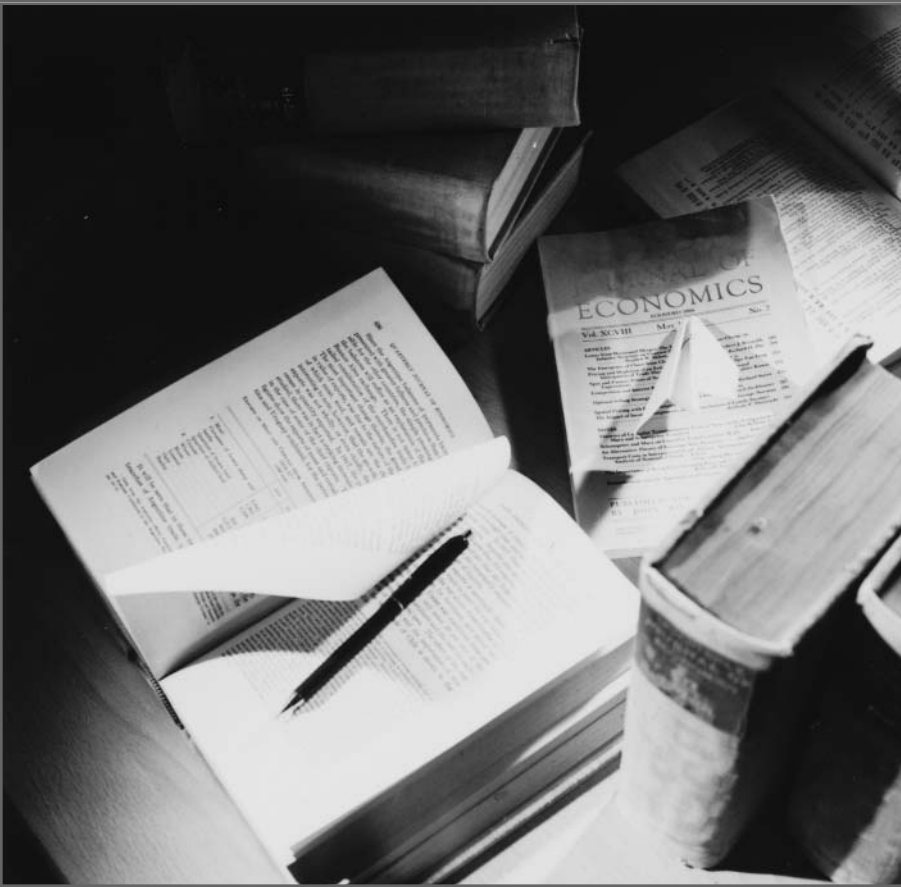




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Restructuring the Russian Electricity Sector: Re-Creating California?

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Abstract

The Russian Federation has begun the restructuring of its electricity sector, following the now standard restructuring model of complete vertical separation of generation from transmission, with the aim of creating competition in regional wholesale generation markets. This paper examines the structure of the six principal regional generation markets that are in their early stages of development and argues that they are likely to be characterized by high levels of market power on the part of individual privatized generation companies, especially during the peak winter demand season. These levels – considerably higher than those that caused competitive problems in California – seem to create a serious risk of price spikes in deregulated wholesale electricity markets, and thus of significant price increases to consumers of electricity.

JEL categories: L13, L22, L94, L98, P28

Keywords: Russia, electricity, restructuring, vertical separation, competition, market power.

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Restructuring the Russian Electricity Sector: Re-Creating California?

1. Introduction

The Russian electricity sector is in the relatively early stages of a mammoth restructuring process. The plan calls for complete ownership separation of electricity generation from long-distance transmission, with thermal generation plants privatized, nuclear and most hydro plants constituting separate state-owned generation companies, and the high voltage grid owned and controlled by a separate, state-owned National Grid Company. A small free market in wholesale electricity has been created that is to constitute a gradually increasing share of total electricity supply annually.

The goal of the restructuring strategy is the same as that behind the application of this now-standard reform model in other infrastructure sectors in other countries: to replace, where feasible, the old regulated, state-owned monopoly enterprises with deregulated, privately owned enterprises, competing among themselves to operate and invest efficiently and provide outputs at the lowest efficient prices.

As has been noted regarding the electricity sector as well as others, however, the degree to which this reform model performs well depends in no small part on the degree to which effective competition is actually created.¹ Economic theory suggests that welfare may well decrease rather than increase if a vertically integrated monopoly is separated into bilateral monopolists. In the electricity sector in particular, it appears that a large portion of the price increases in the disastrous California experience were the result of anticompetitive behavior – more specifically, the unilateral withholding of output by marginal producers – in the restructured and liberalized generation sector (Borenstein, *et al.*, 2002; Joskow and Kahn, 2002).

A recent study has raised the question of whether the Russian electricity system, as restructured according to current plan, may exhibit market power in several regional generation markets (IEA, 2004). As noted in that study, although Russian policy seeks to come as close as possible to creating a wholesale electricity market of national scope, the poor condition and small capacities of inter-regional high transmission linkages mean that for the foreseeable future there are likely to be six mostly distinct regional wholesale electricity markets, in regions labeled by the incumbent monopolist RAO UES as the Northwest (including St. Petersburg), Central (including Moscow), South, Volga, Urals, and Siberia. (A potential seventh regional market, the Far East, is apparently so fragmented that it is likely to be composed of multiple smaller regional geographic markets. This raises different issues from those of the present paper, and we do not consider the Far East further.)

¹ Newbery (1999); Pittman (2003a). See also Hogan (2002): “Substantial market power would call into question any proposal to rely on markets for generation”, and Thomas (2004): “it is far from clear that a weakly regulated [generation] oligopoly is preferable to a properly regulated monopoly.”

The IEA study warns that under current plans for the future ownership of particular generation plants by particular newly created regional and national generation companies, the wholesale electricity markets in several of these regions will be structured oligopolistically rather than competitively, with the top four generation companies controlling 92 percent of capacity in the Volga region, 85 percent of capacity in the Northwest region, and no less than 60 percent in the others.²

This paper argues that the important IEA warning of market power in future regional wholesale electricity markets in Russia in fact likely understates the risk. Though the IEA notes that “technological or seasonal problems affecting one of the two large[st] companies [in a region] could sharply increase the other’s ability to control the available capacity to meet residual demand,” that study does not systematically consider the degree to which such problems may occur in each region, exacerbating the problems that are suggested by the raw concentration data.

In this paper, I examine more closely the degree to which particular generation plants may act as base-load plants in particular seasons – especially, combined heat and power generating plants in the winter season that is the peak season for demand in Russia – and the degree to which the reduced set of plants with production flexibility may enjoy market power during particular seasons. The level of market power possessed by particular peak-load plants is further highlighted by two additional factors not included in the IEA and most other analyses: the fact that regional generation capacity varies across different seasons when hydro generation is an important component of the mix, and the fact that when a particular generation company owns both base-load and non-base-load plant it may have increased incentives to restrict peak production, as the base-load plant may earn the resulting inframarginal rents. Generation markets that appear relatively less concentrated with annual data may show higher concentration levels in particular seasons and with these additional factors included.³

Overall, the more detailed data demonstrate that the current plan for restructuring the Russian electricity system is likely to create significant levels of market power and even monopoly power under peak load conditions in particular regions – market and monopoly power that could be exercised with great harm to Russian economic welfare.

² It is important to acknowledge – as the IEA report does – that these regional markets are merely rough forecasts: it is impossible to know exactly what will be the boundaries of regional electricity markets in Russia until the markets begin to operate. Further, the boundaries of the markets will doubtless vary according to the state of demand and production. Nevertheless there is widespread acceptance that wholesale electricity markets in Russia will be regional rather than national. See, *e.g.*, CMS Cameron McKenna (2004): “Interregional integration is generally quite weak, as the system was developed primarily to connect large power stations to closed centres of industrial load, although some capacity providing not much more than interregional emergency support does exist.”

³ On the other hand, spot markets for electricity that appear to exhibit market power may be less worrisome than they appear to the degree that there are long-term vesting contracts between generation companies and customers that reduce the returns to the withholding of output (Green, 1999). I will return to this in the Conclusion. I am grateful to James Wilson for emphasizing this point.

2. The Policy Setting⁴

Since 1992, RAO UES has owned, in addition to the nationwide high-voltage transmission grid, all of the large thermal generation plants, all the hydro plants, and the Central Dispatch Unit. Nuclear powered generation plants are owned by the Ministry of Atomic Energy and operated by the state-owned company RosEnergyAtom. Smaller thermal plants – many of them cogeneration (*i.e.*, combined heat and power) facilities – have been controlled by regional power companies called AO-*energos*, which are in turn owned and controlled to differing degrees by RAO UES and by regional authorities.

Under the restructuring plan, the national transmission system would be turned over to a new company called the Federal Grid Company in which the federal government will own a majority share. Vertical separation would be complete; the Federal Grid Company would own or control no generation assets. The state would continue to own and control all nuclear and most hydro powered generation facilities.⁵ The thermal generation facilities now owned by RAO UES would be sold off to six new private companies of roughly equal size that would be expected to compete among each other in regional markets throughout the Russian Federation; in addition, there will be fourteen smaller, territorial generation companies owning and operating the smaller generation plants. The stated rationale behind the number of new generation companies chosen is to create competitive generation markets while at the same time constructing companies that are large enough to achieve management efficiencies and for their shares to enjoy market liquidity.⁶ In order to create and preserve competitive generation conditions, no single company will be permitted to own more than 35 percent of the generation capacity in any wholesale price zone. As competitive generation markets are created in various regions, wholesale price regulation will be gradually eliminated.

As I have argued in previous papers (Pittman, 2003a and 2003b), there are likely to be a number of potential problems with vertical separation as a restructuring plan. Complete separation of the grid company from the generation companies removes any economies of vertical operations across these two activities and correspondingly imposes new transactions costs – using this term very much in the sense of the “transactions cost economics” of Williamson (2000). One aspect of these costs that has been a special concern in electricity sectors around the world has been the difficulty of creating appropriate incentives for expenditures on maintenance and improvements on the part of the grid company.⁷ This has been a problem in the railways sector as well, particularly in the UK.

⁴ For more information see, *e.g.*, Hubert (2002), Kennedy (2002), Tompson (2004), International Energy Agency (2004), and Yi-Chong (2004).

⁵ In this sense one could argue that vertical separation would not really be “complete”, since the state would continue to own the separate grid, nuclear, and hydro companies. However, to the extent that nuclear and hydro are base-load technologies, the question of discriminatory access to the grid – generally the primary argument for complete vertical separation – becomes a less important factor.

⁶ See, *e.g.*, Galkin and Zsiga (2004).

⁷ See OECD (2005): “Under-investment in transmission networks and inter-connectors has been a thorny issue in the US, and it now appears to be emerging in Europe, particularly in the wake of the power failures of 2003.” See Buehler, *et al.* (2004) for a theoretical discussion.

A second potential problem is the complicated institutional structure that is under discussion and construction to manage the operation of the markets to be created. Regarding the generation/transmission interface there has been discussion of a transmission system operator, a separate national systems operator, and a regulator to keep an eye on both. Regarding efficient price signals for generation (especially investment in new generation), there has been discussion of locational marginal pricing that would reflect transmission constraints. Further regarding incentives for investment in generation, there have been calls for some form of “capacity payment” schemes. (On all three of these points, see World Bank [2004a].) All of these, and their fellows, individually and in concert, imply a level of experience and sophistication of the Russian governance and regulatory mechanisms that may be quite optimistic.⁸

Perhaps most important, however, it is not at all clear that the plan will succeed in creating competition in generation markets.

First of all, these six large generation companies will be encountering each other in multiple geographic markets in repeated interactions over time (and perhaps indeed in other product markets as well, depending on the identity of the purchasers of the six large companies). It seems quite possible that they will be able to learn from their experiences and coordinate their interactions in such a way as to maximize prices and profits rather than competition and efficiency in particular regional markets.⁹ The fourteen smaller regional generation companies will play the same intertemporal game without its interregional dimension.

Second, a good deal of generation in any particular geographic market is likely to be base-load rather than peak-load – that is, capacity that operates constantly and regardless of (most) fluctuations in wholesale electricity prices, similar to what is sometimes termed “must run” generation capacity. Most supply responses to wholesale price fluctuations will take place in the smaller set of capacity represented by peak-load plants, and among these plants the upward slope in the supply curve may become quite dramatic. In combination with the extremely inelastic short-term demand for electricity – because of the general absence of real-time pricing – this creates strong incentives for the exercise of market power by owners of marginal generation plants, a problem that even experienced regulators in places like California and the UK have had difficulty combatting.

⁸ See Bayliss (2001): “Even now – ten years since privatization – Ofgem, the UK regulator – is struggling to prevent market abuses by private firms. This is in a wealthy country where the regulator has substantial resources. How much more difficult then is the job of the regulator in developing countries where organizations are staffed by poorly paid public sector workers with little exposure to international corporate activities and where the ‘opposition’ consists of highly paid internationally trained corporate executives. What is more, the regulator has little at hand in the way of sanctions, should the firm refuse to adhere to the rules of the regulator.” Yi-Chong (2005) discusses the problems inherent in pushing a policy reform agenda for the electricity sector that requires more sophistication governance and regulatory mechanisms than are likely to be available. See also World Bank (2004b).

⁹ See, *e.g.*, the discussion in Pogrebniak (2005) and as the empirical results of Fabra and Toro (2005).

As noted earlier, for the foreseeable future Russian wholesale electricity generation markets will be regional, not national. However, even for the Russian Federation as a whole, note that 16.3 percent of generation capacity is nuclear, 19 percent is coal, and 17.1 percent is hydro; the first two are almost always base load and the third is flexible only to some degree and under some circumstances. In addition, about a third of capacity is co-generation (combined heat and power), which is very likely base-load during the long Russian winter.¹⁰ Finally, recall that both nuclear and most hydro capacity will remain under government ownership.

In this context, six does not seem a large number of nationwide generating companies, nor 35 percent a strict limit on the share of total generation capacity controlled by a single firm in a particular geographic market. In the electricity restructuring in California, the 54 percent of generation capacity that was represented by thermal production – mostly “relatively old gas-fired steam and combustion turbine capacity” – was divided primarily among five new generation companies that individually controlled 16 to 22 percent of *this 54 percent of total capacity*.¹¹ These firms then individually controlled only 8.6 to 11.9 percent of total generation capacity; yet analysts later estimated that “market power [in generation] could be blamed for 59 percent of the increase in wholesale electricity prices from summer 1999 to the crisis in summer 2000.”¹² Similarly, one of the architects of British electricity restructuring, Stephen Littlechild, admitted in 1999 that there was “still scope to exercise substantial market power” in the UK generation sector – and this at a time when the largest participant had only 21 percent of national generation.¹³

3. The Structure of Regional Generation Markets in Russia

Table 1 shows the regional generation market shares of companies according to the announced allocation of particular generation plants to the newly created regional and national generation companies, as well as to the government-owned nuclear (RosEnergoAtom) and hydro (Hydro OGC) companies. The shares are similar to those presented in Table 7 of the IEA study, with differences owing to different reports of ultimate plant ownership, different estimates of plant capacity from different sources, and a few plants allocated to different regions. Under the generally accepted wisdom that a particular level of market concentration suggests more market power in electricity generation markets than in the average commodity market,¹⁴ these markets all appear at least moderately concentrated, raising concerns about the presence of market power. The four-firm concentration ratios in the seven regional markets range from 60 to 92 (59 to 93 in the IEA study), while the Herfindahl-Hirschman indexes (HHIs) range from 1205 to

¹⁰ All of these share estimates are taken from Tompson (2004).

