RAO UES – The Challenge Ahead

President Putin has signed the necessary legislation and now RAO UES is embarked upon a major restructuring plan. UES is the dominant factor, by far, in the generation, transmission and distribution of electricity in Russia. It is not a monopoly over the whole country, but is a monopoly in most of it. It is a vertically integrated giant that generates and supplies conventionally generated electricity to most of Russia. Power generated in Russia's ten nuclear power stations is also sold over the UES grid. However, the nuclear stations are owned entirely by the Russian government and managed separately.

RAO UES was formed by the Russian government in 1992 to commercialize and partially privatize the national electricity system. UES thinks of itself in three components:

- The Company, which is comprised of the top level management activities;
- The Holding, through which UES controls and partially owns 245 joint stock companies;
- The Group, which is a slightly broader affiliation of activities.

RAO UES is a publicly listed company in which the Russian government maintains 52.55% of the shares of the company, and thus continues to exercise control. RAO UES as an entity operates on a nationwide basis. For most of the generation and distribution of electricity, the assets are owned and operated by "energos," regional companies that generate and distribute electricity in their region. There are 75 energos in Russia, 73 of which are owned wholly or in part by RAO UES:

- 9 are owned 100% by UES
- 52 are owned 49% to 99% by UES
- 11 are owned 20% to 49%
- 1 is owned less that 20% by UES.

Where UES does not own 100%, other owners can be the general public through listing on the Moscow stock exchange and/or some regional authorities.

The divide in Russia between transmission and distribution is power lines at or above 220 kv are considered transmission. The total length of transmission and distribution lines owned by RAO UES and the 73 energos is over 2.6 million kilometers, which is over 96% of all transmission and distribution in Russia.

The Holding has installed capacity of 156,100 megawatts, of which 122,000 is in fossil fueled plants and 34,100 is in hydroelectric plants. The Holding generated 626.8 TWh of electricity in 2001, or about 71% of all electricity generated in Russia. Of that amount, the fossil-fueled plants generated 501.0 TWh.

The power generation assets in the Holding are in two categories: directly owned by the Company (federal level plants) and those owned and operated by the energos. The great majority of the capacity is in the latter category. There are 37 power plants owned directly by RAO UES. There are 10 energos that dominate the structure. As shown in the table below, most of the power generated in the Holding comes from these 10 major energos plus the federal level plants.

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Summary of major generating assets of RAO UES

Year	*1999*	*2000*	*2001*
Electric power generated by major regional energos, GWh			
Chelyabenergo	10,168.5	10,012.1	8,195.3
Khabarovskenergo	7,881.3	8,230.2	8,137.2
Kuzbassenergo	26,938.7	26,599.8	26,438.5
Lenenergo	15,205.8	16,094.6	16,246.9
Mosenergo	64,630.8	68,907.3	71,352.6
Novosibirskenergo	11,310.4	12,296.0	10,760.0
Orenburgenergo	16,704.1	15,919.7	14,496.6
Samaraenergo	14,671.1	14,519.1	13,818.6
Sverdlovenergo	30,811.9	38,846.6	37,664.3
Tyumenenergo	63,462.6	61,871.6	59,597.5
TOTAL for 10 energos	261,785.2	273,297.0	266,707.5
Share of RAO UES total	43.5%	43.9%	42.6%
Electric power generated by federal level thermal plants			
GWh	86,686.6	91,884.4	96,169.7
Share of RAO UES total	14.4%	14.8%	15.3%
TOTAL major energos and federal level thermal plants			
GWh	348,471.8	365,181.4	362,877.2
Share of RAO UES total	57.9%	58.6%	57.9%

Source: RAO UES annual report for 2001

(Note: federal level hydroelectric plants are considerable, about 68 TWh of generation in 2001, but we have not included them as there is some question in our mind whether or not those would be included in any restructuring packages offered to investors or managers.)

Two-thirds of the power generated in thermal power stations is fueled by natural gas. Coal-fired stations are more commonly found east of the Ural Mountains. The table below shows the fuel consumption numbers for three years (percentages calculated for only two).

Fuel Supplies for Holding Company Thermal Stations

	1999	*2000*	*2001*
Coal (mln tonnes)	110.5	120.1	109.6
Fuel oil (mln tonnes)	11.0	8.5	7.6
Natural gas (bln m^3)	125.6	127.1	131.2
share of fossil generation[1]			
Coal		30.1%	27.9%
Fuel oil		5.1%	4.6%
Natural gas		64.4%	67.2%

1. Do not add to 100% due to "other fuels"

Source: RAO UES annual report for 2001

The Restructuring Challenge

As previously mentioned, RAO UES is owner, or part owner, of 245 joint stock companies:

- 100% ownership – 100
- 75% → 100% ownership – 13
- 51% → 75% ownership – 53
- 25% → 51% ownership – 52
- →25% ownership – 27

In short, for 79 companies (32%) RAO UES owns less than a controlling share, and for 132 companies (54%) they may not even have a blocking shareholding. Therefore, implementation of any kind of major restructuring involving those 132 companies will require actions beyond what UES itself can order. This situation has evidenced itself in strong opposition to restructuring of UES by some of the minority shareholders in these companies (mainly energos).

The question is how can the generating assets in the energos, only 9 of which are owned 100% by UES, be stripped out of those energos without unfairly decapitalizing the minority shareholders?

The restructuring plan approved by the parliament and signed into law by the President envisions setting up about 10 horizontal generating companies with no company having more than 35% of the generating assets in any given region. It is not clear how this will be done, and we suspect that this issue could delay a rapid implementation of the plan.

