fig. 2), however, less than GDP. After transition, Russia ended up with a less economically productive, and non-transparent, system with high excessive capacity, reduced role of the central government, and increased influence of ESI and regional governments. Parties looking back for a higher degree of the central control, as well as those looking for further liberalization of the power market, view the transition results as not satisfactory. Electricity suppliers fight the Federal and regional energy commissions, as well as governments, for their unwillingness "to stamp" requested price increases as fast as they want. They are looking for less control, and view restructuring as a way to escape regulation, rather than a vehicle to reduce costs.

There is no consent, whether electricity is too cheap or too expensive. RAO EES Rossii, Ministry of economic development, Federal Energy Commission, very large industrial consumers (like aluminum industry), regional authorities, experts have not agreed so far on the issue of "economically reasonable electricity prices". ESI advocates are not happy with the present level of prices, or with a substantial influence of regional governments on the pricing policies. They describe these policies as "artificial restraining of prices"[1]. ESI managed to get an approval for 20% price increase since March 2002, but they are still hungry for additional 38% price growth by the end of 2002. Many outside experts, including IEA, agree with them[2]. Some Russian experts are of a different opinion. ESI production costs and investment decisions are not transparent even for the government, which still controls the power sector[3]. The author argues, that stabilization of real electricity tariffs for several years (1997-1999) was a natural reaction to surpassing monopolistic upper limit of price in 1996[4] (see Fig. 3). Andrey Illarionov, economic adviser to President Putin, thinks that electricity is overpriced in Russia and profitability of this monopolistic unproductive industry is much above those in industries working on competitive markets. He argues, that re-distribution of incomes in favor of ESI would brake economic growth[5]. Gennady Kutovoi, Chairman of Federal Energy Commission, believes, that for some period of time electricity tariffs can be kept constant, and potentially they can even be reduced by 30-40%[6].

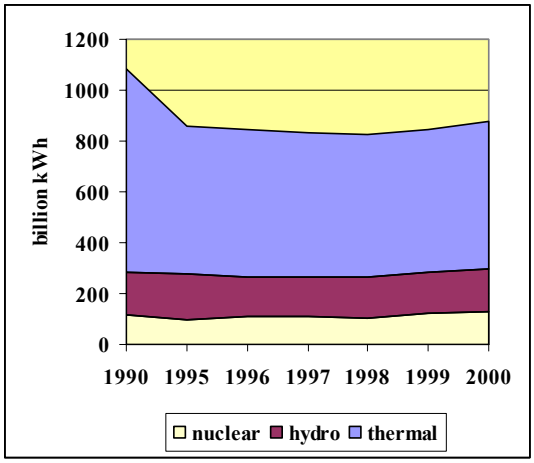

Fig. 2. Electricity generation in Russia

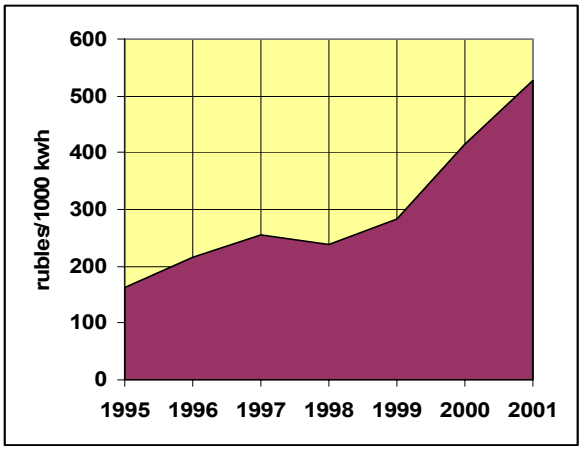

Fig. 3. Average electricity prices

[1] Term used in "Energy Strategy of Russia till the year 2020".
[2] See World Energy Outlook. Looking at Energy Subsidies: Getting the Prices Right. OECD/IEA. Paris. 1999; Energy Strategy of the Russian Federation. Review 2002. OECD/IEA. Paris. 2002.
[3] Government has 52,6% in the RAO EES Rossii capital. Foreign investors own 30,6% of the capital.
[4] See I. Bashmakov. Energy Subsidies and "Right Prices". "Energy Efficiency". Issue 27. April-June 2000. and I. Bashmakov. Energy Efficiency. From Rhetoric To Action. M., CENEf. 2000. (In Russian).
[5] A. Illarionov. Do we need to raise tariffs? "Vedomosti". 24.01.2002, see also "Vestnik TEC". 1.2002. p. 10.
[6] G. Kutovoi. There is no need to raise tariffs. "Vedomosti". 10.04.2002.

To change the situation, Russia decided to follow the experience of many countries reforming the ESI. After long discussions, major directions of reform were formulated in the Government Order № 526 dated 11.07.2001 *"On major directions of reforming power industry of the Russian Federation"*. The major reform driver worldwide is the intention to reduce costs, increase productivity, inspire better investment decisions, reduce excess capacity or mobilize sufficient capital to meet boosting power demand, increase electricity access, reduce unemployment, while meeting other environmental protection and social goals through competition[7]. It is clear that competition is a more adequate tool in addressing cost reduction goals. In the above Government Order, several reasons for power sector reforms are identified: growing electricity intensity, lack of investments in the power sector; low economic productivity in "some" sectors of power industry. ESI advocates argue, that continuation of such situation will lead to the slowdown of future economic growth. No cost or price reduction, or environmental or social goals are mentioned. A strategic reform goal was formulated as follows: transition to sustainable ESI development through modern technologies and market forces to provide reliable and economically productive electricity- and heat supply to meet effective demand in short- and long-term perspective.

Possible models, courses and consequences of the reform were poorly researched. The IBRD provided a $70 million loan in 1997 for R&D to develop a concept and mechanisms of the power sector reform. In January 2002, it was supplemented by an EBRD EUR 100 million loan for enlarging working capital stock, substations upgrade, and development of an effective communication system. Therefore, a sufficient amount of funds and time was available for reform designers. However, the models, courses, and consequences of the reform were poorly researched, and even course and effects of urgent actions to be implemented in summer 2002 were not yet clear to the major players in mid-May 2002. Only in 2002, RAO EES Rossii decided to research possible ESI economics with the assumption that internal gas prices will go up and reach $40 per 1000 m^3. There were no studies of the costs and benefits of the reform comparative to the business-as-usual case, or comparative studies of costs and benefits for different reform models. Only parties interested in getting or keeping control over the industry and gaining additional preferences were involved in discussions. Was it possible to have such simulation studies? The answer is yes. In late 2001, CENEf developed a study of reforming Sakhalin power sector, which is isolated from the EES Rossii, where several reforming models were tested on the background of BAU, and a sensitivity analysis of the reforms outcomes to the evolution of fuel prices, fuel mixes, role of independent producers, application of new technologies and other factors, was conducted[8].

Electricity sector restructuring in Russia is a mismatch of goals and strategies. Declared introduction of competition in the course of reform is in conflict to real, but hidden, economic goals of ESI. The ESI arguments are: much more power will be needed for expected economic growth in Russia (not a very well proved thesis in a country, where the potential to improve the efficiency of electricity use is estimated by the Ministry of Energy equal to 25%). To provide more power, ESI will need more investments (again, an ill-proved thesis in a country with excess capacity over 35 GW). To make such investments more attractive and economically feasible, ESI needs higher tariffs.

Regulatory framework in place is perfect indeed for achieving both price and investment growth goals. Incorporation of a sufficient investment component in tariffs would solve the problem. There is no need to reform an industry to achieve the investment mobilization goal. Especially there is no need in bringing market forces and competition to ESI.