¹¹ Blumstein, *et al.*, 2002; Puller, 2002. For valuable broad discussions of the California experience, see Brennan (2001) and Joskow (2001).

¹² Sherman, 2003, citing Borenstein, *et al.*, 2002; see also Joskow and Kahn, 2002.

¹³ See also Green and Newbery (1997), Wolfram (1999), and Day and Bunn (2001) on market power in the restructured UK generation sector.

¹⁴ The reasons include non-storability of product, inelasticity of supply and demand at peak periods, and transmission bottlenecks that may preclude supply increases at almost any price. See, for example, Newbery (2003) and Bushnell (2005).

2249 (1196 to 2293 in the IEA study).¹⁵ (Note that the data for California in Table 1 of Blumstein, *et al.* [2002] yield a four-firm concentration ratio of 53 and an HHI of 930.)

However, the data in this Table should arguably be adjusted in several ways if they are to give an accurate picture of market concentration and behavior in the future. The adjustments proposed in this paper take four forms: a) the separation of base-load plants from the more flexible peak-load plants, which includes both b) a closer analysis of the production flexibility of hydro plants, and c) the inclusion of combined heat and electricity plants in the base-load category during the winter; and d) the adjustment of capacity shares to reflect differing hydro capacities during different seasons. Let us consider these four in turn.

First, it is a well known feature of electricity generation that different technologies exhibit great differences in both fixed and variable costs. Plants with high fixed costs but low variable costs generally run at full capacity and are termed base-load plants; plants with lower fixed costs but higher variable costs run when the level of demand justifies their addition to the mix and are termed flexible or peak-load plants. Nuclear plants are always base-load plants, and coal-fired plants nearly always so. Natural gas plants, especially the modern combined-cycle generating technology (CCGT) plants, are generally flexible, as are the older oil-fired plants, most of which have been replaced in Russia and elsewhere by gas-fired plants.

Hydro plants occupy more of a middle ground here. In the Russian situation, as in many transition countries, hydro plants will be mostly state-owned – in this case, part of the large, state-owned Hydro OJSC generation company – and there is no clear indication yet how much their production levels may be varied in response to wholesale electricity prices.¹⁶ In general, even hydro plants that have large reservoirs and can be operated according to economic signals are not fully flexible as electricity generators, since they are also operated in response to demands related to irrigation, drinking water supply, and the preservation of environmental amenities. Moreover, hydro plants operate subject to the constraints of river flows. Many hydro plants have large reservoirs in which they can store water and then release it for power generation at a later time, but others, called “run of river” plants, lack such reservoirs and so operate passively, generating electricity as the river flows.¹⁷ Even hydro plants that have reservoirs may find their storage capacities overwhelmed by water flows in the spring and so have no effective ability to vary generation load. Finally, many analysts believe that when the rules and regulations for

¹⁵ These are the two most commonly used measures of market concentration in the industrial economics literature. The four-firm concentration ratio is the percentage of market sales accounted for by the four firms with the largest individual shares. The HHI is the sum of the squared percentages accounted for by all firms in the market.

¹⁶ For example, IEA (2005) expresses the concern that the state may use hydro generation strategically to keep prices down, which would protect the population from price spikes but also create uncertainty for private investors in generation facilities. This would suggest the allocation of hydro plants where such flexibility is possible to the flexible, peak-load category. Bushnell (2003) emphasizes both the importance of and the difficulty of predicting the behavior of a publicly owned hydro generation firm in analyzing the likely competitive outcomes in particular wholesale generation markets.

¹⁷ See, for example, Arellano (2004) and Atkinson and Halabí (2005).

generation markets are finalized, Russian hydro plants will be paid regulated prices based upon average costs rather than free prices based upon market marginal costs. Thus in many situations it may be appropriate to consider hydro plants as base-load rather than flexible generation plants.

Furthermore, as noted earlier, fully one-third of Russia generation capacity consists of plants that are combined heat and electricity generation facilities. Like hydro plants that must consider other demands for water, combined heat and power (CHP) plants cannot be fully responsive to price signals in wholesale electricity markets. One assumes that during the Russian winter these plants will be run under almost any regime of electricity prices, given the inelasticity of demand for district heating. (In fact many of these plants cannot be operated economically with the heat generation function turned off – in what is called “condensing mode” – and so are not operated during the warm weather.) Considering the length of the Russian winter in many regions, it is probably a conservative adjustment to allocate these plants to the base-load category only during the three months of the official winter season.

It is then when these CHP plants are moved from the flexible to the base-load category that we encounter the further problem discussed earlier: the fact that a generation company owning both base-load and non-base-load plant may enjoy enhanced incentives to restrict peak production, so that its base-load plants (under some pricing circumstances) earn inframarginal rents (Wolfram, 1998).

Finally, it is a common feature of countries with variable weather conditions that the generation capacity of hydro plants varies a good deal across different seasons. This means that a single aggregate “capacity” figure for a given region – as used in Table 1, in the IEA’s Table 7, and presumably in the 35 percent ceiling for individual firm market share in the Russian legislation – may mask seasonal variation. In this paper we use the variation exhibited in hydro production in each region over the past four years to adjust seasonally the listed capacities of the hydro plants in each region (Table 2).¹⁸

Let us consider the structure of the individual Russian regional wholesale electricity markets taking account of these additional factors.

3.1 The Volga Region

I begin with the Volga region because it offers perhaps the most striking example of the high level of market power in a regional market as demonstrated by the inclusion of these factors in the analysis.

Tables 3S, 3F, and 3W list the individual generation plants in the Volga region, grouped according to their announced post-privatization ownership and separated into base-load and non-base-load technologies, for the spring, summer/fall, and winter seasons, respectively. Higher water flows yield greater hydro plant capacities in the spring and

¹⁸ Bushnell (2003) performs similar adjustments for seasonal water flows in his simulation of strategic behavior by a hydro generation firm.

overwhelm production flexibility for some of the hydro plants in the spring as well. More crucially, the very large number of CHP plants lose their flexibility and become peak-load plants in the winter.

Even in the spring, summer, and fall, market structure appears to be of more serious concern than is indicated by the unadjusted figures in Table 1 (and the IEA's Table 7). In the spring, 43 percent of capacity is base-load. The top four non-base-load generation companies control the remainder of capacity, so the generation market in the spring is indeed a four-firm oligopoly, with a four-firm concentration ratio for non-base-load generation of fully 100 percent. It should be a matter of serious concern for electricity customers in the Volga region that in the spring season, the firms TGK-7, Tatenergo, TGK-5, and TGK-6 will likely have abilities significantly greater than those enjoyed by generation companies during the California crisis to manipulate prices, either by coordinating their production levels or by withholding output unilaterally.

The situation is better in the summer and fall than in the spring, but only marginally so, and only if we assume that the Zhigulevskaya and Cheboksarskaya hydro plants belonging to the Hydro OGK will be operated according to price signals from the wholesale electricity market. Even in that optimistic situation, with base-load generation accounting for 23 percent of capacity, non-base-load generation is now a five-firm oligopoly, with a four-firm concentration ratio of 96 percent. The same four generation firms listed in the previous paragraph now have only the state-owned generation company Hydro OGK added to their numbers as a tight oligopoly – though if the two hydro plants are in fact operated independently of the oligopoly and according to market signals, the market power of the other four non-base-load generation companies will be correspondingly reduced.¹⁹

It is in the winter, however, that the situation becomes most serious, as we assume that the CHP plants become base-load (“must run”) in order to supply heat to the population. That factor, combined with the reduction in hydro capacity during the winter season, renders 72 percent of capacity as base-load, leaving only the same two hydro plants, a single gas plant owned by TGK-7, and three plants owned by Tatenergo as flexible, peak-load capacity. At best the result is a two-firm oligopoly with a non-participating hydro fringe; at worst it is virtually a Tatenergo monopoly, with miniscule TGK-7 capacity and two plants owned by Hydro OGK that may or may not act to limit the power of Tatenergo to manipulate prices. Of course, it is in precisely the winter season of peak demand that surplus electricity from neighboring regions is least likely to be available in response to wholesale price increases. All in all, the competitive situation regarding Volga generation in the winter could be a very troublesome one for Russian regulators.

¹⁹ Of course one cannot eliminate the possibility that a regional generation cartel – explicit or tacit – will find a way to include the managers of the regional hydro plants in the spoils of the exercise of market power, and so exercise this market power without the unwelcome interference of the fringe plants.

3.2 The Central Region

The situation during times of peak demand is not much better in the Central region. Tables 3.2S, 3.2F, and 3.2W show the plant-level configuration in the spring, summer/fall, and winter seasons, respectively.

During the spring, base-load plants constitute 31 percent of capacity, as multiple hydro plants are unable to operate with significant flexibility. Non-base-load capacity is divided among ten regional and national generation companies, with the top four – TKG-3, OGK-3, OGK-6, and TKG-4 – accounting for about two-thirds of non-base-load capacity. The summer/fall seasons are basically the same if one assumes non-flexibility on the part of hydro plants, and somewhat less concentrated if the hydro plants are assumed to respond to wholesale market price signals.

Again, however, the likelihood that CHP plants become “must run” in the Russian winter has a serious impact on the competitiveness of generation markets (and again this effect is exacerbated by a reduction in hydro capacity as compared with the spring). Now base-load capacity accounts for 58 percent of generation capacity. There remain ten generation companies with non-base-load capacity, but they are dividing a much smaller pie. The four-firm concentration ratio for non-base-load capacity in the winter is 74 percent. Furthermore, TKG-4, TKG-3, TKG-6, and TKG-8 all have significant base-load capacity, raising the possibility that anticompetitive output restriction by these companies would yield monopoly rents for these inframarginal plants – depending, of course, on the price system chosen for inframarginal plants generally. As with the Volga region, it appears that in the peak demand periods of winter there may be serious problems with competition in the Central region generation market, and so a real danger of significant price spikes during periods of peak demand.

3.3 The Northwest Region

There may be significant problems with concentration in the Northwest region as well. In the spring/fall (Table 3.3SF) and summer (Table 3.3SU) seasons, base-load generation accounts for not quite 40 percent of generation capacity. In all three of these seasons, the top four non-base-load generation companies -- TKG-1, OGK-6, TKG-2, and OGK-3 – control over three-fourths of the remaining capacity, raising the possibility of coordinated behavior in such a concentrated market. In addition, the top non-base-load generation company, TKG-1, owns a large number of base-load hydro plants, which raises additional concerns about the withholding of peak-load production in order to earn inframarginal rents on base-load capacity. In both cases there are two small additional non-base-load generation companies – TKG-9 and OGK-2 – that may provide some small challenges to anticompetitive output reductions by the big four.

In the winter, when the many CHP plants move into the base-load category, base-load generation accounts for a very high 72 percent of all generation capacity. In that case, as in some other regions, especially during periods of peak demand, virtually all non-base-load capacity is controlled by only four generation companies – OGK-6, TKG-1, OGK-3,

and OGK-2 – and again one of these, TKG-1, controls significant amounts of base-load capacity as well. One must conclude that anticompetitive behavior by a small number of oligopolists playing a repeat game is a significant worry in the Northwest region as well.

3.4 The Siberia Region

In Siberia there appear to be no generation plants that meet the usual qualifications for base-load capacity in the spring and fall (Table 3.4SF), so the competitive situation in those seasons is essentially the same moderately concentrated level as in Table 1: the top four privately owned firms own 56 percent of capacity, with seven firms with significant additional capacity. Combined with the 21 percent of capacity controlled by Hydro OGK, this may be the least worrisome situation of all six regions in all four seasons.

Things are not quite as bright in the summer and winter, however, with the reallocation of some generation plants into the base-load category removing some of the flexibility in the market. In the summer it is the loss of hydro flexibility that moves almost 53 percent of capacity into the base-load category (Table 3.4SU). In that case the top four non-base-load companies – TKG-11, Irkutskenergo, Novosibirskenergo, and TKG-12 – come to control almost two-thirds of non-base load capacity, with the additional problematic incentive feature that Irkutskenergo controls significant base-load hydro capacity as well.

In the winter it is the loss of flexibility in the CHP plants that moves 29 percent of generation capacity into the base-load category (Table 3.4W). Now the top four privately owned non-base-load generation companies – Irkutskenergo, TKG-11, TKG-12, and OGK-3 – account for 30 percent of non-base-load generation capacity, and the behavior to be expected from the almost 20 percent of capacity accounted for by Hydro OGK (once the Boguchanskaya GES plant is completed) takes on great importance. A likely exacerbating factor here is that three of these four top non-base-load generation companies – Irkutskenergo, TKG-11, and TKG-12 – control significant amounts of base-load CHP capacity as well, which may encourage them to restrict production in their non-base-load plants.

3.5 The South Region

The Southern region – sometimes referred to as the “Northern Caucasus” region – is unusual because the peak of hydro production – when many hydro plants become base-load – is in the summer rather than the spring, and because it has only a small number of CHP plants that become base-load in the winter. Of course the winter weather is less fierce in this region, so the winter peak in demand is less pronounced as well, but we do not deal with that factor here.

In the spring and fall (Table 3.5SF), base-load power is only 14 percent of generation capacity, while in the summer (Table 3.5SU) it is 37 percent. However, in either season there are only four significant privately owned non-base-load generating companies (ignoring the tiny Argunskaya CHP plant), one of which (TKG-8) owns a small base-load plant as well. Such a small number of competitors playing this repeat game may well be

able to coordinate production decisions in such a way as to raise wholesale prices, although in the spring and fall the government-owned Hydro OGK could use its considerable capacity to mitigate anticompetitive reductions in output.

The situation becomes slightly worse in the winter (Table 3.5W), because so many of the TKG-8 generation plants are CHP plants that move into the base-load category. Otherwise the situation is the same as the fall: four firms with almost all the privately owned non-base-load generation capacity, but subject to procompetitive output increases by Hydro OGK plants should they decide to act as load-shavers.