The purpose is to introduce competition into the generating sector. This sector is not presently in good condition. The average generating efficiency across the Holding is about 25%, considerably below what should be considered acceptable, let alone good. UES has talked about requesting bids from investors (domestic and foreign) either to buy some of the new generating companies, or to undertake management contracts. In either case, the investor/manager would be expected to improve the operations efficiency of the plants and bring them into line with world best practices.

However, there are risks to such actions for investors. We call this risk "the privatization sandwich." It is not the first time in post-Communist societies that we have seen this issue come up. The problem derives from the fact that the power plants will be sandwiched between two other sectors that are state-controlled and not likely to change soon: fuels on one side and the electricity markets on the other.

The fuel supply sectors of most concern are gas and coal. Natural gas in Russia has been a virtual monopoly in Russia, controlled by Gazprom (the world's largest gas company). Until very recently, Gazprom was the monopoly producer and transporter of natural gas in Russia, and continues to have a monopoly on exports of natural gas from Russia to countries outside the CIS. Gazprom is starting to buy some small quantities of natural gas being produced by some of the oil companies. However, those producers will not have, as we understand it, the right to sell to third parties; there is no third party access to the Gazprom pipeline systems.

But, Gazprom has a problem. As in many of the post-Communist countries, Russia inherits large price distortions in energy prices. The prices charged to consumers for natural gas, and for electricity, are substantially below economic costs. In the case of Gazprom, they survive

because they are getting very high prices for exported gas. Exports are subsidizing domestic sales. The price differential is considerable. UES is paying about $20 per thousand cubic meters, while export prices are in the range of $70 to $130, and probably average around $100. Since gas is sold directly to domestic consumers by Gazprom, the price of gas is a very sensitive social issue.

Coal is also being sold to UES at very low prices, around $20 per metric ton. We do not believe that such a price is even close to being an economic price for coal, most of which is mined using underground mining techniques.

Likewise, UES is selling electricity to retail consumers at very low prices, well below economic costs: about 1.2¢ per kWh. This is also a sensitive social issue. At the moment, UES makes a profit because the industrial price of electricity is considerably higher, thus the industrial sector is subsidizing the retail sector. No one expects this to remain a viable solution. Estimates are that retail prices must increase by two to three times in order for the system to approach a reasonable structure.

The generating plants are, therefore in a squeeze. There will be strong pressures from Gazprom and the coal miners to raise prices. But, passing through those increases will be difficult due to social pressures. This is what we mean by "the privatization sandwich."

To their credit, the government seems to recognize this as a problem. It has stated directly that it does not plan to release retail electricity prices to market anytime soon. They also seem to recognize that this will cause economic distortions, which they seem willing to consider funding. That is the only way, in our view, that investors or managers can be attracted into the sector.

Opportunities will indeed be created by the restructuring, renovation and modernization of the Russian electricity sector. We estimate that no less than $30 billion will be needed in the short term, and four times that much over the next ten years. Indications are that Russia is open to foreign involvement. However, it should be remembered that infrastructure, like power generation, is politically sensitive everywhere and stirs up xenophobic reactions.

Pan EurAsian will continue to follow the RAO UES restructuring program and its progress.

RAO UES Basic Facts

Physical	units	amount	share of Russian market
Total Installed capacity	MWe	156,100	73%
fossil-fueled	MWe	122,000	82%
hydro-electric	MWe	34,100	76%
Total length of transmission lines	'000 km	2,530	
Electricity production 2001	TWh	626.8	71%
-of which, thermal	TWh	501.0	87%
Heat production in 2001	Gcal	479.6	33%
Coal consumed	'000 tonnes	109.6	
Gas consumed	billion cubic meters	131.2	
Average number of employees		664,796	

General results for 2001 in millions of Roubles		approx. USD equivalent, millions
Total revenues	400,054	$14,288
electricity	296,127	10,576
heat	72,258	2,581
transmission fees	1,194	43
governmental assistance	3,297	118
other	27,178	971

Note: The above data apply to all the companies owned wholly or in part by RAO UES. They do not reflect the percentage claim that RAO UES may have on these data due to less than 100% ownership.

Net profit retained by RAO UES	12,777	456

Source: www.rao-ees.ru

Power Generation in Russia

Installed Capacity

thousand megawatts

	1999	2000	2001
Russian Federation total	214.3	213.3	215.5
Thermal	148.3	147.3	148.2
Hydroelectric	44.3	44.3	44.6
Nuclear	21.7	21.7	22.7
UES Holding total	156.2	155.1	156.1
Thermal	122.4	121.3	122.0
Hydroelectric	33.8	33.8	34.1

Generation

TWh

TOTAL RUSSIA	846.2	877.8	888.4
TOTAL RAO UES	602.2	622.8	626.8
share of total Russia	71.2%	71.0%	70.6%
Total thermal plants	489.5	504.8	501.0
share of Russian thermal	86.9%	86.8%	86.9%
Total hydroelectric	112.7	117.9	125.8
share of Russian hydro	69.8%	71.4%	71.8%
UES Thermal federal level	86.7	91.9	96.2
share of Russian thermal	15.4%	15.8%	16.7%
share of UES thermal	17.7%	18.2%	19.2%

Source: RAO UES annual reports for 2000 and 2001

Units and terminology:

Tonnes: metric tons (one metric ton is 2,204.6 pounds) / 7.33 barrels of oil

Cubic meter = 35.31 cubic feet