[7] See Competition in Electricity Markets. OECD/IEA. 2001 and N. Wamukonya. Power Sector Reform in Developing Countries: Mismatched Agendas. Risoe National Laboratory. Denmark. 2002.

[8] Program to improve energy efficiency in Sakhalin oblast power sector in 2002-2015. CENEf. Moscow. 2001. (Unpublished, in Russian).

Introduction of competition produces opposite results: reduction of costs and prices and reduction of willingness to overinvest. In the ESI opinion, the system in place has one weak point: substantial pricing power of regional energy commissions influenced by regional administrations. This weak point can be fixed by transferring this pricing power back to the center or to the wholesale market. Many governors are concerned about loosing their influence on the ESI economic policy, about their regional budget tax base, which are important for regional economic and social policies, and so they are in opposition to reforms. Some others do support the reforms, but sometimes restructuring electricity debts for communal or agricultural sectors is the price for their support.

Introduction of competition is not in line with the very capital intense "Russian Energy Strategy". The government faces a dilemma. On the one hand, President Putin demanded higher rates of economic growth. For the sake of sufficient electricity supply to spoor economic growth today electricity tariffs escalation must be limited. On the other hand, large-scale investments are needed to ensure sufficient electricity supply to energy inefficient economy in the coming years, so some price growth is required[9]. And even more so, because for non-economic reasons[10], in its "Energy Strategy" Russia has selected a switch to coal and nuclear power, which are both very capital intensive and scale of production dependant. Introduction of competition can bring lower costs due to higher loads of effective power plants, replacement of obsolete technologies and better managerial practices, as well as growth of natural gas consumption by small modern competitive gas firing plants.

2. Declining productivity of Russia's power sector

The major achievement of the last two years is elimination of the non-payment problem. In 2000, Russia's power sector reached a high rate of payments (93% in October 2001) and a high rate of cash collection (84% of all payments in October 2001[11] on contract with 35% in 1999). RAO EES Rossii tax debt to the government (about $2 billion) was restructured for 10 years. The payment discipline was reestablished due to several factors: stabilization of real electricity tariffs for several years after they surpassed monopolistic upper limit in 1996[12] (see Fig. 3); and strict policies to limit or cut off those who do not pay in 1999-2002, against the background of high price growth.

The major indicator of power sector productivity – labor productivity – halved in 1990-2000 (see Table 1). In the early 90-es, Russia's power sector was sufficiently productive by world standards. But since then, ESI economic efficiency in this sector, defended from the hardships of competition, substantially deteriorated. By the average salary level, ESI ranked third right after the fuel industry and non-ferrous metallurgy. The number of employees increased by 68% against the background of 19% production decline. RAO EES Rossii alone is the employer for 770 thousand, and serves 17 million of customers, or about 20 customers per employer, which is a pretty low ratio against the background of the developed countries indicator: 100-160 customers per employer. Profitability rate in the power sector declined and reached 13.5%, but was still higher than that in the food or light industries, and as high as in the machinery sector. Unwise CHP heat pricing policy and monopolistic power led to the reduction of power generated at combine cycle and to relevant growth in specific fuel consumption. This indicator also increased due to the revision of accounting methodology. Electricity transmission and distribution losses, as well as own-use to final use ratios, grew up even after 1995 and are now equal to 28%.

[9] Estimated by the "Russian Energy Strategy" investments in the power sector are in the range between $147 and $217 billion.

[10] Moreover, in the "Russian Energy Strategy" fuel mix policy is not a consumer reaction to the pricing policy, but rather pricing policy is to tune to the pre-established fuel mix.

[11] This is an overall trend in Russia. Rate of cash payment by all consumers went up from 51% in January 2000 to 75% in October 2001.

[12] See I. Bashmakov. Energy Efficiency. From Rhetoric To Action. M., CENEf. 2000. (In Russian).

Table 1. General indicators of Russian ESI economic productivity

	Units	1990	1995	1999	2000
Number of enterprises	Units	849	1165	1528	1431
Value of sales	billion rubles	21.4	121	270	375
Electricity generation	10^9 kWh	1082	860	846	878
Employers	persons	545	750	880	913
Labor productivity	persons/1000 квт-ч	0.50	0.87	1.04	1.04
Profitability rate	%	18.4[1]	17.5	13.7	13.5
Electricity losses ratio to final use	%	10.2	13.4	15.9	
Own use ratio to final use	%	9.6	11.2	12.0	
Specific fuel consumption	gce/kWh	312	312	341	341

[1] !991

Source: Russian Statistical Yearbook. 2001. Russian State Statistical Committee. 2001.

Present system proved its limited but real ability to introduce better managerial practices, improve economic productivity and reduce costs. In 2001, RAO EES Rossii declared reduction of production costs by 8.6 billion rubles (42% due to fuel switch, 10% due to specific fuel consumption reduction, 18% due to repair costs reduction, and 4% due to labor costs reduction). In 2002, there is a plan to reduce production costs by additional 9.5 billion rubles. Together it will make 18 billion rubles ($0.6 billion), or the equivalent of 4% reduction of average electricity price. It is not clear, how these savings are accounted for, when requests for price rise are discussed. RAO EES Rossii approved its internal Energy efficiency improvement program and set up its Energy Efficiency Center[13].

RAO EES Rossii has a very large excess generating capacity: 33%. RAO EES Rossii controls 195 GW with the maximum peak load of 130 GW. Reserve capacity of around 30 GW is sufficient to provide required reliability of supply, so 35-40 GW forms excess capacity, which is paid for by consumers[14]. It is about equal to the surplus capacity (40-50 GW)[15] of the EU, which generates three times as much electricity as Russia does. Low own capacity utilization generates another problem: reluctance of RAO EES Rossii to buy power from IPPs.

3. FOREM – centrally regulated wholesale quasi-market

The wholesale Federal Market for Energy and Capacity (FOREM) was established in 1993, and until 2001 its capacity was relatively stable: 266-296 billion kWh per year were traded (see Fig. 4). At this quasi-market with completely regulated prices electricity is traded (better to say allocated) predominantly among vertically integrated regional power companies with a very limited involvement of large industrial customers. Directly, or through RAO EES Rossii, the government controls most of about 140 FOREM agents:

- ⇒ Sellers are RAO EES Rossii power stations and government-owned nuclear power stations (25), as well as regional AO-Energos with excess capacities (13);
- ⇒ Buyers are regional AO-Energos with capacities shortages (53), and limited number of large industrial consumers (1 in 1996, 13 in 1999, and 26 in 2002).

A high hurdle to enter the market, complex and lengthy approval procedures limit the number of final users at the market, who have no opportunity to chouse the supplier, but have to buy from the pool. In September 2000, new rules for consumers to penetrate FOREM

[13] A. Bobylev. Energy saving program in the power generation industry. “Energy Efficiency”, CENEf. Issue 28. 2000. B. Kopets. Center for energy saving of RAO EES Rossii: Main tasks and how to cope with them. “Energy Efficiency”, CENEf. Issue 28. 2000.

[14] G. Kutovoi. There is no need to raise tariffs. “Vedomosti”. 10.04.2002.