Thus in the South the situation appears worst in the winter if one fears incentives by base-load plant owners to restrict peak-load output in order to seek inframarginal rents, but worst in the summer if one forecasts that the government-owned Hydro OGK can be counted on in the other seasons to use its production flexibility to defeat anticompetitive price increases. In all four seasons there appears to be a real potential for anticompetitive behavior among this group of only four privately owned non-base-load generation companies.

3.6 The Urals Region

The Urals region appears on the unconcentrated end of the spectrum in Table 1, but becomes perhaps a bit more problematic when we look more closely at seasonal and flexibility factors.

In the spring and summer/fall seasons (Tables 3.6S and 3.6F), only a very small share of generation is base-load, so non-base-load generation concentration is not appreciably greater than annual overall generation concentration. However, fully 27 percent of Urals generation capacity is made up of CHP plants, and thus in the winter, base-load generation increases to the 29 to 31 percent range, depending on how one treats the Votkinskaya and Kamskaya hydro plants (Table 3.6W). There remain nine companies with non-base-load generation, but the top four – OGK1, OGK2, OGK4, and OGK5 – account for around two-thirds of non-base-load generation capacity. On the other hand, none of these four owns any CHP plants, so there is no additional incentive to withhold output for inframarginal gains at base-load plants.

3.8 Cross-Regional Issues

As the preceding analysis suggests, when all the relevant seasonal factors are taken into account, there appear to be real reasons for concern regarding anticompetitive structure and behavior in the majority of these post-restructuring regional generation markets in Russia.

Two additional, related findings are suggested by the previous analysis. First, in terms of repeat games across regions rather than over time, there will be what we might characterize as a moderate amount of intermarket interaction among the announced privatized generation companies. Among those in the top four owners of flexible

generation plant in each region, OGG-3 appears in both the Central and Northwest regions; OGG-7 appears in the Central, South, and Northwest regions; OGG-2 appears in the Urals, South, and Northwest regions; and OGG-5 appears in the Urals and South regions. There are of course more cross-regional interactions if we move beyond the top four generation companies in each region, as Table 1 demonstrates. Regardless of who ultimately comes to own these national generation companies, it seems unlikely that they will ignore their frequent interactions across geographic markets when they make their production decisions.

Second, it has gone largely unremarked (to my knowledge) in the discussions of Russian electricity restructuring, but it is clear from the Tables presented above that there is virtually no Russian generation capacity that remains to be purchased by a buyer who is unsuccessful in bidding for one of the national or regional generation companies (or not interested in doing so). One of the rationales for this research project was to discover how much generation market “deconcentration” might be expected from asset purchasers so far unidentified, purchasing generation assets so far unassigned to particular generation companies; the answer is, almost none. Furthermore, though it is quite possible that new generation capacity will be constructed – for example, by industrial firms with access to inexpensive gas supplies – this procompetitive action is discouraged by the provisions of the reform laws barring any single company from owning both generation and transmission assets (Branan, 2004). Absent changes in the allocation of generation plants to generation companies, then, the structure of Russian regional electricity generation markets has already been determined – and the likelihood of anticompetitive behavior, with the resulting increases in consumer prices, is real.

4. Conclusion

It is difficult to tell in advance how competitive each regional wholesale electricity market in Russia will be. Russia is only now beginning its experience with dispatching electricity flows in response to market signals, and the precise locations where there may be congestion or where electricity may flow from one “region” into another in response to demand/supply imbalances remains to be seen (and will, of course, depend in part on the regulation and pricing of transmission).

Still there is enough information available that one may make at least educated guesses about the likely outcomes of particular policy decisions that have already been made. Until very large additional amounts of resources are devoted over long periods of time to upgrading the long-distance transmission system, something like the six regions that (along with the Far East) are the basis of RAO UES operations will likely act as regional wholesale electricity markets under most circumstances, and especially under peak-load circumstances – those very times when the balance of inelastic supply and inelastic demand is most likely to yield significant wholesale price increases.

Likewise, and building on the work of previous researchers, we may make certain assumptions about the behavior of particular generation plants under particular conditions – that CHP plants will not be particularly flexible during peak-demand winter months,

that some hydro plants have more production flexibility than others, and that some lose their flexibility at times of peak water flow – that allow us to predict in more detail what the competitive structure of the flexible portion of particular regional generation markets may look like.

Using these simple tools, this paper reaches findings that suggest that the warnings of the recent IEA study of Russian electricity restructuring concerning the likelihood that some regional markets may not be competitively structured are, if anything, understated. It appears that several regional generation markets may be characterized by tight four-firm oligopolies or even worse during periods of peak demand, and that in many cases the firms in those tight oligopolies may face further incentives to restrict output because of their ownership of base-load as well as non-base-load plants. After the experiences of California, the UK, and other locales with sizable price increases from generation companies able to restrict output anticompetitively in oligopolistic markets, Russian policy makers may want to consider carefully whether their current electricity market restructuring plans risk creating similar problems at home.

What are the policy alternatives available? A thorough discussion is beyond the scope of this paper, but several candidates should be mentioned. First of all, many of the problems that have appeared in restructured electricity markets in other countries have been due at least in part to the very inelastic supply and demand curves that are characteristic of this sector, especially during times of peak demand. Thus policies that seek to render supply and/or demand more elastic have an obvious appeal (Borenstein and Bushnell, 1999; Borenstein, Bushnell, and Knittel (1999). For example, as noted earlier, improved interregional transmission capabilities would enlarge wholesale geographic markets and tend to reduce market power, especially to the degree that peak times in adjacent regions are not simultaneous. Similarly, one could argue for a demonopolization scheme that resulted in an increased number of smaller companies, each with correspondingly less market power and thus reduced incentives to restrict output. (This is an option urged by World Bank [2004a].) Third, some kind of system of “capacity payments” may encourage the construction of new generation plants in the future, thus similarly reducing the market power of existing plants. Fourth, the more that large users are made subject to real-time pricing, the greater will be the ability of the system to avoid the largest price spikes. Finally, long-term contracts between generation companies and large customers may reduce the returns to generation companies from withholding output in order to increase spot prices.

None of these potential “fixes” is easy, or without potential drawbacks. There is a small but growing group of electricity market skeptics around the world who argue that, even with ameliorative policies like these, the creation and operation of “free” markets in electricity has turned out to be sufficiently expensive, complex, and difficult as to call into question the entire reform strategy of vertical separation here. These skeptics argue that the old electricity sector model of regulated vertically integrated monopolists may not have performed so badly after all in retrospect. Perhaps it is too late in the day for Russia to reconsider its overall electricity reform strategy, and ameliorative measures such as those listed in the previous paragraph are the best we can do. Still, Brennan

(2001) and others urge us to face the very real possibility that “electricity will be the sector in which markets meet their match.”

References

Arellano, M. Soledad (2004), "Market Power in Mixed Hydro-Thermal Electric Systems," working paper, Universidad de Chile, April.

Atkinson, Scott E., and Claudia Elizabeth Halabí (2005), "Economic Efficiency and Productivity Growth in the Post-Privatization Chilean Hydroelectric Industry," *Journal of Productivity Analysis*, 23, 245-273.

Bayliss, Kate (2001), "Privatisation of electricity distribution: some economics, social and political perspectives," working paper, Public Services International Research Unit, School of Computing and Mathematical Sciences, University of Greenwich, April.

Blumstein, Carl, Lee S. Friedman, and Richard Green (2002), "The History of Electricity Restructuring in California," *Journal of Industry Competition and Trade*, 2, 9-38.

Borenstein, Severin, and James B. Bushnell (1999), "An Empirical Analysis of the Potential for Market Power in California's Electricity Industry," *Journal of Industrial Economics*, 47, 285-323.

_____, _____, and Christopher R. Knittel (1999), "Market Power in Electricity Market: Beyond Concentration Measures," working paper PWP-059r, Program on Workable Energy Regulation (POWER), University of California Energy Institute, February.

_____, _____, and Frank A. Wolak (2002), "Measuring Market Inefficiency in California's Wholesale Electricity Market," *American Economic Review*, 92, 1376-1405.

Branan (2004), "Restructuring of Regional Electricity Companies," in Terterov (2004).

Brennan, Timothy J. (2001), "The California Electricity Experience, 2000-01: Education or Diversion?," Washington, DC: Resources for the Future, RFF Report, October.

Buehler, S., A. Schmutzler, and M.-A. Benz (2004), "Infrastructure quality in deregulated industries: is there an underinvestment problem?" *International Journal of Industrial Organization*, 22, 253-268.

Bushnell, James (2003), "A Mixed Complementarity Model of Hydrothermal Electricity Competition in the Western United States," *Operations Research*, 51, 80-93.

_____, (2005), "Looking for Trouble: Competition Policy in the U.S. Electricity Industry," in Griffin, James M. and Steven L. Puller, eds., *Electricity Deregulation: Choices and Challenges*, Chicago: University of Chicago Press.

CMS Cameron McKenna (2004), "Practical and Institutional Barriers to Reform Implementation," in Terterov (2004).

Day, Christopher J., and Derek W. Bunn (2001), "Divestiture of Generation Assets in the Electricity Pool of England and Wales: A Computational Approach to Analyzing Market Power," *Journal of Regulatory Economics*, 19, 123-141.

Fabra, Natalia, and Juan Toro (2005), "Price Wars and Collusion in the Spanish Electricity Market," *International Journal of Industrial Organization*, 23, 155-181.

- Galkin, Mikhail, and Andreas Zsiga (2004), "Mosenergo," in Terterov (2004).
- Green, Richard (1999), "The Electricity Contract Market in England and Wales," *Journal of Industrial Economics*, 47, 107-124.
- _____, and David M. Newbery (1997), "Competition in the Electricity Industry in England and Wales," *Oxford Review of Economic Policy*, 13, 27-46.
- Hogan, William W. (2002), "Electricity Market Restructuring: Reform of Reforms," *Journal of Regulatory Economics*, 21, 103-132.
- Hubert, Franz (2002), "Reform of Russian Power Industry: Which Lessons from Abroad?," working paper, Humboldt Universität zu Berlin, March.
- Joskow, Paul L. (2001), "California's Electricity Crisis," *Oxford Review of Economic Policy*, 17.
- _____ and Edward Kahn (2002), "A Quantitative Analysis of Pricing Behavior in California's Wholesale Electricity Market During Summer 2000," *Energy Journal* (December 2002), 1-35.
- Kennedy, David (2002), "Liberalisation of the Russian Power Sector," working paper #69, European Bank for Reconstruction and Development, January.
- Littlechild, Stephen C. (1999), "Privatisation, Competition and Regulation," speech before the Wincott Foundation, December.
- Newbery, David M. (1999), *Privatization, Restructuring, and Regulation of Network Utilities*, Cambridge, MA: MIT Press.
- _____ (2003), "Regulatory Challenges to European Electricity Liberalisation," *Swedish Economic Policy Review*, 9, 9-44.
- Pittman, Russell (2003a), "Vertical Restructuring (Or Not) of the Infrastructure Sectors of Transition Economies," *Journal of Industry, Competition and Trade*, 3, 5-26.
- _____ (2003b), "Reform in the Rail and Electricity Sectors in Russia: Restructuring, Competition and the Ministry for Antimonopoly Policy," *Acta Oeconomica*, 53, 339-362.
- Pogrebniak, Evgeniy (2005), "Simulation Model of a Competitive Wholesale Power Market in Russia and Measures for its Development, Institute for Complex Strategic Studies, Moscow, presented at the VI International Scientific Conference, "Modernisation of Economy and Nurturing of Institutions," State University – Higher School of Economics, Moscow, April.
- Puller, Steven L. (2002), "Pricing and Firm Conduct in California's Deregulated Electricity Market," working paper, Program on Workable Energy Regulation (POWER), University of California Energy Institute, August.
- Terterov, Marat, ed. (2004), *Doing Business with Russia's Electrical Energy Sector*, London: Kogan Page.

Thomas, Steve (2004), "Evaluating the British Model of Electricity Deregulation," *Annals of Public and Cooperative Economics*, 75, 367-398.

_____ (2005), "Electricity Privatisation and Restructuring in Russia and Ukraine," working paper, Public Service International Research Unit, School of Computing and Mathematical Sciences, University of Greenwich, January.

Tompson, William (2004), "Restructuring Russia's Electricity Sector: Towards Effective Competition or Faux Liberalisation?" Economics Department Working Paper No. 403, Paris: Organization for Economic Cooperation and Development, September.

Wolfram, Catherine D. (1998), "Strategic bidding in a multiunit auction: an empirical analysis of bids to supply electricity in England and Wales," *RAND Journal of Economics*, v. 29, 703-725.

_____ (1999), "Measuring Duopoly Power in the British Electricity Spot Market," *American Economic Review*, 89, 805-826.

Williamson, Oliver E. (2000), "The New Institutional Economics: Taking Stock, Looking Ahead," *Journal of Economic Literature*, v. 38, 595-613.

World Bank (2004a), "Structural and Design Issues in the Russian Electricity Reforms: A Policy Note," Infrastructure and Energy Services Department, Europe and Central Asia Region, June.

_____ (2004b), "Policy Perspective and Analysis of the Regulatory Regime in the Restructured Russian Power Sector: A Policy Note," Infrastructure and Energy Services Department, Europe and Central Asia Region, June.

Yi-Chong, Xu (2004), *Electricity Reform in China, India and Russia: The World Bank Template and the Politics of Power*, Northampton, MA: Edward Elgar.