[15] R. Madlener and E. Jochem. Impacts of market liberalization on the electricity supply sector: a comparison of the experience in Austria and Germany. 3rd International Symposium “Dichotomies and Challenges”. 19-21 September. Stift Ossiach, Austria.

were introduced[16]. First, an application is to be submitted to REC. No reasons based on which it can be declined are specified. Even if declined by REC, the application still can be submitted to FEC, but REC decision is important for FEC's own decision-making. The application of Kirovskii Zavod (St.-Petersburg) was rejected based on the REC conclusion. In addition, before FEC decision it made, the application goes to RAO EES Rossii for expert review. The minimal annual electricity consumption to enter the market is 100 million kWh and working capacity 16 MW. But there still is no opportunity for buyers to choose the supplier. In 2000, FEC initiated elimination of the application approval by REC[17]. "Rosenergoatom" several times approached the government with a suggestion to supply directly to final users, but RAO EES Rossii, RECs and regional JSC blocked these initiatives even after the government supported them[18].

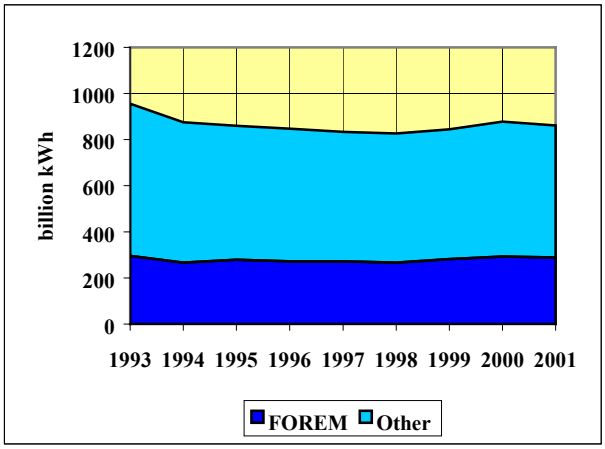

Fig. 4. Role of FOREM in power sales

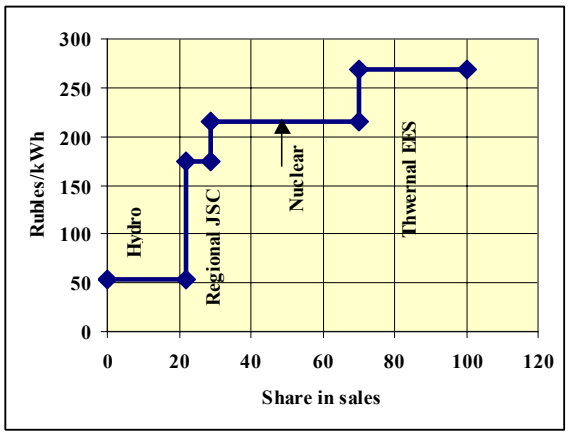

Fig. 5. Purchase prices to wholesale market

FOREM is centrally planned "technical market" with no competition, completely regulated prices, where selection of suppliers is based on the availability of fuel stocks, not on the level of production or marginal costs. FEC sets up pool purchase price separately for all suppliers based on their production costs, which vary widely for different groups of suppliers (see Fig. 4). FEC also sets up unified pool selling price for energy and capacity charge. Hydro power stations and regional AO-Energos with excess capacities supply the cheapest energy, while the most expensive electricity is delivered to the market from thermal RAO EES Rossii power stations. After investment component was included in the price of nuclear energy, it became relatively expensive. Pool selling price is established at the level of weighted average pool purchase price). In 1998-2001, average pool selling price was only once (1999) slightly over average pool purchase price. The so-called "cost imbalance" of 9.3 billion rubles was formed in 2001. It rose from unexpected fuel cost growth, investment component of Rosenergoatom and other factors, while selling price are fixed stable. Since March 1, 2002 average FOREM take off from grid charges went up by 20% and reached: capacity charge 34.2$/kW/year; energy charge 0.9 c/kWh. Time-of-use rates are: night zone – 0.9 c/kWh, half peak – 1.1 c/kWh, and peak zone - 2 c/kWh.

FOREM does not improve overall efficiency of the Russian power industry. Large thermal power stations owned by RAO EES Rossii are cross-subsidized by hydro-power stations and regional AO-Energos supplying FOREM; electricity from FOREM is overpriced. Nuclear power dominates the wholesale market (41%) and nuclear power stations are loaded at 70% of capacity. Hydro-power stations (22% of market) are underloaded. Capacities of regional

[16] P. Synyutin. To the question on urgency of procedure to allow consumers access to wholesale market liberalization. Vestnic FEC Rossii. № 1-3, 2001. p. 21.
[17] A. Karpyuk. Presentation at "Reforming Electricity Supply Industry in Russia. Enterprises in competitive electricity supply market". May 15, 2002. Moscow.
[18] Yu. Koryakin. Deregulation – revolutionary process in power sector. "Vestnic FEC Rossii". № 1-3, 2001. p. 37-41.

AO Energos (7%) are loaded by 50%. The rest 30% are supplied to the wholesale market by thermal power stations owned by RAO EES Rossii, which are loaded only by 39%, and many of them like Gusinoozerskaya and Novocherkasskaya power stations are loaded as low as 30% in peak. All non-variable costs of these and other poorly loaded power stations are included in the FOREM capacity charge. Phasing them out via conservation and decommissioning of excessive capacities would substantially reduce capacity charge and average tariff from FOREM, as well as address the "cost imbalance" problem. FEC proposed the mechanism according to which non-variable costs would be accounted for only in proportion equal to average annual capacity load factor. When implemented, this scheme will allow for 22-30% reduction of FOREM tariffs. Another side to this coin is substantial reduction of competitive advantages of such poorly loaded units at free market by the provision, which prohibit writing off all fixed costs to regulate the market.

Real efficiency of wholesale market, significant productivity gains of ESI, cost reductions are possible with the liberalization of the wholesale power market. As western experience shows, in systems with large excessive capacities instant opening of electricity markets leads to significant cost reduction via tightening competitive pricing to short-term marginal cost for initial four–five years. Only then prices tend to be based on long-term marginal costs. Russia's power sector intends to escape this first stage and jump directly to the second one.

4. Creating new market structure. How open is the proposed "open market"?

Restructuring process was launched in 2001. Restructuring comes by seasonal waves: winter for preparation of the following steps, summer for actions. In the 2001-2002 winter heating season, there were no intensive activities to escape reforming related failures, and since April 2002 reforming activities intensified. Regional AO-Energos restructuring is conducted based on projects developed in line with RAO EES Rossii guidelines. There are two basic scenarios recommended. First, the so-called "minimal" scenario suggests only network assets unbundling with separation of transmission lines, which are to be transferred to RAO EES Rossii. Second, "maximum" scenario suggests forming separate generating, distribution and selling companies. Those guidelines require risks assessments of negative project influence on the social and political situation in the region and on the environment[19].

10 United Generating Companies (UGC) will be created. 48 RAO EES Rossii power stations are restructured in 10 so-called United Generating Companies. Four of them are composed just of hydro-power stations, and another six - of thermal power stations.

[19] These aspects are considered as limitations, not goals of the reform. See Guidelines on preparation of AO-Energo reform proposals. RAO EES Rossii. 21.11.2001.

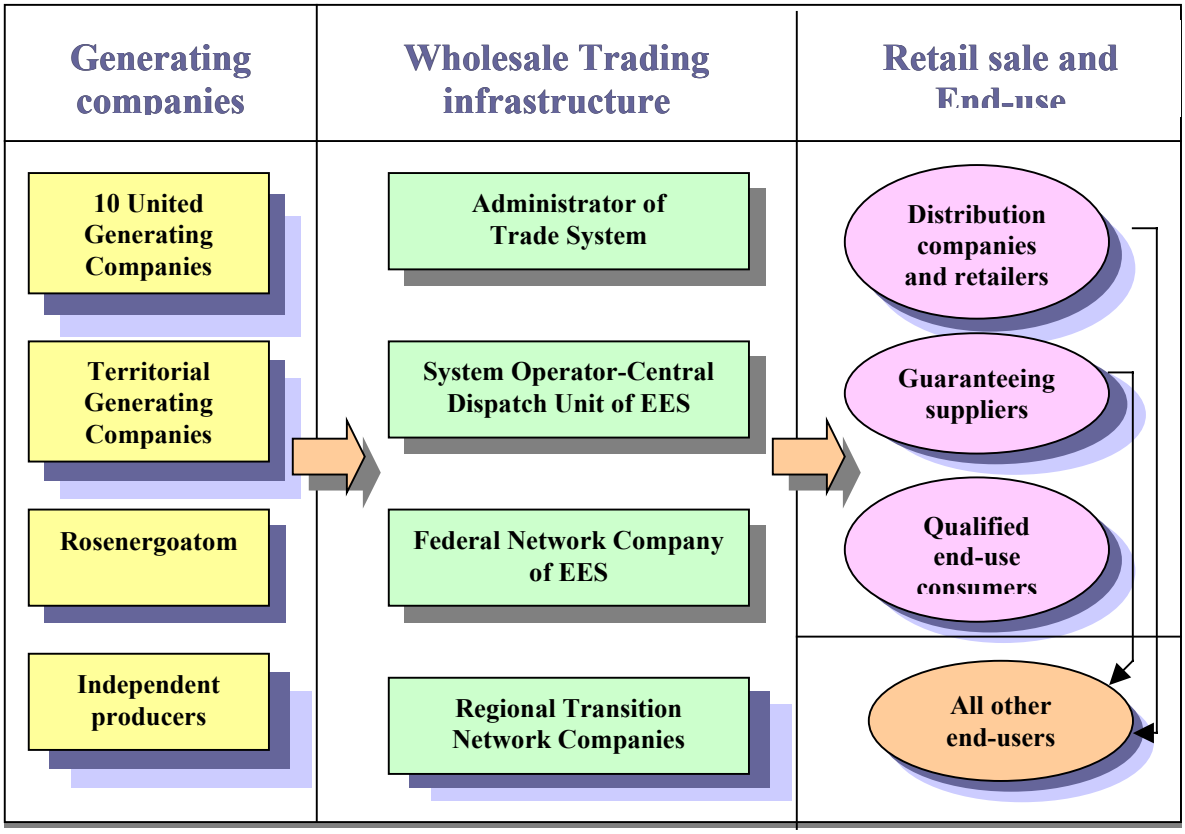

Figure 6. New structure of Russian power sector[20]

Territorial Generating Companies (TGC) are formed from generation sources, owned by regional AO-Energos, including CHPs. All generators are unbundled. Generating companies can form associations, which are to become separate legal bodies. The first TGC was created on May 14, 2002, by restructuring four regional vertically integrated companies in Tula, Orel, Kaluga, and Briansk oblasts into one generation company, two transmission companies and four distribution companies. There is also a possibility to form managing companies to manage several regional AO-Energos. One was created in 2001 on the basis of "Samaraenergo", "Saratovenergo", "Kalmenergo" and "Ulyanovskenergo".

The role of IPPs in supplying electricity to the wholesale market is not clearly defined. According the Government Order, IPPs can sell all generated electricity to the wholesale market. In 2001, all nuclear power stations were associated in new "Rosenergoatom" company. In addition, there are two regional companies not associated with RAO EES Rossii – Irkutskenergo and Tatenergo - which are also considered as independent producers. There is an intensive process of building independent power plants by industries. The logic is simple: generation costs in retail tariff are about 50%, another 15% of AO-Energos costs, and 35% of payments for transmission and distribution. So own IPP cuts the costs substantially, and those IPPs are paying back in 3-4 years. But today such IPPs are discriminated in the network access.

Distribution Companies (Discos) and Retail companies are created. The suggested strategy is merging separated Discos with distribution system owned by municipalities and enterprises.

[20] Based on V. Dorofeev. RAO EES Rossii, Basics of electricity wholesale market model. Presentation at "Reforming Electricity Supply Industry in Russia. Enterprises in competitive electricity supply market". May 15, 2002. Moscow.

The reform is based on fully unbundled transmission companies. "Federal network company of EES" (FNC) created in January 2002 by RAO as 100% daughter company will finally integrate all RAO EES Rossii and AO-Energos transmission networks. Transmission lines and assets, which are controlled by AO-Energos, are transferred first to Regional transmission network companies and then to Federal network company. So the coverage of the FNC transmission system will be larger than present coverage of RAO EES Rossii. It will be fully controlled by RAO EES Rossii and indirectly by the government. The possibility to build private transmission networks is left, but the terms remain to be determined by appropriate legislation and regulation.

"System operator - central dispatch unit of EES Rossii was also established as 100% EES Rossii daughter company. System operator was created on the basis of Unified Dispatch Center in February 2002. Presently, intensive preparation of both "Federal network company of EES" and "System operator-central dispatch unit of EES" to work in the market conditions is under way.

Founded in late 2001 non-commercial partnership "Administrator of trade system" (ATS) is the most contradictory element of emerging trading infrastructure of the wholesale market. It is expected that in summer 2002 ATS will start trading on the free section of wholesale market. RAO EES Rossii controls 50% of votes with the rest controlled by consumers. Determined by the Government Order responsibilities of the ATS are: organization of trade at both regulated and free segments of the wholesale market; creation of contract and payment collection system; guaranteeing non-discrimination of market agents; control of the system operator actions. Not all of the 28 founders of ATS are FOREM agents. Many influential industrial groups-ATS founders were looking for privileges. Government Order № 526 dated 11.07.2001 *"On major directions of reforming power industry of the Russian Federation"* states, that ATS can be formed only by FOREM agents. So there is a legal contradiction and AST in its present form is not legitimate. However, in this status it negotiated with the government rules and procedures for wholesale market operation.

Three years of 5-15% mystery: it is not clear yet, how much electricity initially will be traded on the free market[21]**.** Initially, for 2002-2004, only 5-15% of electricity of every associated with RAO EES Rossii FOREM supplier can be traded on the free section of the wholesale market. There are several questions. First, why not the minimal supply to regulated market, but percentage of generation is defined? It would be more reasonable to establish minimal required supply from each supplier to the regulated market with the rest potential generation freely traded at marginal costs. Second, 5-15% of which exactly generation: last year, this year projection, full-load generation, or what? Third, should free market buy equal portions - 5-15% - from every FOREM supplier, whatever his marginal costs, or can it buy from the most efficient suppliers first? Independent suppliers are eligible to supply all generated power to the free section of the market. So who are they? Is Rosenergoatom counted as an independent producer? If so, it will control 80% of the "free" market. It is not clear, if other independent suppliers, like Irkuskenergo and Tatenergo, can trade all excess electricity at the free market. Finally, it is not clear, how this percentage will be established for new Territorial Generating Companies. It is not also clear, how 5-15% should be counted, and from what amount: supplied to FOREM or generated. The rules are to be established by the government in June 2002.

It is not clear, whether from the very beginning buyers will eagerly buy from the "free" segment of the market. A possibility to place hourly price-quantity requests at the free segment of the wholesale market is disputed. This dispute is rooted in the expectation that free market prices will jump up. So not many buyers will be willing to buy from this market. Proposed alternative is as follows: buyer gets requested power, and only post-factum delivered amount

[21] Author addressed this question to top managers of RAO EES Rossii V. Dorofeeev and ATS A. Gan, and they fail to give clear answer.

will be split in two: purchased at regulated prices and at market prices. So customer will be forced to get power from the "free" market, whatever the market price. That is a very strange "free" market, where customer is buying without knowing the price.