Table 1 – Structure of regional markets

Company	Technology	Capacity	Capacity share	Cumulative capacity share	HHI
The Volga Region					
Tatenergo	CHP/GRES/hydro	6,986.00	29.61%	29.61%	876.65
TGK-7	CHP/GRES	5,800.70	24.58%	54.19%	604.41
Hydro OGK	hydro	5,007.00	21.22%	75.41%	450.33
RosAtom	nuclear	4,000.00	16.95%	92.37%	287.40
TGK-5	CHP	1,047.00	4.44%	96.80%	19.69
TGK-6	CHP	754.00	3.20%	100.00%	10.21
Total		23,594.70	100.00%		2,248.70
The Central Region					
RosAtom	nuclear	10,800.00	21.85%	21.85%	477.22
TGK-3	GRES/CHP	10,588.80	21.42%	43.26%	458.74
OGK-3	GRES	5,025.00	10.16%	53.43%	103.31
Hydro OGK	hydro	4,701.00	9.51%	62.94%	90.42
OGK-6	GRES	3,580.00	7.24%	70.18%	52.44
TGK-4	GRES/CHP	3,185.40	6.44%	76.62%	41.51
OGK-5	GRES	2,400.00	4.85%	81.48%	23.57
TGK-6	GRES/CHP	2,361.00	4.78%	86.25%	22.81
TGK-8	GRES/CHP	1,981.00	4.01%	90.26%	16.06
OGK-1	GRES	1,885.00	3.81%	94.07%	14.54
OGK-4	GRES	1,730.00	3.50%	97.57%	12.25
TGK-2	CHP	1,201.00	2.43%	100.00%	5.90
Total		49,438.20	100.00%		1,318.76
The Northwest Region					
TGK-1	GRES/CHP/hydro	6,065.05	34.09%	34.09%	1,161.83
RosAtom	nuclear	5,760.00	32.37%	66.46%	1,047.90
OGK-6	GRES	2,100.00	11.80%	78.26%	139.29
TGK-2	CHP	1,238.50	6.96%	85.22%	48.45
OGK-3	GRES	1,060.00	5.96%	91.18%	35.49
TGK-9	CHP	690.00	3.88%	95.05%	15.04
North-West CHP	CHP	450.00	2.53%	97.58%	6.40
OGK-2	GRES	430.00	2.42%	100.00%	5.84
Total		17,793.55	100.00%		2,460.23
The Siberia Region					
Irkutskenergo	hydro/CHP	12,975.90	27.14%	27.14%	736.78
Hydro OGK	hydro	10,176.00	21.29%	48.43%	453.12
Krasnoyarskaya GES	hydro	6,000.00	12.55%	60.98%	157.53
TGK-11	GRES/CHP	4,526.00	9.47%	70.45%	89.64
Novosibirskenergo	CHP	3,112.00	6.51%	76.96%	42.38
TGK-12	GRES/CHP	3,101.20	6.49%	83.45%	42.08
TGK-13	GRES/CHP	2,362.00	4.94%	88.39%	24.41
OGK-3	GRES	1,690.00	3.54%	91.92%	12.50
OGK-4	GRES	1,440.00	3.01%	94.93%	9.07
OGK-6	GRES	1,250.00	2.61%	97.55%	6.84
TGK-14	CHP	1,071.40	2.24%	99.79%	5.02
Mamakanskaya GES	hydro	100.00	0.21%	100.00%	0.04
Total		47,804.50	100.00%		1,579.42
The South Region					
Hydro OG K	hydro	3,067.72	25.83%	25.83%	667.22
OGK-2	GRES	2,400.00	20.21%	46.04%	408.37
OGK-6	GRES	2,245.00	18.90%	64.94%	357.33
TGK-8	CHP/hydro/GRES	1,823.60	15.35%	80.30%	235.77
OGK-5	GRES	1,340.00	11.28%	91.58%	127.31
RosAtom	nuclear	1,000.00	8.42%	100.00%	70.90
Total		11,876.32	100.00%		1,866.90
The Urals Region					
OGK-1	GRES	7,175.00	18.17%	18.17%	330.08
OGK-2	GRES	5,865.00	14.85%	33.02%	220.55
OGK-4	GRES	5,400.00	13.67%	46.69%	186.96
Bashkirenergo	CHP/GRES/hydro	5,113.79	12.95%	59.64%	167.67
OGK-5	GRES	5,005.00	12.67%	72.31%	160.61
TGK-10	CHP/GRES	2,947.00	7.46%	79.78%	55.68

TGK-9	CHP/GRES/hydro	2,556.40	6.47%	86.25%	41.90
Hydro OGK	hydro	1,482.00	3.75%	90.00%	14.08
TGK-5	CHP	1,426.30	3.61%	93.61%	13.04
TGK-7	CHP/hydro	1,040.00	2.63%	96.25%	6.93
OGK 3	GRES	882.00	2.23%	98.48%	4.99
RosAtom	nuclear	600.00	1.52%	100.00%	2.31
Total		39,492.49	100.00%		1,204.82

Note: OGK – Wholesale Generation Company; TGK – Territorial Generation Company; CHP – Combined Heat and Power Plant; GRES – State Regional Power Plant; CCGT – Combined Cycle Gas Turbine; DES – Diesel Power Station; GTS – Geothermal Power Station; GES – Hydro Power Plant.

Table 2 – Seasonal variation in capacities of hydro power plants across regions

Hydro electric power plant	Winter	Spring	Summer	Fall
The Volga Region				
Zhigulevskaya GES	1,661.06	2,300.00	1,819.99	1,819.99
Saratovskaya GES	965.58	1,337.00	1,057.97	1,057.97
Cheboksarskaya GES	989.41	1,370.00	1,084.08	1,084.08
Nizhnekamskaya GES	870.25	1,205.00	953.52	953.52
The Central Region				
Volzhskaya GES	2,123.01	2,541.00	2,125.29	2,125.29
Zagorskaya GAES	1,200.00	1,200.00	1,200.00	1,200.00
Nizhegorodskaya GES	434.46	520.00	434.93	434.93
Rybinskaya GES	275.72	330.00	276.01	276.01
Uglichskaya GES	91.91	110.00	92.00	92.00
Shodnenskaya GES	24.23	29.00	24.26	24.26
Ivan'kovskaya GES	20.89	25.00	20.91	20.91
The Urals Region				
Votkinskaya GES	601.70	1,020.00	799.68	799.68
Kamskaya GES	272.53	462.00	362.21	362.21
Pavlovskaya GES	98.16	166.40	130.46	130.46
Yumaguzinskaya GES	26.55	45.00	35.28	35.28
Irkutskaya GES	17.70	30.00	23.52	23.52
Shirokovskaya GES-7	16.52	28.00	21.95	21.95
The Far East Region				
Zeykaya GES	1,330.00	1,021.99	1,021.99	1,021.99
Bureyskaya GES	2,000.00	1,536.82	1,536.82	1,536.82
Viluykaya GES	680.00	522.52	522.52	522.52
Kolymkaya GES	900.00	691.57	691.57	691.57
The South Region				
Chirkeykaya GES	530.75	728.22	1,100.00	728.22
Irganayskaya GES	386.00	529.62	800.00	529.62
Miatlinskaya GES	106.15	145.64	220.00	145.64
GES-2	96.50	132.40	200.00	132.40
Zelenchukskie GES	77.20	105.92	160.00	105.92
GES-3	41.98	57.60	87.00	57.60
GES-4	36.48	50.05	75.60	50.05
Chiryurtskaya GES	34.74	47.67	72.00	47.67
Aushigerskaya GES	28.95	39.72	60.00	39.72
Sovetskaya GES	28.95	39.72	60.00	39.72
Ezminskaya GES	21.71	29.79	45.00	29.79
GES-1	17.85	24.49	37.00	24.49
Egorlykaya GES	14.48	19.86	30.00	19.86
Baksanskaya GES	12.06	16.55	25.00	16.55
Gizeldonskaya GES	11.19	15.36	23.20	15.36
GAES	19.20	19.20	19.20	19.20
Gergebilskaya GES	8.59	11.78	17.80	11.78
Sengileevskaya GES	7.24	9.93	15.00	9.93
Svystuhinskaya GES	5.65	7.76	11.72	7.76
Dzau GES	4.44	6.09	9.20	6.09
Tsymlyanskaya GES	100.84	138.36	209.00	138.36
Belorechenskaya GES	23.16	31.78	48.00	31.78

Krasnopolyanskaya GES	13.51	18.54	28.00	18.54
The Northwest Region				
Verhne-svirskaya GES	136.98	149.02	160.00	149.02
Nizhne-svirskaya GES	85.61	93.14	100.00	93.14
Svetogorskaya GES	86.04	93.61	100.50	93.61
Lesogorskaya GES	92.46	100.59	108.00	100.59
Hydro 13 (Ivangorod)	107.02	116.43	125.00	116.43
Hydro 6 (Volkhov)	71.06	77.31	83.00	77.31
Verhnetulomskaya GES	212.32	230.99	248.00	230.99
Nizhnetulomskaya GES	42.81	46.57	50.00	46.57
Serebryanskaya GES-1	172.08	187.21	201.00	187.21
Serebryanskaya GES-2	128.42	139.71	150.00	139.71
Niva-1 GES	22.26	24.22	26.00	24.22
Niva-2 GES	51.37	55.88	60.00	55.88
Niva-3 GES	131.84	143.44	154.00	143.44
Verhneteterberskaya GES	111.30	121.08	130.00	121.08
Nizhneteterberskaya GES	22.69	24.68	26.50	24.68
Kumskaya GES	82.19	89.41	96.00	89.41
Iovskaya GES	82.19	89.41	96.00	89.41
Knyazhegubskaya GES	123.28	134.12	144.00	134.12
Kaytakoski GES	9.59	10.43	11.20	10.43
Yaniskoski GES	26.15	28.45	30.55	28.45
Rayakoski GES	36.98	40.24	43.20	40.24
Hevaskoski GES	40.24	43.78	47.00	43.78
Borisoglebskaya GES	47.94	52.16	56.00	52.16
Ushkozerskaya GES	15.41	16.77	18.00	16.77
Krivoporozhskaya GES	154.10	167.65	180.00	167.65
Poduzhenskaya GES	41.09	44.71	48.00	44.71
Putinskaya GES	71.91	78.24	84.00	78.24
Ondskaya GES	68.49	74.51	80.00	74.51
Palokogorskaya GES	25.68	27.94	30.00	27.94
Matkozhnenskaya GES	53.94	58.68	63.00	58.68
Vygostrovskaya GES	34.25	37.26	40.00	37.26
Belomorskaya GES	23.12	25.15	27.00	25.15
Paleozerskaya GES	21.40	23.29	25.00	23.29
Kondopozhskaya GES	21.92	23.84	25.60	23.84
The Siberia Region				
Sayano-Shushenskaya GES	5,966.90	6,120.14	6,721.00	6,120.14
Boguchanskaya GES	2,663.40	2,731.80	3,000.00	2,731.80
Novosibirskaya GES	403.95	414.32	455.00	414.32
Bratskaya GES	3,995.10	4,097.70	4,500.00	4,097.70
Ust'-Ilimskaya GES	3,409.15	3,496.70	3,840.00	3,496.70
Irkutskaya GES	588.08	603.18	662.40	603.18
Krasnoyarsk GES	5,326.80	5,463.60	6,000.00	5,463.60
Mamakanskaya GES	88.80	91.00	100.00	91.00
Enashiminskaya GES	3.55	3.64	4.00	3.64

Note: GAES – Storage Power Plant. Capacities for storage plants are not seasonally updated because of the specific character of technology they use.

Table 3.1S – Market structure of the Volga region during the spring season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Zhigulevskaya GES (F)		Hydro OGK	hydro	2,300.0	9.75%	9.75%
Saratovskaya GES (NF)		Hydro OGK	hydro	1,337.0	5.67%	15.41%
Cheboksarskaya GES (F)		Hydro OGK	hydro	1,370.0	5.81%	21.22%
Balakovskaya NPP		RosAtom	nuclear	4,000.0	16.95%	38.17%
Nizhnekamskaya GES (F)	Tatenergo	Tatenergo	hydro	1,205.0	5.11%	43.28%
Non-base-load group						
CHP Volzhskogo Avtozavoda	Samaraenergo	TGK-7	CHP	1,172.0	4.97%	48.25%
Tolyattinskaya CHP	Samaraenergo	TGK-7	CHP	710.0	3.01%	51.26%
Novokuybyshevskaya CHP-2	Samaraenergo	TGK-7	CHP	470.0	1.99%	53.25%
Balakovskaya CHP-4	Saratovenergo	TGK-7	CHP	465.0	1.97%	55.22%
Saratovskaya CHP-5	Saratovenergo	TGK-7	CHP	440.0	1.86%	57.08%
Ulyanovskaya CHP-1	Ulyanovskenergo	TGK-7	CHP	435.0	1.84%	58.93%

Ulyanovskaya CHP-2	Ulyanovskenergo	TGK-7	CHP	417.0	1.77%	60.70%
Samarskaya CHP	Samaraenergo	TGK-7	CHP	390.0	1.65%	62.35%
Saratovskaya CHP-2	Saratovenergo	TGK-7	CHP	315.0	1.34%	63.68%
Syzranskaya CHP	Samaraenergo	TGK-7	CHP	255.0	1.08%	64.76%
Novokuybyshevskaya CHP-1	Samaraenergo	TGK-7	CHP	236.0	1.00%	65.76%
Engelsskaya CHP-3	Saratovenergo	TGK-7	CHP	202.0	0.86%	66.62%
Bezymyanskaya CHP	Samaraenergo	TGK-7	CHP	183.7	0.78%	67.40%
Saratovskaya GRES-CHP-1	Saratovenergo	TGK-7	CHP	57.0	0.24%	67.64%
Samarskaya GRES	Samaraenergo	TGK-7	GRES	53.0	0.22%	67.87%
Zainskaya GRES	Tatenergo	Tatenergo	GRES	2,400.0	10.17%	78.04%
Naberezhno-Chelninskaya CHP	Tatenergo	Tatenergo	CHP	1,180.0	5.00%	83.04%
Nizhnekamskaya CHP-1	Tatenergo	Tatenergo	CHP	850.0	3.60%	86.64%
Nizhnekamskaya CHP-2	Tatenergo	Tatenergo	CHP	420.0	1.78%	88.42%
Kazanskaya CHP-3	Tatenergo	Tatenergo	CHP	405.0	1.72%	90.14%
Kazanskaya CHP-1	Tatenergo	Tatenergo	CHP	190.0	0.81%	90.94%
Kazanskaya CHP-2	Tatenergo	Tatenergo	CHP	175.0	0.74%	91.68%
Urussinskaya GRES	Tatenergo	Tatenergo	GRES	161.0	0.68%	92.37%
Cheboksarskaya CHP-2	Chuvashenergo	TGK-5	CHP	460.0	1.95%	94.32%
Novocheboksarskaya CHP-3	Chuvashenergo	TGK-5	CHP	380.0	1.61%	95.93%
Yoshkar-Olinskaya CHP	Marienergo	TGK-5	CHP	195.0	0.83%	96.75%
Cheboksarskaya CHP-1	Chuvashenergo	TGK-5	CHP	12.0	0.05%	96.80%
CHP-1	Penzaenergo	TGK-6	CHP	385.0	1.63%	98.44%
Saranskaya CHP-2	Mordovenergo	TGK-6	CHP	340.0	1.44%	99.88%
CHP-2	Penzaenergo	TGK-6	CHP	16.0	0.07%	99.94%
Alekseevskaya CHP-3	Mordovenergo	TGK-6	CHP	9.0	0.04%	99.98%
CHP-3	Penzaenergo	TGK-6	CHP	4.0	0.02%	100.00%

Source: Annual reports of AO-energos and Federal power plants.

Note: All hydro power plants marked either F or NF. F stands for flexible plant while NF – for non-flexible. Flexibility is defined in terms of plant's constant ability to cover peaks of demand for electric power.

Table 3.1F – Market structure of the Volga region during summer and fall seasons

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Balakovskaya NPP		RosAtom	nuclear	4,000.0	17.94%	17.94%
Saratovskaya GES (NF)		Hydro OGK	hydro	1,058.0	4.74%	22.68%
Non-baseload group						
Zhigulevskaya GES (F)		Hydro OGK	hydro	1,820.0	8.16%	30.85%
Cheboksarskaya GES (F)		Hydro OGK	hydro	1,084.1	4.86%	35.71%
Zainskaya GRES	Tatenergo	Tatenergo	GRES	2,400.0	10.76%	46.47%
Naberezhno-Chelninskaya CHP	Tatenergo	Tatenergo	CHP	1,180.0	5.29%	51.76%
Nizhnekamskaya GES (F)	Tatenergo	Tatenergo	hydro	953.5	4.28%	56.04%
Nizhnekamskaya CHP-1	Tatenergo	Tatenergo	CHP	850.0	3.81%	59.85%
Nizhnekamskaya CHP-2	Tatenergo	Tatenergo	CHP	420.0	1.88%	61.73%
Kazanskaya CHP-3	Tatenergo	Tatenergo	CHP	405.0	1.82%	63.55%
Kazanskaya CHP-1	Tatenergo	Tatenergo	CHP	190.0	0.85%	64.40%
Kazanskaya CHP-2	Tatenergo	Tatenergo	CHP	175.0	0.78%	65.19%
Urussinskaya GRES	Tatenergo	Tatenergo	GRES	161.0	0.72%	65.91%
CHP Volzhskogo Avtozavoda	Samaraenergo	TGK-7	CHP	1,172.0	5.26%	71.17%
Tolyattinskaya CHP	Samaraenergo	TGK-7	CHP	710.0	3.18%	74.35%
Novokuybyshevskaya CHP-2	Samaraenergo	TGK-7	CHP	470.0	2.11%	76.46%
Balakovskaya CHP-4	Saratovenergo	TGK-7	CHP	465.0	2.09%	78.54%
Saratovskaya CHP-5	Saratovenergo	TGK-7	CHP	440.0	1.97%	80.52%
Ulyanovskaya CHP-1	Ulyanovskenergo	TGK-7	CHP	435.0	1.95%	82.47%
Ulyanovskaya CHP-2	Ulyanovskenergo	TGK-7	CHP	417.0	1.87%	84.34%
Samarskaya CHP	Samaraenergo	TGK-7	CHP	390.0	1.75%	86.09%
Saratovskaya CHP-2	Saratovenergo	TGK-7	CHP	315.0	1.41%	87.50%
Syzranskaya CHP	Samaraenergo	TGK-7	CHP	255.0	1.14%	88.64%
Novokuybyshevskaya CHP-1	Samaraenergo	TGK-7	CHP	236.0	1.06%	89.70%
Engelsskaya CHP-3	Saratovenergo	TGK-7	CHP	202.0	0.91%	90.61%
Bezymyanskaya CHP	Samaraenergo	TGK-7	CHP	183.7	0.82%	91.43%
Saratovskaya GRES-CHP-1	Saratovenergo	TGK-7	CHP	57.0	0.26%	91.69%
Samarskaya GRES	Samaraenergo	TGK-7	GRES	53.0	0.24%	91.92%
Cheboksarskaya CHP-2	Chuvashenergo	TGK-5	CHP	460.0	2.06%	93.99%
Novocheboksarskaya CHP-3	Chuvashenergo	TGK-5	CHP	380.0	1.70%	95.69%
Yoshkar-Olinskaya CHP	Marienergo	TGK-5	CHP	195.0	0.87%	96.56%
Cheboksarskaya CHP-1	Chuvashenergo	TGK-5	CHP	12.0	0.05%	96.62%

CHP-1	Penzaenergo	TGK-6	CHP	385.0	1.73%	98.35%
Saranskaya CHP-2	Mordovenergo	TGK-6	CHP	340.0	1.52%	99.87%
CHP-2	Penzaenergo	TGK-6	CHP	16.0	0.07%	99.94%
Alekseevskaya CHP-3	Mordovenergo	TGK-6	CHP	9.0	0.04%	99.98%
CHP-3	Penzaenergo	TGK-6	CHP	4.0	0.02%	100.00%

Table 3.1W – Market structure of the Volga region during the winter season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
CHP Volzhskogo Avtozavoda	SamaraEnergo	TGK-7	CHP	1,172.0	5.36%	5.36%
Tolyattinskaya CHP	SamaraEnergo	TGK-7	CHP	710.0	3.25%	8.61%
Novokuybyshevskaya CHP-2	SamaraEnergo	TGK-7	CHP	470.0	2.15%	10.75%
Balakovskaya CHP-4	SaratovEnergo	TGK-7	CHP	465.0	2.13%	12.88%
Saratovskaya CHP-5	SaratovEnergo	TGK-7	CHP	440.0	2.01%	14.89%
Ulyanovskaya CHP-1	UlyanovskEnergo	TGK-7	CHP	435.0	1.99%	16.88%
Ulyanovskaya CHP-2	UlyanovskEnergo	TGK-7	CHP	417.0	1.91%	18.79%
Samarskaya CHP	SamaraEnergo	TGK-7	CHP	390.0	1.78%	20.57%
Saratovskaya CHP-2	SaratovEnergo	TGK-7	CHP	315.0	1.44%	22.01%
Syzranskaya CHP	SamaraEnergo	TGK-7	CHP	255.0	1.17%	23.18%
Novokuybyshevskaya CHP-1	SamaraEnergo	TGK-7	CHP	236.0	1.08%	24.26%
Engelsskaya CHP-3	SaratovEnergo	TGK-7	CHP	202.0	0.92%	25.18%
Bezmyanskaya CHP	SamaraEnergo	TGK-7	CHP	183.7	0.84%	26.02%
Saratovskaya GRES-CHP-1	SaratovEnergo	TGK-7	CHP	57.0	0.26%	26.28%
Balakovskaya NPP		RosAtom	nuclear	4,000.0	18.29%	44.57%
Naberezhno-Chelninskaya CHP	Tatenergo	Tatenergo	CHP	1,180.0	5.40%	49.97%
Nizhnekamskaya CHP-1	Tatenergo	Tatenergo	CHP	850.0	3.89%	53.86%
Nizhnekamskaya CHP-2	Tatenergo	Tatenergo	CHP	420.0	1.92%	55.78%
Kazanskaya CHP-3	Tatenergo	Tatenergo	CHP	405.0	1.85%	57.63%
Kazanskaya CHP-1	Tatenergo	Tatenergo	CHP	190.0	0.87%	58.50%
Kazanskaya CHP-2	Tatenergo	Tatenergo	CHP	175.0	0.80%	59.30%
Saratovskaya GES (NF)		Hydro OGK	hydro	965.6	4.42%	63.71%
Cheboksarskaya CHP-2	ChuvashEnergo	TGK-5	CHP	460.0	2.10%	65.82%
Novocheboksarskaya CHP-3	ChuvashEnergo	TGK-5	CHP	380.0	1.74%	67.55%
Yoshkar-Olinskaya CHP	MariEnergo	TGK-5	CHP	195.0	0.89%	68.45%
Cheboksarskaya CHP-1	ChuvashEnergo	TGK-5	CHP	12.0	0.05%	68.50%
CHP-1	PenzaEnergo	TGK-6	CHP	385.0	1.76%	70.26%
Saranskaya CHP-2	MordovEnergo	TGK-6	CHP	340.0	1.55%	71.82%
CHP-2	PenzaEnergo	TGK-6	CHP	16.0	0.07%	71.89%
Alekseevskaya CHP-3	MordovEnergo	TGK-6	CHP	9.0	0.04%	71.93%
CHP-3	PenzaEnergo	TGK-6	CHP	4.0	0.02%	71.95%
Non-base-load group						
Zhigulevskaya GES (F)		Hydro OGK	hydro	1,661.1	7.60%	79.54%
Cheboksarskaya GES (F)		Hydro OGK	hydro	989.4	4.52%	84.07%
Zainskaya GRES	Tatenergo	Tatenergo	GRES	2,400.0	10.97%	95.04%
Nizhnekamskaya GES (F)	Tatenergo	Tatenergo	hydro	870.3	3.98%	99.02%
Urussinskaya GRES	Tatenergo	Tatenergo	GRES	161.0	0.74%	99.76%
Samarskaya GRES	SamaraEnergo	TGK-7	GRES	53.0	0.24%	100.00%

Table 3.2S – Market structure of the Central region during the spring season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Kurskaya NPP		RosAtom	nuclear	4,000.0	8.08%	8.08%
Smolenskaya NPP		RosAtom	nuclear	3,000.0	6.06%	14.14%
Kalininskaya NPP		RosAtom	nuclear	2,000.0	4.04%	18.18%
Novovoronezhskaya NPP		RosAtom	nuclear	1,800.0	3.64%	21.82%
Volzhskaya GES (F)		Hydro OGK	hydro	2,541.0	5.13%	26.96%
Zagorskaya GAES (F)		Hydro OGK	hydro	1,200.0	2.42%	29.38%
Nizhegorodskaya GES (F)		Hydro OGK	hydro	520.0	1.05%	30.43%
Rybinskaya GES (F)		Hydro OGK	hydro	330.0	0.67%	31.10%

Uglichskaya GES (F)		Hydro OGG	hydro	110.0	0.22%	31.32%
Shodnenskaya GES (F)		Independent	hydro	29.0	0.06%	31.38%
Ivan'kovskaya GES (F)		Independent	hydro	25.0	0.05%	31.43%
Non-base-load group						
CHP-23	Mosenergo	TGK-3	CHP	1,410.0	2.85%	34.28%
CHP-26	Mosenergo	TGK-3	CHP	1,410.0	2.85%	37.13%
CHP-25	Mosenergo	TGK-3	CHP	1,370.0	2.77%	39.90%
CHP-21	Mosenergo	TGK-3	CHP	1,340.0	2.71%	42.60%
CHP-22	Mosenergo	TGK-3	CHP	1,300.0	2.63%	45.23%
CHP-20	Mosenergo	TGK-3	CHP	705.0	1.42%	46.65%
GRES-3 im.Klassona	Mosenergo	TGK-3	GRES	627.1	1.27%	47.92%
CHP-8	Mosenergo	TGK-3	CHP	605.0	1.22%	49.14%
CHP-12	Mosenergo	TGK-3	CHP	408.0	0.82%	49.97%
CHP-16	Mosenergo	TGK-3	CHP	360.0	0.73%	50.70%
CHP-11	Mosenergo	TGK-3	CHP	330.0	0.67%	51.36%
CHP-9	Mosenergo	TGK-3	CHP	250.0	0.51%	51.87%
CHP-17	Mosenergo	TGK-3	CHP	192.0	0.39%	52.25%
CHP-27	Mosenergo	TGK-3	CHP	160.0	0.32%	52.58%
CHP-1 im.Smidovicha	Mosenergo	TGK-3	CHP	72.7	0.15%	52.73%
CHP-28	Mosenergo	TGK-3	CHP	25.0	0.05%	52.78%
CHP-6	Mosenergo	TGK-3	CHP	24.0	0.05%	52.82%
Kostromskaya GRES		OGK-3	GRES	3,600.0	7.27%	60.10%
Cherepetskaya GRES		OGK-3	GRES	1,425.0	2.88%	62.98%
Ryazanskaya GRES		OGK-6	GRES	2,640.0	5.33%	68.31%
Cherepovetskaya GRES		OGK-6	GRES	630.0	1.27%	69.58%
GRES-24		OGK-6	GRES	310.0	0.63%	70.21%
CHP-2	Lipeckenergo	TGK-4	CHP	515.0	1.04%	71.25%
Schekinskaya GRES	Tulenergo	TGK-4	GRES	400.0	0.81%	72.06%
Orel CHP	Orelenergo	TGK-4	CHP	330.0	0.67%	72.73%
Smolensk CHP-2	Smolenskenergo	TGK-4	CHP	275.0	0.56%	73.28%
Novomoskovskaya GRES	Tulenergo	TGK-4	GRES	261.0	0.53%	73.81%
Tambovskaya CHP	Tambovenergo	TGK-4	CHP	235.0	0.47%	74.28%
Kurskaya CHP-1	Kurskenergo	TGK-4	CHP	192.0	0.39%	74.67%
Efremovskaya CHP	Tulenergo	TGK-4	CHP	160.0	0.32%	75.00%
Dorogobuzhskaya CHP	Smolenskenergo	TGK-4	CHP	137.0	0.28%	75.27%
VoronezhEnergo	Voronezhenergo	TGK-4	CHP	115.0	0.23%	75.50%
Pervomayskaya CHP	Tulenergo	TGK-4	CHP	105.0	0.21%	75.72%
Aleksinskaya CHP	Tulenergo	TGK-4	CHP	102.0	0.21%	75.92%
Dyagilevskaya CHP	Ryazanenergo	TGK-4	CHP	100.0	0.20%	76.12%
Kotovskaya CHP	Tambovenergo	TGK-4	CHP	80.0	0.16%	76.29%
Gubkinskaya CHP	Belgorodenergo	TGK-4	CHP	46.0	0.09%	76.38%
Bryanskaya GRES	Bryanskenergo	TGK-4	GRES	38.0	0.08%	76.46%
Belgorodskaya CHP	Belgorodenergo	TGK-4	CHP	25.6	0.05%	76.51%
Eletskaya CHP	Lipeckenergo	TGK-4	CHP	18.0	0.04%	76.54%
Klintsovskaya CHP	Bryanskenergo	TGK-4	CHP	12.0	0.02%	76.57%
Kaluzhskaya CHP-1	Kalugaenergo	TGK-4	CHP	12.0	0.02%	76.59%
Livenskaya CHP	Orelenergo	TGK-4	CHP	12.0	0.02%	76.62%
Dankovskaya CHP	Lipeckenergo	TGK-4	CHP	10.0	0.02%	76.64%
Kurskaya CHP-4	Kurskenergo	TGK-4	CHP	4.8	0.01%	76.65%
Konakovskaya GRES		OGK-5	GRES	2,400.0	4.85%	81.50%
Dzerzhinskaya CHP	Nizhnovenergo	TGK-6	CHP	435.0	0.88%	82.38%
Vladimirskaia CHP	Vladimirenergo	TGK-6	CHP	407.0	0.82%	83.20%
Sormovskaya CHP	Nizhnovenergo	TGK-6	CHP	340.0	0.69%	83.88%
Ivanovskaya CHP-3	Ivenergo	TGK-6	CHP	330.0	0.67%	84.55%
Novogorkovskaya CHP	Nizhnovenergo	TGK-6	CHP	265.0	0.54%	85.09%
Ivanovskaya CHP-2	Ivenergo	TGK-6	CHP	181.0	0.37%	85.45%
Ivanovskaya GRES	Ivenergo	TGK-6	GRES	172.0	0.35%	85.80%
Nizhegorodskaya GRES	Nizhnovenergo	TGK-6	GRES	144.0	0.29%	86.09%
Igumnovskaya CHP	Nizhnovenergo	TGK-6	CHP	87.0	0.18%	86.27%
Volzhskaya CHP-1	Volgogradenergo	TGK-8	CHP	541.0	1.09%	87.36%
Astrahanskaya CHP-2	Astrahanenergo	TGK-8	CHP	380.0	0.77%	88.13%
Volgogradskaya CHP-2	Volgogradenergo	TGK-8	CHP	300.0	0.61%	88.73%
Volgogradskaya CHP-3	Volgogradenergo	TGK-8	CHP	296.0	0.60%	89.33%
Volzhskaya CHP-2	Volgogradenergo	TGK-8	CHP	220.0	0.44%	89.78%
Astrahanskaya GRES	Astrahanenergo	TGK-8	GRES	100.0	0.20%	89.98%
Volgogradskaya GRES	Volgogradenergo	TGK-8	GRES	72.0	0.15%	90.12%
Kamyshinskaya CHP	Volgogradenergo	TGK-8	CHP	72.0	0.15%	90.27%
Kashirskaya GRES-4		OGK-1	GRES	1,885.0	3.81%	94.08%
Shaturskaya GRES-5		OGK-4	GRES	1,100.0	2.22%	96.30%
Smolenskaya GRES		OGK-4	GRES	630.0	1.27%	97.57%