It is not clear, whether direct contracts will be allowed and should they be limited to 5-15% of demand and supply. Most players agree with such suggestion, but dispute the possibility for some market agents. All these issues are to be addressed by the government no later than June 2002.

5. Regulatory policies: more central control leaves no room for competition

5.1.1. New pricing policy documents contradict the Russian Federation Constitution

Two major recent documents really highlighting present status and chosen directions for pricing policies were approved by the Government Decree №226, dated April 2, 2002: *"Basics of electricity and district heat pricing in the Russian Federation"* and *"Rules of state regulation and application of electricity and heat tariffs in the Russian Federation*". First, it should be stated that there were no public discussions of both documents. RAO EES Rossii and Ministry of economic development developed them and got a lot of criticism from the Federal Energy Commission. Many mechanisms are specified under condition that they do not contradict the legislation in force. But they do contradict even the Russian Constitution, the Law *"On the government regulation of electricity and heat tariffs in the Russian Federation"* and several others pieces of legislation. So many of these mechanisms are not legitimate. The federal government already approved a package of 6 laws including one *"On the tariffs regulation",* and passed this package to the State Duma for approval. Alternative versions of this law were submitted as well. The barrier of Constitution can block the government draft law. Nonetheless, two documents referenced above are official documents, which mirror the present government electricity pricing policy. The *"Basics of electricity and district heat pricing in the Russian Federation"* fixes:

⇒ The system of prices and tariffs for the reforming period;

⇒ Sources for investments in the power sector;

⇒ Price setting methods and procedures.

5.1.2. Price system

Proposed price system is becoming more complex with unbundling of some activities and internalization of some new costs associated with the creation of a new market structure. Such new components are: price cap for the free sector of the wholesale market; price for transmission by national and regional networks; price for system reliability; charge for providing nuclear power stations safety; charge for balancing services; charge for system operator services. The whole system consists of:

Tariffs and prices regulated by the Federal Energy Commission:

⇒ Capacity charge and energy charge for suppliers to the regulated wholesale market sector;

⇒ Capacity and energy charges for buyers at regulated wholesale market sector;

⇒ Price cap for the free sector of the wholesale market;

⇒ Price for transmission by national and regional grids;

⇒ Grid access charge;

⇒ Charge for the system reliability;

- ⇒ Charge for guaranteeing the safety of nuclear power stations;
- ⇒ Charge for balancing services;
- ⇒ Charge for system operator services;
- ⇒ Price for heat generated by companies supplying electricity from CHPs to the wholesale market;
- ⇒ Price for electricity not supplied to the wholesale market;
- ⇒ Subscription fee for the development of EES Rossii transmission grid;

Tariffs and prices regulated by the Regional Energy Commissions:

- ⇒ Prices for heat and electricity for final users;

Price set up by market forces:

- ⇒ Equilibrium price at the free wholesale market sector.

Price setting process is becoming more centralized with much higher inertia. It is literally stated that jurisdiction for setting prices for electricity generated at all sources, as well as for heat generated by CHPs, supplying to the wholesale market is moving from Regional Energy Commissions to the Federal Energy Commission (namely, this provision contradicts many existing laws). In addition, the basic pricing period is one year (used to be one quarter) with a number of conditions for earlier tariffs adjusting applications. Production costs do depend substantially on the capacity load. "The rules…" stipulated, that producer could apply for adjusting price when the gap between actual and regulated production is over 5%. So generators will apply for adjustment only when real production is 5% lower than the planed levels and newer when it is 5% higher and correspondingly production costs are lower. With such system incentive is to have lower planned volumes and high costs, but to sell more and benefit from the cost reduction.

Like former Soviet State Pricing Committee, FEC will exercise full price control. FEC will directly set all prices for electricity generation and indirectly all prices for heat generation from CHPs. Prices for heat for those CHPs working on the wholesale market will be set up by FEC. If they are set high, to keep electricity competitive, CHP will continue losing local heat markets. If they set low, CHPs will lose competition at the power market. If electricity prices for all CHPs are set by FEC, it automatically indirectly determines heat tariffs. RECs will have nothing more to do, but just deduct required electricity revenues from CHPs collections and share them with co-generated heat.

Price for all IPP electricity also is falling under centralized FEC control. Ability of industrial IPPs to provide power to the grid to a large degree depends on the overall market situation and capacity loads. They can hardly be within 5% precision limit. So in many instances it would be very difficult to identify, how much electricity can be sold to the grid for a year ahead.

Until the free section of the market is large and trade rules are transparent and reasonable, there is no room for competition, and the pressure of market forces for costs reduction is very weak. It is not clear, how much room new pricing system leaves for competition. Only 5-15% of electricity is to be traded initially at the open market. In the market framework with large excessive capacities, substantial differences in production costs and substantial possibilities for costs reductions, as it is in Russia, prices at correctly tailored free market should be lower than regulated ones. On the contrary, RAO EES Rossii expects price explosion at free market (see Fig. 2, compare with smooth price growth at the regulated market). So government has to establish a price cap. Such outcome is possible only if competition at the "free" market is unworkable and has no power to press prices down, but traders created trade rules allowing for speculative price manipulations, which defend free market position of inefficient suppliers.

A possibility to introduce more competition to heat supply markets and a possibility to price both electricity and CHP's heat on the basis of economic situations on the local power and heat markets, is lost. There is a long discussion on how to set proper prices for heat and electricity generated at CHPs. Unwise heat pricing policy squeezes CHP heat from heat markets (high prices press demand down and supply from independent boilers up) and makes CHP less competitive both at heat and electricity markets. Many Russian experts proposed approaches with flexible costs allocations between heat and electricity to maximize overall economic and energy efficiency of CHPs[22]. They are to be flexible for seasons, climate conditions and many other factors. This allocation is to take into consideration market situation at power and local heat markets. Conditions on all local heat markets cannot be fully controlled form the center.

The right of the final user to choose supplier is a fundamental pressure on the supplier to reduce costs, but this is not specified. Very weak and unclear provision is given on a possibility for direct contracts between suppliers and producers.

5.1.3. Pricing principles

The main principle is compensation of "economically justifiable costs". Competition decides, what costs are "economically justifiable". But with a substantial degree of central control over the market this function will be performed mainly by FEC. After decades of central planning in Russia there is no reason to believe it will work.

Not competition, but government through pricing policy is to safeguard sufficient investments. Investment price component will be included in profit margin. So profits are to be guaranteed and set up sufficiently high. Transition from the system in which RECs set up prices for electricity overcoming resistance of local regulators and political leaders to have large investment components, to a new system, where FEC is setting up prices with guaranteed investment component, gives much more hope to ESI for rising investments, then competition. This system has no internal mechanisms preventing from overinvesting. Each regulated market agent is to submit its investment plan to be approved by the regulating body. For new power stations, FEC is setting prices at the level with given profitability. This means those sources are not entering competition section of the market and supply exclusively to regulated market. Prices will be set up with profitability sufficient to pay back invested capital.

Retail electricity and heat prices will be set up by RECs based on average electricity acquired from wholesale market, from local producers, and other suppliers. So if FEC sets up prices for all generating and network companies, the role of RECs is just to develop tariffs menus consisting of three entrees (single tariff scheme, capacity charge and energy tariff scheme, and time-of-the-day tariff scheme). So the end-user is free to choose from this menu. Another innovation is mandatory separate specification in the electricity bills of all major electricity cost components.

There is one cost reduction provision. If a project generates costs reduction, the level of specific consumption used in the planning process is to stay as long as the payback period plus 2 years. No limits on the duration of payback are given. No requirements are specified to the procedures of recalculation of these specific coefficients later. No competition press for cost reduction is expected. This provision is only applicable to the regulated segment of power market.

Price setting process is becoming less vulnerable to the political influence at the regional level, but more so at the federal level. Political considerations were responsible for what is perceived by power companies as inadequate price adjusting to growing production costs. So power of regional administration will be diminished, while the federal government will be capable to exercise such political power. So real independence of FEC is crucial, but

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mechanisms to enforce the independence were not proposed. Importantly, reference to the political influence is often just an excuse for regional AO-Energos to escape justification and scrutiny of proposed costs before experts well familiar with the local conditions of the industry[23].

The tariff setting process is escaping the public control. Regulation proposes a possibility for the public to participate in hearings (one unclear paragraph). But those hearings will take place in Moscow, so local and regional public interest groups will not be able to participate in the discussions. Many Russian experts complain, that RAO EES Rossii is a legislative body for itself[24]. In other words, it is strong enough to gain government, FEC and State Duma support and push through any desired regulation and legislation.

6. Decade of restructuring

Restructuring of the Russian power sector will take 8-10 years, and will be done in three stages. The first stage will last 3 years. Up to the end of 2004, regulatory framework for the new ESI structure is to be formed; the present structure of ESI is to be changed, and mechanisms to trade electricity at free wholesale market are to be tuned. All pricing tools are to be tested and polished. At this stage regulation of independent suppliers is to be stopped, more agents are to penetrate the wholesale market.

At the second stage – 2-3 more years- all electricity at the wholesale market will be traded freely. Only prices for transmission and dispatching services will be left regulated. The process of independent retailers and brokers will be finalized, as well as a regulatory basis for the restructuring.

At the third stage – 3-4 more years – restructured electricity supply industry is to confirm its ability to raise sufficient capital resources for its further development in the framework of the new structure.

7. Costs and benefits of restructuring

7.1. Russian power sector is so powerful, that there is a fear that reform will be conducted in the interests of ESI, which are different from country interests

ESI is seeking contradictory restructuring benefits: less control by the regional governments, less federal government control, doubling revenues and higher investments at the expense of the rest of the society. Substantial re-distribution of wealth from industry and other sectors is expected. This process is already launched: buyers at FOREM, i.e. the majority of end-use consumers, are paying FOREM price, which includes investment component to finance nuclear power development. So investments are deducted from the industry, where they generate more value added per additional unit of fixed capital, and economic growth is slowing down. In addition, 2002 federal government allocated $0.5 billion for the development of the power sector capacities and networks[25].

Declared introduction of competition in the power sector with substantial excess capacity and large room for productivity improvements, if wisely implemented, should bring opposite to expected by RAO EES Rossii results: cost and investments rationalization and reduction. Real ESI hopes can be met more effectively by modifications of existing regulatory system. Only intentional tailoring of free section of the wholesale market can bring price growth at the first stage of reform to convince regulators to raise prices at the regulated market. Electricity price impact of expected fuel costs growth can be neutralized by competition. As study conducted by CENEf for Sakhalin shows, that even when gas prices are growing up to $40

[23] V. Novikov. Willing to have more money is not a basis for increasing tariffs. “Vedomosty of Sankt-Peterburg”. August 30, 2000.
[24] Yu. Koryakin. Deregulation is the revolutionary process in the power sector. “Vestnik FEC Rossii”. № 1-3, 2001. p. 37-41.
[25] Vestnik TEC. 1.2002.c. 39.

per 1000 m^3, correctly chosen restructuring strategy keeps prices from growing and is capable to reduce them[26]. In Germany in 1998-1Q 2001, wholesale gas prices went up by 65%, fuel oil prices by 34%, coal prices by 8%, but wholesale electricity prices went down by 16%[27]. That is a real result of competition! Other results in Germany are: phasing out power plants in 2000 by 10GW and plans for phasing out 2 GW more of nuclear power plants; halving producer generating price within three years to the level 1.5 cEUR/kWh at the power exchange (or about to the level of Russian electricity supplied by thermal power stations to FOREM); declined by 25% employment in the power sector; 20% decline in co-generated electricity which required later the CHP electricity support bonus introduction equal to 1.5 cEUR/kWh[28].

Watch my lips – reforms are to reduce costs, eliminate unproductive expenditures and inspire well-justified investment programs. In the Annual Message to the Federal Assembly president V. Putin[29] noted:

- ⇒ Reforms are to reduce costs, eliminate unproductive expenditures and inspire well justified investment programs[30];
- ⇒ Monopolies' requests for prices escalation with the argument of production costs growth are often not justified;
- ⇒ Reforming infrastructure monopolies, including power sector, are to be conducted in the interests of the country. Consumers, municipalities and state should not suffer in the process of those giants' modernization;
- ⇒ The Government has to approve the budget of infrastructure monopolies.

This statement gives a perception of significant information asymmetry between the government, regulators, and ESI. At least at the initial stages the government control of both production costs and investment decisions is considered as a solution for balancing course of power sector reform with other development goals and interests, including social and environmental ones.

No reform is needed to double electricity tariffs as a responce to expected quadrupling of gas price. Management of RAO EES Rossii is seeking for doubling electricity tariffs by the end of 2004[31]. This is a very simple math. Gas price is expected to go up by 400%, therefore, with the fuel cost lower than 30% of the final electricity price and natural gas share in the fuel mix of 40%, the resulting electricity tariffs will go up by 50%. This is a trivial logic of the present regulatory system: no reform is needed to get this result. The Ministry of Economic Development sets up limits for annual electricity tariffs growth. Projection for 2002-2004 is 15-18% per year. This will hardly promote fulfillment of the wish of RAO EES Rossii to get double prices by the end of 2004. On the graphs used by RAO EES Rossii in their presentations[32], regulated price goes up smoothly, but introduction of competition doubles the prices immediately, and only then it drives prices down with a very high additional redistribution of

[26] Program to improve energy efficiency in Sakhalin oblast power sector in 2002-2015. CENEf. Moscow. 2001. (Unpublished, in Russian).
[27] Energy Prices and Taxes. Quarterly statistics. Second Quarter. 2001. IEA. 2001. p.144.
[28] R. Madlener and E. Jochem. Impacts of market liberalization on the electricity supply sector: a comparison of the experience in Austria and Germany. 3rd International Symposium "Dichotomies and Challenges". 19-21 September. Stift Ossiach, Austria.
[29] V. Putin. Russia needs to be powerful and competitive. Annual Message to the Federal Assembly. "Rossiskaya Gaseta". 19.4.2002.
[30] To be noted that such goals were not specified in the Government Order № 526 dated 11.07.2001 *"On major directions of reforming power industry of the Russian Federation"*.
[31] Energy industry of Chubais. Rossiskaya gaseta. 24.04.2002. p. 4.
[32] To my question Deputy Chairman of RAO EES Rossii V. Sinyutin replied, that there are two vectors driving prices. One drives them up (forces were not clearly specified, but mainly are related to fuel prices) and competition driving them down. Conclusion from such reply is as follows: room for market forces in five initial years is too weak to neutralize the desire of RAO EES Rossii to have higher prices. Discussion at "Reforming Electricity Supply Industry in Russia. Enterprises in competitive electricity supply market". May 15, 2002.

wealth to ESI from the rest of economy in the first five years (see Fig. 7). Competitive markets work differently!