CHP-3	Yarenergo	TGK-2	CHP	320.0	0.65%	98.22%
KostromaEnergo	Kostromaenergo	TGK-2	CHP	215.0	0.43%	98.65%
CHP-2	Yarenergo	TGK-2	CHP	210.0	0.42%	99.08%
Tverskaya CHP-3	Tverenergo	TGK-2	CHP	170.0	0.34%	99.42%
CHP-1	Yarenergo	TGK-2	CHP	130.0	0.26%	99.68%
Kalininskaya CHP-4	Tverenergo	TGK-2	CHP	105.0	0.21%	99.90%
Vologodskaya CHP	Vologdaenergo	TGK-2	CHP	34.0	0.07%	99.97%
Tverskaya CHP-1	Tverenergo	TGK-2	CHP	17.0	0.03%	100.00%

Table 3.2F – Market structure of the Central region during summer and fall seasons

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Kurskaya NPP		RosAtom	nuclear	4,000.0	8.18%	8.18%
Smolenskaya NPP		RosAtom	nuclear	3,000.0	6.13%	14.31%
Kalininskaya NPP		RosAtom	nuclear	2,000.0	4.09%	18.40%
Novovoronezhskaya NPP		RosAtom	nuclear	1,800.0	3.68%	22.08%
Non-base-load group						
Volzhskaya GES (F)		Hydro OGK	hydro	2,125.3	4.35%	26.43%
Zagorskaya GAES (F)		Hydro OGK	hydro	1,200.0	2.45%	28.88%
Nizhegorodskaya GES (F)		Hydro OGK	hydro	434.9	0.89%	29.77%
Rybinskaya GES (F)		Hydro OGK	hydro	276.0	0.56%	30.33%
Uglichskaya GES (F)		Hydro OGK	hydro	92.0	0.19%	30.52%
CHP-23	Mosenergo	TGK-3	CHP	1,410.0	2.88%	33.40%
CHP-26	Mosenergo	TGK-3	CHP	1,410.0	2.88%	36.29%
CHP-25	Mosenergo	TGK-3	CHP	1,370.0	2.80%	39.09%
CHP-21	Mosenergo	TGK-3	CHP	1,340.0	2.74%	41.83%
CHP-22	Mosenergo	TGK-3	CHP	1,300.0	2.66%	44.49%
CHP-20	Mosenergo	TGK-3	CHP	705.0	1.44%	45.93%
GRES-3 im.Klassona	Mosenergo	TGK-3	GRES	627.1	1.28%	47.21%
CHP-8	Mosenergo	TGK-3	CHP	605.0	1.24%	48.45%
CHP-12	Mosenergo	TGK-3	CHP	408.0	0.83%	49.28%
CHP-16	Mosenergo	TGK-3	CHP	360.0	0.74%	50.02%
CHP-11	Mosenergo	TGK-3	CHP	330.0	0.67%	50.69%
CHP-9	Mosenergo	TGK-3	CHP	250.0	0.51%	51.20%
CHP-17	Mosenergo	TGK-3	CHP	192.0	0.39%	51.59%
CHP-27	Mosenergo	TGK-3	CHP	160.0	0.33%	51.92%
CHP-1 im.Smidovicha	Mosenergo	TGK-3	CHP	72.7	0.15%	52.07%
CHP-28	Mosenergo	TGK-3	CHP	25.0	0.05%	52.12%
CHP-6	Mosenergo	TGK-3	CHP	24.0	0.05%	52.17%
Kostromskaya GRES		OGK-3	GRES	3,600.0	7.36%	59.53%
Cherepetskaya GRES		OGK-3	GRES	1,425.0	2.91%	62.44%
Ryazanskaya GRES		OGK-6	GRES	2,640.0	5.40%	67.84%
Cherepovetskaya GRES		OGK-6	GRES	630.0	1.29%	69.13%
GRES-24		OGK-6	GRES	310.0	0.63%	69.76%
CHP-2	Lipeckenergo	TGK-4	CHP	515.0	1.05%	70.82%
Schekinskaya GRES	Tulenergo	TGK-4	GRES	400.0	0.82%	71.63%
Orel CHP	Orelenergo	TGK-4	CHP	330.0	0.67%	72.31%
Smolensk CHP-2	Smolenskenergo	TGK-4	CHP	275.0	0.56%	72.87%
Novomoskovskaya GRES	Tulenergo	TGK-4	GRES	261.0	0.53%	73.41%
Tambovskaya CHP	Tambovenergo	TGK-4	CHP	235.0	0.48%	73.89%
Kurskaya CHP-1	Kurskenergo	TGK-4	CHP	192.0	0.39%	74.28%
Efremovskaya CHP	Tulenergo	TGK-4	CHP	160.0	0.33%	74.61%
Dorogobuzhskaya CHP	Smolenskenergo	TGK-4	CHP	137.0	0.28%	74.89%
VoronezhEnergo	Voronezhenergo	TGK-4	CHP	115.0	0.24%	75.12%
Pervomayskaya CHP	Tulenergo	TGK-4	CHP	105.0	0.21%	75.34%
Aleksinskaya CHP	Tulenergo	TGK-4	CHP	102.0	0.21%	75.54%
Dyagilevskaya CHP	Ryazanenergo	TGK-4	CHP	100.0	0.20%	75.75%
Kotovskaya CHP	Tambovenergo	TGK-4	CHP	80.0	0.16%	75.91%
Gubkinskaya CHP	Belgorodenergo	TGK-4	CHP	46.0	0.09%	76.01%
Bryanskaya GRES	Bryanskenergo	TGK-4	GRES	38.0	0.08%	76.08%
Belgorodskaya CHP	Belgorodenergo	TGK-4	CHP	25.6	0.05%	76.14%
Eletskeya CHP	Lipeckenergo	TGK-4	CHP	18.0	0.04%	76.17%
Klintsovskaya CHP	Bryanskenergo	TGK-4	CHP	12.0	0.02%	76.20%
Kaluzhskaya CHP-1	Kalugaenergo	TGK-4	CHP	12.0	0.02%	76.22%
Livenskaya CHP	Orelenergo	TGK-4	CHP	12.0	0.02%	76.25%
Dankovskaya CHP	Lipeckenergo	TGK-4	CHP	10.0	0.02%	76.27%

Kurskaya CHP-4	Kurskenergo	TGK-4	CHP	4.8	0.01%	76.28%
Konakovskaya GRES		OGK-5	GRES	2,400.0	4.91%	81.18%
Dzerzhinskaya CHP	Nizhnovenergo	TGK-6	CHP	435.0	0.89%	82.07%
Vladimirskaia CHP	Vladimirenergo	TGK-6	CHP	407.0	0.83%	82.91%
Sormovskaya CHP	Nizhnovenergo	TGK-6	CHP	340.0	0.70%	83.60%
Ivanovskaya CHP-3	Ivenergo	TGK-6	CHP	330.0	0.67%	84.28%
Novogorkovskaya CHP	Nizhnovenergo	TGK-6	CHP	265.0	0.54%	84.82%
Ivanovskaya CHP-2	Ivenergo	TGK-6	CHP	181.0	0.37%	85.19%
Ivanovskaya GRES	Ivenergo	TGK-6	GRES	172.0	0.35%	85.54%
Nizhegorodskaya GRES	Nizhnovenergo	TGK-6	GRES	144.0	0.29%	85.83%
Igumnovskaya CHP	Nizhnovenergo	TGK-6	CHP	87.0	0.18%	86.01%
Volzhskaya CHP-1	Volgogradenergo	TGK-8	CHP	541.0	1.11%	87.12%
Astrahanskaya CHP-2	Astrahanenergo	TGK-8	CHP	380.0	0.78%	87.89%
Volgogradskaya CHP-2	Volgogradenergo	TGK-8	CHP	300.0	0.61%	88.51%
Volgogradskaya CHP-3	Volgogradenergo	TGK-8	CHP	296.0	0.61%	89.11%
Volzhskaya CHP-2	Volgogradenergo	TGK-8	CHP	220.0	0.45%	89.56%
Astrahanskaya GRES	Astrahanenergo	TGK-8	GRES	100.0	0.20%	89.77%
Volgogradskaya GRES	Volgogradenergo	TGK-8	GRES	72.0	0.15%	89.91%
Kamyshinskaya CHP	Volgogradenergo	TGK-8	CHP	72.0	0.15%	90.06%
Kashirskaya GRES-4		OGK-1	GRES	1,885.0	3.85%	93.92%
Shaturskaya GRES-5		OGK-4	GRES	1,100.0	2.25%	96.16%
Smolenskaya GRES		OGK-4	GRES	630.0	1.29%	97.45%
CHP-3	Yarenergo	TGK-2	CHP	320.0	0.65%	98.11%
KostromaEnergo	Kostromaenergo	TGK-2	CHP	215.0	0.44%	98.55%
CHP-2	Yarenergo	TGK-2	CHP	210.0	0.43%	98.98%
Tverskaya CHP-3	Tverenergo	TGK-2	CHP	170.0	0.35%	99.32%
CHP-1	Yarenergo	TGK-2	CHP	130.0	0.27%	99.59%
Kalininskaya CHP-4	Tverenergo	TGK-2	CHP	105.0	0.21%	99.80%
Vologodskaya CHP	Vologdaenergo	TGK-2	CHP	34.0	0.07%	99.87%
Tverskaya CHP-1	Tverenergo	TGK-2	CHP	17.0	0.03%	99.91%
Shodnenskaya GES (F)		Independent	hydro	24.3	0.05%	99.96%
Ivan'kovskaya GES (F)		Independent	hydro	20.9	0.04%	100.00%

Table 3.2W – Market structure of the Central region during the winter season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Kurskaya NPP		RosAtom	nuclear	4,000.0	8.18%	8.18%
Smolenskaya NPP		RosAtom	nuclear	3,000.0	6.13%	14.31%
Kalininskaya NPP		RosAtom	nuclear	2,000.0	4.09%	18.40%
Novovoronezhskaya NPP		RosAtom	nuclear	1,800.0	3.68%	22.08%
CHP-23	Mosenergo	TGK-3	CHP	1,410.0	2.88%	24.97%
CHP-26	Mosenergo	TGK-3	CHP	1,410.0	2.88%	27.85%
CHP-25	Mosenergo	TGK-3	CHP	1,370.0	2.80%	30.65%
CHP-21	Mosenergo	TGK-3	CHP	1,340.0	2.74%	33.39%
CHP-22	Mosenergo	TGK-3	CHP	1,300.0	2.66%	36.05%
CHP-20	Mosenergo	TGK-3	CHP	705.0	1.44%	37.49%
CHP-8	Mosenergo	TGK-3	CHP	605.0	1.24%	38.73%
CHP-12	Mosenergo	TGK-3	CHP	408.0	0.83%	39.56%
CHP-16	Mosenergo	TGK-3	CHP	360.0	0.74%	40.30%
CHP-11	Mosenergo	TGK-3	CHP	330.0	0.67%	40.97%
CHP-9	Mosenergo	TGK-3	CHP	250.0	0.51%	41.48%
CHP-17	Mosenergo	TGK-3	CHP	192.0	0.39%	41.88%
CHP-27	Mosenergo	TGK-3	CHP	160.0	0.33%	42.20%
CHP-1 im.Smidovicha	Mosenergo	TGK-3	CHP	72.7	0.15%	42.35%
CHP-28	Mosenergo	TGK-3	CHP	25.0	0.05%	42.40%
CHP-6	Mosenergo	TGK-3	CHP	24.0	0.05%	42.45%
CHP-2	Lipeckenergo	TGK-4	CHP	515.0	1.05%	43.50%
Orel CHP	Orelenergo	TGK-4	CHP	330.0	0.67%	44.18%
Smolensk CHP-2	Smolenskenergo	TGK-4	CHP	275.0	0.56%	44.74%
Tambovskaya CHP	Tambovenergo	TGK-4	CHP	235.0	0.48%	45.22%
Kurskaya CHP-1	Kurskenergo	TGK-4	CHP	192.0	0.39%	45.61%
efremovskaya CHP	Tulenergo	TGK-4	CHP	160.0	0.33%	45.94%
Dorogobuzhskaya CHP	Smolenskenergo	TGK-4	CHP	137.0	0.28%	46.22%
Voronezhenergo	Voronezhenergo	TGK-4	CHP	115.0	0.24%	46.46%
Pervomayskaya CHP	Tulenergo	TGK-4	CHP	105.0	0.21%	46.67%
Aleksinskaya CHP	Tulenergo	TGK-4	CHP	102.0	0.21%	46.88%