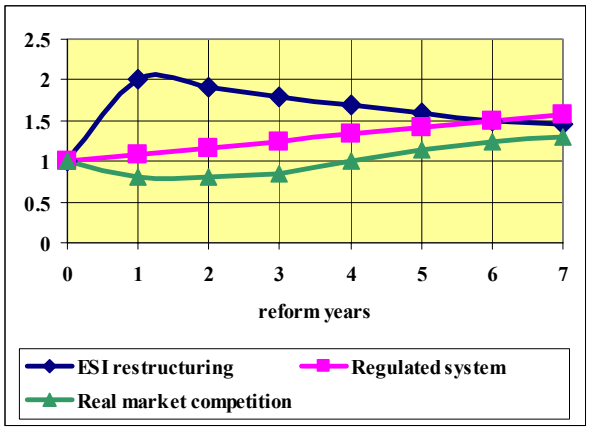

Fig. 7. Possible price evolution under different structures of ESI market[33].

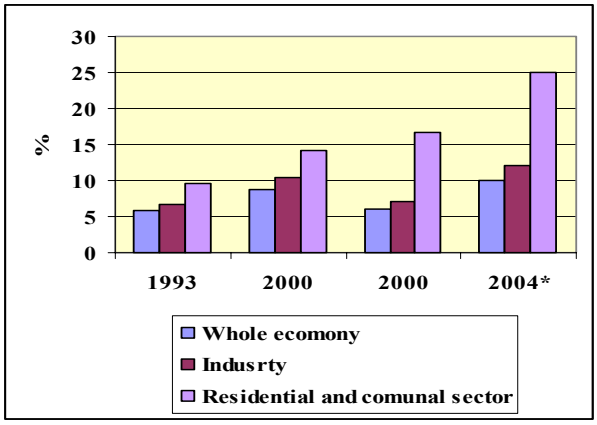

Fig. 8. Electricity and heat costs shares in the overall costs (2004* – estimate for doubling electricity and heat prices)

7.2. Sharp doubling of electricity price brakes economic growth

Practical implementation of proposed power sector investment program will slow down short-term and long-term economic growth. Power sector leaders agree, that Russia's power sector has all possibilities to supply sufficient amount of energy to support economic growth. But in some years, when annual economic growth rates may reach 7-8%, it will face power capacities shortages. So there is a need to invest in new capacities[34]. Total investments in Russia's power sector, according to the "Russian Energy Strategy", in 2001-2020 are estimated in the range of $150-250 billion: for 2001-2005 - 18-19; for 2006-2010 – 25-42; for 2011-2015 – 44-69; for 2016-2020 – 61-87. Russian GDP in 2000 was estimated slightly over $1,000 billion[35]. So Russia's power sector demands for 2% of GDP annually for investments, or 20% of the whole economy investment budget. That is a double of the worldwide practice. It is indeed a very heavy investment burden on the Russian economy. Doubling of the final consumer price can generate $18 billion. Such program can be realized only at expense of the rest of the society and so at the cost of slower economic growth. To have sufficient electricity supply to spoor economic growth today, electricity tariffs escalation is to be limited.

Industry and communal sector will suffer most from abrupt doubling of electricity prices. It will further escalate the role of energy costs in the overall costs (see Fig.8). Even petroleum industry, consuming 45 billion kWh annually, is concerned with the possible price growth impact both on the production cost and demand for petroleum product, which is related to economic growth. M. Kchodorkovsky, Head of YuKOS oil company, commented that the decision to increase prices by monopolists by 20% in the beginning of 2002 will bring rates of GDP growth down by 0.2% in 2002. When oil prices are coming down, they (ESI) are to cut costs, not to increase prices[36]. So doubling prices will slow down economic growth by 1-2% per year. The stricter the sanctions for non-payments, the lower the rates of economic growth, as

[33] V. Dorofeev. RAO EES Rossii, Basics of electricity wholesale market model. Presentation at "Reforming Electricity Supply Industry in Russia. Enterprises in competitive electricity supply market". May 15, 2002. Moscow.
[34] Energy industry of Chubais. Rossiskaya gaseta. 24.04.2002. p. 4.
[35] Russian Statistical Yearbook. 2001. Russian State Statistical Committee. 2001.

[36] Vestnik TEC. 1.2002. p. 9.

well as power sector revenues collections, keeping in mind that price elasticity of demand is not less than –0,2.

7.3. Power for people or people for power?

Power industry restructuring will transform the responsibility for fuel supply to power stations from joint responsibility of RAO EES Rossii, regional AO-Energos and regional administrations to just separate generating companies. There is a fear that generation companies, which are last in line for cash end-users cash payments can fail to have adequate fuel stocks for the heating seasons. Overall responsibility for fuel supply will be delegated to the Ministry of Energy and regional governments[37]. It is not clear, how effectively the Ministry will be able to solve fuel supply problems.

Doubling the electricity price in the residential sector will reduce average salary electricity purchasing power of increase this indicator gap between Russia and western world to 1:25. Electricity prices for residents in Russia are often referred to as very low. With an average monthly salary in Russia today one can buy as much as 4,000-5,000 kWh. With a doubled price, this number will go down to 2,000-2,500 kWh. In developed countries this number is 35,000-60,000. Keeping in mind a very high portion of food (50%) in consumption pattern and growing communal and housing costs associated with the housing reform, it is very clear that electricity tariffs growth is going to be very painful for low-income families (30% of Russian population have incomes below the living wage). In 2001, electricity, heat, water and fuel costs in the average family budget were equal to about 6%, or as much as spending on milk and dairy products. So additional electricity price growth will force poor families to cut their food consumption.

RAO EES Rossii is proposing creation of Social Consumers Support Fund to smooth expected price blow and neutralize possible underconsumption of electricity by low-income families (less than 90 kWh per person per month). To fill this Fund it was proposed to establish a special fee at the wholesale market and accumulate corresponding funds to be used for social support to low-income families. This fund will exist 4 years. So RAO envisages the final outcome of reform in sharply growing prices and proposes introduction of a new system of cross-subsidies.

RAO EES Rossii is seeking for industrial consumers' support in the implementation of reforms, arguing that the new system will eliminate cross-subsidies, but in reality proposes to introduce new larger-scale cross-subsidies. On the one hand, presently cross-subsidies burden is becoming much smaller. On the other, keeping in mind that industry and transport consumes 60% of electricity they will be mainly loaded by a new proposed cross-subsidization scheme.

Restructuring process and sharp electricity prices will raise problems with federal, regional and municipal budgets. Restructuring with more access to the wholesale market would lead to the regional redistribution of tax base. It is a strong argument of regional administration to prevent large industrial consumers from purchasing power from FOREM. Taxes will be paid to the regional budget where electricity was purchased. In Togliatti in April 2002, tariffs increased overnight by 44%. This raised a high concern of municipalities located in Samara oblast[38]. Such additional expenditures were not accounted for in the approved budgets. Ministry of education alone pays more than $50 million only for electricity consumed by universities. Doubling of this budget line is possible only at the expense of professors' salaries.

Experience in privatization and restructuring of power industry in Ukraine, Kazakhstan and Georgia is considered as negative. It was summarized by the following way: substantial

[37] A.B. Kusovkin. RAO EES Rossii project to split Russia's power industry. Vestnik FEC Rossii. № 1-3, 2001. p. 29-32.
[38] Rossiskaya Gaseta. 23.04.2002. p.3.

under pricing of privatized assets; distribution of benefits in favor of intermediate agents, not generation companies; electricity price growth against the background of low reliability; underinvestments by foreign companies in the modernization of physical plants and networks and corresponding growth of electricity and district heat losses. In Armenia, the WB's condition for providing a $45 million loan to cover 50% of the state budget was privatization of the power industry[39]. It alerts the Russian society.