Dyagilevskaya CHP	Ryazanenergo	TGK-4	CHP	100.0	0.20%	47.08%
Kotovskaya CHP	Tambovenergo	TGK-4	CHP	80.0	0.16%	47.25%
Gubkinskaya CHP	Belgorodenergo	TGK-4	CHP	46.0	0.09%	47.34%
Belgorodskaya CHP	Belgorodenergo	TGK-4	CHP	25.6	0.05%	47.39%
eletsckaya CHP	Lipeckenergo	TGK-4	CHP	18.0	0.04%	47.43%
Klintsovskaya CHP	Bryanskenergo	TGK-4	CHP	12.0	0.02%	47.46%
Kaluzhskaya CHP-1	Kalugaenergo	TGK-4	CHP	12.0	0.02%	47.48%
Livenskaya CHP	Orelenergo	TGK-4	CHP	12.0	0.02%	47.50%
Dankovskaya CHP	Lipeckenergo	TGK-4	CHP	10.0	0.02%	47.53%
Kurskaya CHP-4	Kurskenergo	TGK-4	CHP	4.8	0.01%	47.53%
Dzerzhinskaya CHP	Nizhnovenergo	TGK-6	CHP	435.0	0.89%	48.42%
Vladimirsckaya CHP	Vladimirenergo	TGK-6	CHP	407.0	0.83%	49.26%
Sormovskaya CHP	Nizhnovenergo	TGK-6	CHP	340.0	0.70%	49.95%
Ivanovskaya CHP-3	Ivenergo	TGK-6	CHP	330.0	0.67%	50.63%
Novogorkovskaya CHP	Nizhnovenergo	TGK-6	CHP	265.0	0.54%	51.17%
Ivanovskaya CHP-2	Ivenergo	TGK-6	CHP	181.0	0.37%	51.54%
Igumnovskaya CHP	Nizhnovenergo	TGK-6	CHP	87.0	0.18%	51.72%
Volzhskaya CHP-1	Volgogradenergo	TGK-8	CHP	541.0	1.11%	52.82%
Astrahanskaya CHP-2	Astrahanenergo	TGK-8	CHP	380.0	0.78%	53.60%
Volgogradskaya CHP-2	Volgogradenergo	TGK-8	CHP	300.0	0.61%	54.21%
Volgogradskaya CHP-3	Volgogradenergo	TGK-8	CHP	296.0	0.61%	54.82%
Volzhskaya CHP-2	Volgogradenergo	TGK-8	CHP	220.0	0.45%	55.27%
Kamyshinskaya CHP	Volgogradenergo	TGK-8	CHP	72.0	0.15%	55.42%
CHP-3	Yarenergo	TGK-2	CHP	320.0	0.65%	56.07%
Kostromaenergo	Kostromaenergo	TGK-2	CHP	215.0	0.44%	56.51%
CHP-2	Yarenergo	TGK-2	CHP	210.0	0.43%	56.94%
Tverskaya CHP-3	Tverenergo	TGK-2	CHP	170.0	0.35%	57.29%
CHP-1	Yarenergo	TGK-2	CHP	130.0	0.27%	57.55%
Kalininskaya CHP-4	Tverenergo	TGK-2	CHP	105.0	0.21%	57.77%
Vologodskaya CHP	Vologdaenergo	TGK-2	CHP	34.0	0.07%	57.84%
Tverskaya CHP-1	Tverenergo	TGK-2	CHP	17.0	0.03%	57.87%
Non-base-load group						
Volzhskaya GES (F)		Hydro OGK	hydro	2,123.0	4.34%	62.21%
Zagorskaya GAES (F)		Hydro OGK	hydro	1,200.0	2.45%	64.67%
Nizhegorodskaya GES (F)		Hydro OGK	hydro	434.5	0.89%	65.55%
Rybinskaya GES (F)		Hydro OGK	hydro	275.7	0.56%	66.12%
Uglichskaya GES (F)		Hydro OGK	hydro	91.9	0.19%	66.31%
Kostromskaya GRES		OGK-3	GRES	3,600.0	7.36%	73.67%
Cherepetskaya GRES		OGK-3	GRES	1,425.0	2.91%	76.58%
Ryazanskaya GRES		OGK-6	GRES	2,640.0	5.40%	81.98%
Cherepovetskaya GRES		OGK-6	GRES	630.0	1.29%	83.27%
GRES-24		OGK-6	GRES	310.0	0.63%	83.90%
Konakovskaya GRES		OGK-5	GRES	2,400.0	4.91%	88.81%
Kashirskaya GRES-4		OGK-1	GRES	1,885.0	3.85%	92.66%
Shaturskaya GRES-5		OGK-4	GRES	1,100.0	2.25%	94.91%
Smolenskaya GRES		OGK-4	GRES	630.0	1.29%	96.20%
Schekinskaya GRES	Tulenergo	TGK-4	GRES	400.0	0.82%	97.02%
Novomoskovskaya GRES	Tulenergo	TGK-4	GRES	261.0	0.53%	97.55%
Bryanskaya GRES	Bryanskenergo	TGK-4	GRES	38.0	0.08%	97.63%
GRES-3 im.Klassona	Mosenergo	TGK-3	GRES	627.1	1.28%	98.91%
Ivanovskaya GRES	Ivenergo	TGK-6	GRES	172.0	0.35%	99.26%
Nizhegorodskaya GRES	Nizhnovenergo	TGK-6	GRES	144.0	0.29%	99.56%
Astrahanskaya GRES	Astrahanenergo	TGK-8	GRES	100.0	0.20%	99.76%
Volgogradskaya GRES	Volgogradenergo	TGK-8	GRES	72.0	0.15%	99.91%
Shodnenskaya GES (F)		Independent	hydro	24.2	0.05%	99.96%
Ivan'kovskaya GES (F)		Independent	hydro	20.9	0.04%	100.00%

Table 3.3SF – Market structure of the Northwest region during spring and fall seasons

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Leningrad NPP	RosAtom	RosAtom	nuclear	4,000.00	22.72%	22.72%
Kola NPP	RosAtom	RosAtom	nuclear	1,760.00	9.99%	32.71%
Krivopozhskaya GES (NF)	Karelenenergo	TGK-1	hydro	167.65	0.95%	33.66%
Niva-3 GES (NF)	Kolenergo	TGK-1	hydro	143.44	0.81%	34.48%
Serebryanskaya GES-2 (NF)	Kolenergo	TGK-1	hydro	139.71	0.79%	35.27%
Hydro 13 (Ivangorod) (NF)	Lenenergo	TGK-1	hydro	116.43	0.66%	35.93%

Lesogorskaya GES (NF)	Lenenergo	TGK-1	hydro	100.59	0.57%	36.50%
Svetogorskaya GES (NF)	Lenenergo	TGK-1	hydro	93.61	0.53%	37.03%
Nizhne-svirskaya GES (NF)	Lenenergo	TGK-1	hydro	93.14	0.53%	37.56%
Putkinskaya GES (NF)	Karelenergo	TGK-1	hydro	78.24	0.44%	38.01%
Matkozhenskaya GES (NF)	Karelenergo	TGK-1	hydro	58.68	0.33%	38.34%
Niva-2 GES (NF)	Kolenergo	TGK-1	hydro	55.88	0.32%	38.66%
Borisoglebskaya GES (NF)	Kolenergo	TGK-1	hydro	52.16	0.30%	38.95%
Nizhnetulomskaya GES (NF)	Kolenergo	TGK-1	hydro	46.57	0.26%	39.22%
Poduzhenskaya GES (NF)	Karelenergo	TGK-1	hydro	44.71	0.25%	39.47%
Hevaskosky GES (NF)	Kolenergo	TGK-1	hydro	43.78	0.25%	39.72%
Rayakosky GES (NF)	Kolenergo	TGK-1	hydro	40.24	0.23%	39.95%
Vygostrovskaya GES (NF)	Karelenergo	TGK-1	hydro	37.26	0.21%	40.16%
Yaniskoski GES (NF)	Kolenergo	TGK-1	hydro	28.45	0.16%	40.32%
Palokogorskaya GES (NF)	Karelenergo	TGK-1	hydro	27.94	0.16%	40.48%
Belomorskaya GES (NF)	Karelenergo	TGK-1	hydro	25.15	0.14%	40.62%
Nizhneriberskaya GES (NF)	Kolenergo	TGK-1	hydro	24.68	0.14%	40.76%
Non-base-load group						
CHP-22 (SPb)	Lenenergo	TGK-1	CHP	800.00	4.54%	45.31%
CHP-21 (SPb)	Lenenergo	TGK-1	CHP	500.00	2.84%	48.15%
CHP-14 (Spb)	Lenenergo	TGK-1	CHP	330.00	1.87%	50.02%
Apatitskaya CHP	Kolenergo	TGK-1	CHP	323.00	1.83%	51.85%
CHP-15 (SPb)	Lenenergo	TGK-1	CHP	291.00	1.65%	53.51%
Petrozavodskaya CHP	Karelenergo	TGK-1	CHP	280.00	1.59%	55.10%
CHP-17 (SPb)	Lenenergo	TGK-1	CHP	255.00	1.45%	56.55%
Verhnetulomskaya GES (F)	Kolenergo	TGK-1	hydro	230.99	1.31%	57.86%
GRES-8	Lenenergo	TGK-1	GRES	192.00	1.09%	58.95%
Serebryanskaya GES-1	Kolenergo	TGK-1	hydro	187.21	1.06%	60.01%
Verhne-svirskaya GES (F)	Lenenergo	TGK-1	hydro	149.02	0.85%	60.86%
Knyazhegubskaya GES (F)	Kolenergo	TGK-1	hydro	134.12	0.76%	61.62%
Verhneriberskaya GES (F)	Kolenergo	TGK-1	hydro	121.08	0.69%	62.31%
Kumskaya GES (F)	Kolenergo	TGK-1	hydro	89.41	0.51%	62.81%
Iovskaya GES (F)	Kolenergo	TGK-1	hydro	89.41	0.51%	63.32%
CHP-7 (Spb)	Lenenergo	TGK-1	CHP	85.00	0.48%	63.80%
Central CHP	Lenenergo	TGK-1	CHP	78.50	0.45%	64.25%
Hydro 6 (Volkhov) (F)	Lenenergo	TGK-1	hydro	77.31	0.44%	64.69%
Ondskaya GES (F)	Karelenergo	TGK-1	hydro	74.51	0.42%	65.11%
CHP-5 (SPb)	Lenenergo	TGK-1	CHP	64.00	0.36%	65.48%
Niva-1 GES (F)	Kolenergo	TGK-1	hydro	24.22	0.14%	65.61%
Kondopozhskaya GES (F)	Karelenergo	TGK-1	hydro	23.84	0.14%	65.75%
Paleozerskaya GES (F)	Karelenergo	TGK-1	hydro	23.29	0.13%	65.88%
Ushkozerskaya GES (F)	Karelenergo	TGK-1	hydro	16.77	0.10%	65.98%
Kaytakoski GES (F)	Kolenergo	TGK-1	hydro	10.43	0.06%	66.04%
Kirishskaya [Kirishi] GRES		OGK-6	GRES	2,100.00	11.93%	77.96%
Arhangelskaya CHP	Arkhenergo	TGK-2	CHP	450.00	2.56%	80.52%
Severodvinskaya CHP-2	Arkhenergo	TGK-2	CHP	410.00	2.33%	82.84%
Novgorodskaya CHP	Novgorodenergo	TGK-2	CHP	190.00	1.08%	83.92%
Severodvinskaya CHP-1	Arkhenergo	TGK-2	CHP	188.50	1.07%	84.99%
Pechorskaya GRES		OGK-3	GRES	1,060.00	6.02%	91.01%
Sosnogorskaya CHP	Komienergo	TGK-9	CHP	377.00	2.14%	93.15%
Vorkutinskaya CHP-2	Komienergo	TGK-9	CHP	270.00	1.53%	94.69%
Vorkutinskaya CHP-1	Komienergo	TGK-9	CHP	25.00	0.14%	94.83%
Intinskaya CHP	Komienergo	TGK-9	CHP	18.00	0.10%	94.93%
Pskovskaya GRES		OGK-2	GRES	430.00	2.44%	97.37%
North-West CHP		Independent	CHP	450.00	2.56%	99.93%
Pskovskaya CHP	Pskovenergo	Independent	CHP	9.50	0.05%	99.98%
Maksyutinskaya GES	Pskovenergo	Independent	hydro	1.50	0.01%	99.99%
Shilskaya GES	Pskovenergo	Independent	hydro	1.50	0.01%	100.00%

Table 3.3SU – Market structure of the Northwest region during the summer season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Leningrad NPP	RosAtom	RosAtom	nuclear	4,000.0	22.46%	22.46%
Kola NPP	RosAtom	RosAtom	nuclear	1,760.0	9.88%	32.35%
Krivoporozhskaya GES (NF)	Karelenergo	TGK-1	hydro	180.0	1.01%	33.36%
Niva-3 GES (NF)	Kolenergo	TGK-1	hydro	154.0	0.86%	34.22%
Serebryanskaya GES-2 (NF)	Kolenergo	TGK-1	hydro	150.0	0.84%	35.07%