7.4. Environmental repercussions of restructuring

"Russian Energy Strategy" suggests, that reforming of the power sector will be accompanied by a substantial pollution growth and it is more concerned with the safety of growing nuclear power generation. There are only five pages in the "Russian Energy Strategy" dealing with environmental aspects of future energy options. Environmental considerations are not even considered as limits to development. Emissions are calculated for scenarios selected based on other considerations. So a natural result of the proposed fuel switch is in favor of coal. The share of coal in the fuel mix is projected to rise in 2000-2020 from 15 to 29% at the expense of natural gas (decline from 42 to 34%). So orientation to coal naturally leads to the substantial emissions growth in 2000-2020 (see Fig. 9).

Power sector related GHG emissions will go up by 15-37%. After it dropped from 2,326 million t of CO2 in 1990 to 1,610 million t of CO2, it will go up in 2020 to the level of 1,840-2,200 million t of CO2.

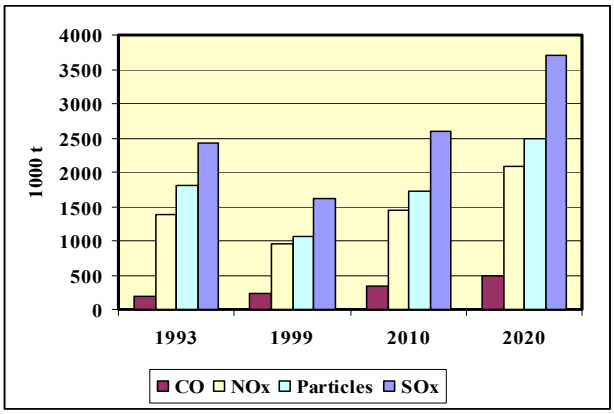

Fig. 9. Emissions from Russia's power sector

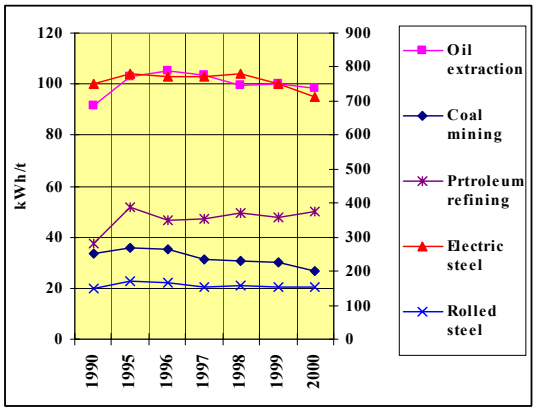

Fig. 10. Specific electricity consumption for major industrial products

7.5. Power reform and energy efficiency

One of the major arguments of ESI advocates is that growing electricity prices would lead to energy efficiency improvements. That is true when prices are growing smoothly and consumers have time to adjust their behavior and are in an appropriate financial shape to mobilize investments for energy efficient technologies and practices application. As experience of 1990-1995 shows, shocking electricity price escalation can lead to growing specific electricity consumption even in industries, which were in a much better economic shape compared to others (see Fig. 10). There are many barriers to energy efficiency in Russia, which the government should address.

Mentality to find solutions to energy problems at the supply side is deeply rooted, and the present Russian government's attitude to energy efficiency is reduced to just verbal support. Recently adopted federal program titled "Energy Efficient Economy" illustrates this perfectly. It was titled "Federal program" with a budget allocation equal to just 0.4% of the total

[39] V. Khorobian. Selling out of power industry enterprises in Armenia is frozen so far. Vestnic FEC Rossii. № 1-3, 2001. p. 118-119.

program costs. It was titled "Energy Efficient Economy" with energy efficiency share in the program costs equal to 3.6%, or ten times less than costs for gas industry and 80% less that nuclear safety support. In residential and communal sector this program suggest to allocate per person per year 2 USc. What can be done with such money even if everyone contributes own 2 US$? Calculations based on data presented in this program shows that efficiency of program allocations in energy efficiency is 10-15 times as much as those in energy supply. There is only one renewable development project – geothermal power station at Kamchatka - for which funds were allocated from federal budget in 2002.

According to Government Decree №226, April 2, 2002, no tariff incentive schemes to support energy efficiency improvements or renewable developments are possible. Price incentives, subsidies and benefits are prohibited when sources for compensation are not identified. So it does force consumers to pay for investment resources in power sector, but block the same source for energy efficiency and renewables. If there are other tariffs investment component sources available, than there is a reason to distribute them directly without using pricing mechanisms.

The fate of CHPs on the emerging competitive market is not clearly specified. In many countries – from Germany to Kazakhstan – reforming of power sector led to generated substantial problems with CHPs. There are different solutions to this problem. But design of reform in Russian power sector gives no answer, which tools would be selected by Russia.

8. Recommendations

The process of power sector restructuring in Russia is in its initial stage, the fruits of restructuring are yet to be seen. Worldwide restructuring experience projected on the specific situation in Russia allows envisaging a bitter taste of many fruits to be harvested. At this initial stage of restructuring there is a chance to fix or adjust designed source of reform. Some of such recommendations are presented below:

1. **Possible models, courses and consequences of the reform are to be carefully researched and openly disputed**. When donors' funds for reform design are realized, they should be allocated exclusively to the power sector, which is to be reformed, and to foreign consultants who are not familiar with the country's specific situation and are often inclined to copy their experience at a given country. Projects for which such funds are allocated should incorporate activities for wide public discussions of proposed reforming models.
2. **The main reform goals should be formulated not in the terms of improving the economic situation for the power sector at the expense of the rest of the society, but to support sustainable development goals**: economic growth, poverty reduction, environmental situation improvement, and account for distributional effects and equity considerations. Selected reforming models, courses and consequences are to be checked for compliance with sustainable development goals, and instruments to handle contradictions are to be identified.
3. **More research on foreign restructuring experience is to be conducted with wide dissemination of research results (in many languages)**. All parties involved in the reforming process often use references to foreign experience as arguments. There are many speculations and manipulations. A very limited group of experts possess a comprehensive picture of the reforming process. This experience is to be publicly and widely available. This will allow for a more socially balanced design of reforming process and avoiding mismatching reforming goals and strategies.
4. **Substantial attention is to be given to setting balanced, coordinated and clear rules for restructuring and operation at the free market**. Regulatory uncertainty and legal contradictions of restructuring regulation make the legal basis for operation in the

industry as a whole and at the free segment of the market particularly non-transparent, and so retain investors and agents from correct decisions.

5. **When competition in the power market is introduced by stages, a clear size of the free market and a definition of eligible agents are to be identified**. Not percentage from each supplier, but minimal supply from each source initially can be regulated, with the rest electricity traded freely.
6. **Consumer choice and direct contracts mechanisms are to be incorporated in the reform design**. Only consumer pressure and active behavior in the market will allow for a cost reduction pressure along the whole electricity generation and supply chain.
7. **The course of the power sector reforming is not to be tuned to priority selected in the Energy Strategy, investment plans and fuel mixes.** Let market forces do the work. In Germany, 1,000 m3 of natural gas to power sector cost about 150 US$ and still investment decisions are made in favor of small gas powered units. Why in Russia with gas price going up to 40 and even 60 US$ government anticipate orientation on coal.
8. **Improvement of energy efficiency and ecological situation are to be considered among major reforming goals.** Policies and measures are to incorporate in the reform model sufficient to accomplish environmental policy goals as well as overall economic efficiency of which energy efficiency is one of the most important components.