Hydro 13 (Ivangorod) (NF)	Lenenergo	TGK-1	hydro	125.0	0.70%	35.77%
Lesogorskaya GES (NF)	Lenenergo	TGK-1	hydro	108.0	0.61%	36.38%
Svetogorskaya GES (NF)	Lenenergo	TGK-1	hydro	100.5	0.56%	36.94%
Nizhne-svirskaya GES (NF)	Lenenergo	TGK-1	hydro	100.0	0.56%	37.50%
Putkinskaya GES (NF)	Karelenergo	TGK-1	hydro	84.0	0.47%	37.97%
Matkozhenskaya GES (NF)	Karelenergo	TGK-1	hydro	63.0	0.35%	38.33%
Niva-2 GES (NF)	Kolenergo	TGK-1	hydro	60.0	0.34%	38.66%
Borisoglebskaya GES (NF)	Kolenergo	TGK-1	hydro	56.0	0.31%	38.98%
Nizhnetulomskaya GES (NF)	Kolenergo	TGK-1	hydro	50.0	0.28%	39.26%
Poduzhemskaya GES (NF)	Karelenergo	TGK-1	hydro	48.0	0.27%	39.53%
Hevaskosky GES (NF)	Kolenergo	TGK-1	hydro	47.0	0.26%	39.79%
Rayakosky GES (NF)	Kolenergo	TGK-1	hydro	43.2	0.24%	40.04%
Vygostrvskaya GES (NF)	Karelenergo	TGK-1	hydro	40.0	0.22%	40.26%
Yaniskoski GES (NF)	Kolenergo	TGK-1	hydro	30.6	0.17%	40.43%
Palokogorskaya GES (NF)	Karelenergo	TGK-1	hydro	30.0	0.17%	40.60%
Belomorskaya GES (NF)	Karelenergo	TGK-1	hydro	27.0	0.15%	40.75%
Nizhnetriberskaya GES (NF)	Kolenergo	TGK-1	hydro	26.5	0.15%	40.90%
Non-base-load group						
CHP-22 (SPb)	Lenenergo	TGK-1	CHP	800.0	4.49%	45.39%
CHP-21 (SPb)	Lenenergo	TGK-1	CHP	500.0	2.81%	48.20%
CHP-14 (SPb)	Lenenergo	TGK-1	CHP	330.0	1.85%	50.05%
Apatitskaya CHP	Kolenergo	TGK-1	CHP	323.0	1.81%	51.87%
CHP-15 (SPb)	Lenenergo	TGK-1	CHP	291.0	1.63%	53.50%
Petrozavodskaya CHP	Karelenergo	TGK-1	CHP	280.0	1.57%	55.08%
CHP-17 (SPb)	Lenenergo	TGK-1	CHP	255.0	1.43%	56.51%
Verhnetulomskaya GES (F)	Kolenergo	TGK-1	hydro	248.0	1.39%	57.90%
Serebryanskaya GES-1 (F)	Kolenergo	TGK-1	hydro	201.0	1.13%	59.03%
GRES-8	Lenenergo	TGK-1	GRES	192.0	1.08%	60.11%
Verhne-svirskaya GES (F)	Lenenergo	TGK-1	hydro	160.0	0.90%	61.01%
Knyazhegubskaya GES (F)	Kolenergo	TGK-1	hydro	144.0	0.81%	61.81%
Verhnetriberskaya GES (F)	Kolenergo	TGK-1	hydro	130.0	0.73%	62.54%
Kumskaya GES (F)	Kolenergo	TGK-1	hydro	96.0	0.54%	63.08%
Iovskaya GES (F)	Kolenergo	TGK-1	hydro	96.0	0.54%	63.62%
CHP-7 (SPb)	Lenenergo	TGK-1	CHP	85.0	0.48%	64.10%
Hydro 6 (Volkhov) (F)	Lenenergo	TGK-1	hydro	83.0	0.47%	64.57%
Ondskaya GES (F)	Karelenergo	TGK-1	hydro	80.0	0.45%	65.02%
Central CHP	Lenenergo	TGK-1	CHP	78.5	0.44%	65.46%
CHP-5 (SPb)	Lenenergo	TGK-1	CHP	64.0	0.36%	65.82%
Niva-1 GES (F)	Kolenergo	TGK-1	hydro	26.0	0.15%	65.96%
Kondopozhskaya GES (F)	Karelenergo	TGK-1	hydro	25.6	0.14%	66.11%
Paleozerskaya GES (F)	Karelenergo	TGK-1	hydro	25.0	0.14%	66.25%
Ushkozerskaya GES (F)	Karelenergo	TGK-1	hydro	18.0	0.10%	66.35%
Kaytakoski GES (F)	Kolenergo	TGK-1	hydro	11.2	0.06%	66.41%
Kirishskaya [Kirishi] GRES		OGK-6	GRES	2,100.0	11.79%	78.20%
Arhangelskaya CHP	Arkhenergo	TGK-2	CHP	450.0	2.53%	80.73%
Severodvinskaya CHP-2	Arkhenergo	TGK-2	CHP	410.0	2.30%	83.03%
Novgorodskaya CHP	Novgorodenergo	TGK-2	CHP	190.0	1.07%	84.10%
Severodvinskaya CHP-1	Arkhenergo	TGK-2	CHP	188.5	1.06%	85.16%
Pechorskaya GRES		OGK-3	GRES	1,060.0	5.95%	91.11%
Sosnogorskaya CHP	Komienergo	TGK-9	CHP	377.0	2.12%	93.23%
Vorkutinskaya CHP-2	Komienergo	TGK-9	CHP	270.0	1.52%	94.75%
Vorkutinskaya CHP-1	Komienergo	TGK-9	CHP	25.0	0.14%	94.89%
Intinskaya CHP	Komienergo	TGK-9	CHP	18.0	0.10%	94.99%
Pskovskaya GRES		OGK-2	GRES	430.0	2.41%	97.40%
North-West CHP		Independent	CHP	450.0	2.53%	99.93%
Pskovskaya CHP	Pskovenergo	Independent	CHP	9.5	0.05%	99.98%
Maksyutinskaya GES	Pskovenergo	Independent	hydro	1.5	0.01%	99.99%
Shilskaya GES	Pskovenergo	Independent	hydro	1.5	0.01%	100.00%

Table 3.3W – Market structure of the Northwest region during the winter season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
CHP-22 (SPb)	Lenenergo	TGK-1	CHP	800.0	4.60%	4.60%
CHP-21 (SPb)	Lenenergo	TGK-1	CHP	500.0	2.87%	7.47%
CHP-14 (SPb)	Lenenergo	TGK-1	CHP	330.0	1.90%	9.37%
Apatitskaya CHP	Kolenergo	TGK-1	CHP	323.0	1.86%	11.23%

CHP-15 (SPb)	Lenenergo	TGK-1	CHP	291.0	1.67%	12.90%
Petrozavodskaya CHP	Karelenergo	TGK-1	CHP	280.0	1.61%	14.51%
CHP-17 (SPb)	Lenenergo	TGK-1	CHP	255.0	1.47%	15.98%
Krivoporozhskaya GES (NF)	Karelenergo	TGK-1	hydro	154.1	0.89%	16.86%
Niva-3 GES (NF)	Kolenergo	TGK-1	hydro	131.8	0.76%	17.62%
Serebryanskaya GES-2 (NF)	Kolenergo	TGK-1	hydro	128.4	0.74%	18.36%
Hydro 13 (Ivangorod) (NF)	Lenenergo	TGK-1	hydro	107.0	0.62%	18.97%
Lesogorskaya GES (NF)	Lenenergo	TGK-1	hydro	92.5	0.53%	19.51%
Svetogorskaya GES (NF)	Lenenergo	TGK-1	hydro	86.0	0.49%	20.00%
Nizhne-svirskaya GES (NF)	Lenenergo	TGK-1	hydro	85.6	0.49%	20.49%
CHP-7 (Spb)	Lenenergo	TGK-1	CHP	85.0	0.49%	20.98%
Central CHP	Lenenergo	TGK-1	CHP	78.5	0.45%	21.43%
Putinskaya GES (NF)	Karelenergo	TGK-1	hydro	71.9	0.41%	21.85%
CHP-5 (SPb)	Lenenergo	TGK-1	CHP	64.0	0.37%	22.21%
Matkozhenskaya GES (NF)	Karelenergo	TGK-1	hydro	53.9	0.31%	22.52%
Niva-2 GES (NF)	Kolenergo	TGK-1	hydro	51.4	0.30%	22.82%
Borisoglebskaya GES (NF)	Kolenergo	TGK-1	hydro	47.9	0.28%	23.10%
Nizhnetulomskaya GES (NF)	Kolenergo	TGK-1	hydro	42.8	0.25%	23.34%
Poduzhenskaya GES (NF)	Karelenergo	TGK-1	hydro	41.1	0.24%	23.58%
Hevaskosky GES (NF)	Kolenergo	TGK-1	hydro	40.2	0.23%	23.81%
Rayakosky GES (NF)	Kolenergo	TGK-1	hydro	37.0	0.21%	24.02%
Vygodstrovskaya GES (NF)	Karelenergo	TGK-1	hydro	34.2	0.20%	24.22%
Yaniskoski GES (NF)	Kolenergo	TGK-1	hydro	26.2	0.15%	24.37%
Palokogorskaya GES (NF)	Karelenergo	TGK-1	hydro	25.7	0.15%	24.52%
Belomorskaya GES (NF)	Karelenergo	TGK-1	hydro	23.1	0.13%	24.65%
Nizhneriberskaya GES (NF)	Kolenergo	TGK-1	hydro	22.7	0.13%	24.78%
Leningrad NPP	RosAtom	RosAtom	nuclear	4,000.0	23.00%	47.78%
Kola NPP	RosAtom	RosAtom	nuclear	1,760.0	10.12%	57.90%
Arhangelskaya CHP	Arkhenergo	TGK-2	CHP	450.0	2.59%	60.48%
Severodvinskaya CHP-2	Arkhenergo	TGK-2	CHP	410.0	2.36%	62.84%
Novgorodskaya CHP	Novgorodenergo	TGK-2	CHP	190.0	1.09%	63.93%
Severodvinskaya CHP-1	Arkhenergo	TGK-2	CHP	188.5	1.08%	65.02%
Sosnogorskaya CHP	Komienergo	TGK-9	CHP	377.0	2.17%	67.18%
Vorkutinskaya CHP-2	Komienergo	TGK-9	CHP	270.0	1.55%	68.74%
Vorkutinskaya CHP-1	Komienergo	TGK-9	CHP	25.0	0.14%	68.88%
Intinskaya CHP	Komienergo	TGK-9	CHP	18.0	0.10%	68.98%
North-West CHP	Independent	Independent	CHP	450.0	2.59%	71.57%
Pskovskaya CHP	Pskovenergo	Independent	CHP	9.5	0.05%	71.62%
Non-base-load group						
Kirishskaya [Kirishi] GRES		OGK-6	GRES	2,100.0	12.07%	83.70%
Verhnetulomskaya GES (F)	Kolenergo	TGK-1	hydro	212.3	1.22%	84.92%
GRES-8	Lenenergo	TGK-1	GRES	192.0	1.10%	86.02%
Serebryanskaya GES-1 (F)	Kolenergo	TGK-1	hydro	172.1	0.99%	87.01%
Verhne-svirskaya GES (F)	Lenenergo	TGK-1	hydro	137.0	0.79%	87.80%
Knyazhegubskaya GES (F)	Kolenergo	TGK-1	hydro	123.3	0.71%	88.51%
Verhneriberskaya GES (F)	Kolenergo	TGK-1	hydro	111.3	0.64%	89.15%
Kumskaya GES (F)	Kolenergo	TGK-1	hydro	82.2	0.47%	89.62%
Iovskaya GES (F)	Kolenergo	TGK-1	hydro	82.2	0.47%	90.09%
Hydro 6 (Volkhov) (F)	Lenenergo	TGK-1	hydro	71.1	0.41%	90.50%
Ondskaya GES (F)	Karelenergo	TGK-1	hydro	68.5	0.39%	90.90%
Niva-1 GES (F)	Kolenergo	TGK-1	hydro	22.3	0.13%	91.02%
Kondopozhskaya GES (F)	Karelenergo	TGK-1	hydro	21.9	0.13%	91.15%
Paleozerskaya GES (F)	Karelenergo	TGK-1	hydro	21.4	0.12%	91.27%
Ushkozerskaya GES (F)	Karelenergo	TGK-1	hydro	15.4	0.09%	91.36%
Kaytakoski GES (F)	Kolenergo	TGK-1	hydro	9.6	0.06%	91.42%
Pechorskaya GRES		OGK-3	GRES	1,060.0	6.09%	97.51%
Pskovskaya GRES		OGK-2	GRES	430.0	2.47%	99.98%
Maksyutinskaya GES	Pskovenergo	Independent	hydro	1.5	0.01%	99.99%
Shilskaya GES	Pskovenergo	Independent	hydro	1.5	0.01%	100.00%

Table 3.4SF – Market structure of the Siberia region during spring and fall seasons

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Non-base-load group						
Sayano-Shushenskaya GES (F)		Hydro OGK	hydro	6,120.1	13.44%	13.44%
Boguchanskaya GES (F)		Hydro OGK	hydro	2,731.8	6.00%	19.43%
Novosibirskaya GES (F)		Hydro OGK	hydro	414.3	0.91%	20.34%

Bratskaya GES (F)	Irkutskenergo	Irkutskenergo	hydro	4,097.7	9.00%	29.34%
Ust'-Ilimskaya GES (F)	Irkutskenergo	Irkutskenergo	hydro	3,496.7	7.68%	37.02%
CHP-10 (Angarsk)	Irkutskenergo	Irkutskenergo	CHP	1,110.0	2.44%	39.45%
Novo-irkutskaya CHP	Irkutskenergo	Irkutskenergo	CHP	655.0	1.44%	40.89%
Irkutskaya GES (F)	Irkutskenergo	Irkutskenergo	hydro	603.2	1.32%	42.22%
Ust'-Ilimskaya CHP	Irkutskenergo	Irkutskenergo	CHP	565.0	1.24%	43.46%
CHP-9 (Angarsk)	Irkutskenergo	Irkutskenergo	CHP	475.0	1.04%	44.50%
CHP-11 (Usolye-Sibirskoe)	Irkutskenergo	Irkutskenergo	CHP	350.0	0.77%	45.27%
CHP-6 (Bratsk)	Irkutskenergo	Irkutskenergo	CHP	270.0	0.59%	45.86%
Novo-ziminskaya CHP	Irkutskenergo	Irkutskenergo	CHP	240.0	0.53%	46.39%
CHP-1 (Angarsk)	Irkutskenergo	Irkutskenergo	CHP	185.0	0.41%	46.79%
CHP-16 (Zheleznogorsk-Ilimskiy)	Irkutskenergo	Irkutskenergo	CHP	98.0	0.22%	47.01%
CHP-5 (Shelehov)	Irkutskenergo	Irkutskenergo	CHP	18.0	0.04%	47.05%
CHP-12 (Cheremhovo)	Irkutskenergo	Irkutskenergo	CHP	7.5	0.02%	47.07%
Belovskaya GRES	Kuzbassenergo	TGK-11	GRES	1,200.0	2.63%	49.70%
CHP-5	Omskenergo	TGK-11	CHP	695.0	1.53%	51.23%
Zapadno-Sibirskaya CHP	Kuzbassenergo	TGK-11	CHP	600.0	1.32%	52.54%
Yuzhno-Kuzbasskaya GRES	Kuzbassenergo	TGK-11	GRES	554.0	1.22%	53.76%
CHP-4	Omskenergo	TGK-11	CHP	535.0	1.17%	54.93%
CHP-3	Omskenergo	TGK-11	CHP	400.0	0.88%	55.81%
Tomskaya GRES-2	Tomskenergo	TGK-11	GRES	281.0	0.62%	56.43%
Tomskaya CHP-3	Tomskenergo	TGK-11	CHP	140.0	0.31%	56.74%
Kuznetskaya CHP	Kuzbassenergo	TGK-11	CHP	121.0	0.27%	57.00%
Novosibirskaya CHP-5	Novosibirskenergo	Novosibirskenergo	CHP	1,080.0	2.37%	59.37%
CHP-6	Novosibirskenergo	Novosibirskenergo	CHP	740.0	1.62%	61.00%
Novosibirskaya CHP-3	Novosibirskenergo	Novosibirskenergo	CHP	499.5	1.10%	62.09%
Novosibirskaya CHP-4	Novosibirskenergo	Novosibirskenergo	CHP	368.5	0.81%	62.90%
Novosibirskaya CHP-2	Novosibirskenergo	Novosibirskenergo	CHP	340.0	0.75%	63.65%
Barabinskaya CHP	Novosibirskenergo	Novosibirskenergo	CHP	84.0	0.18%	63.83%
Tom-Usinskaya GRES	Kuzbassenergo	TGK-12	GRES	1,272.0	2.79%	66.63%
Kemerovskaya GRES	Kuzbassenergo	TGK-12	GRES	500.0	1.10%	67.72%
Novo-Kemerovskaya CHP	Kuzbassenergo	TGK-12	CHP	465.0	1.02%	68.75%
Barnaulskaya CHP-3	Altayenergo	TGK-12	CHP	430.0	0.94%	69.69%
Barnaulskaya CHP-2	Altayenergo	TGK-12	CHP	339.0	0.74%	70.43%
Kemerovskaya CHP	Kuzbassenergo	TGK-12	CHP	80.0	0.18%	70.61%
Barnaulskaya CHP-1	Altayenergo	TGK-12	CHP	15.2	0.03%	70.64%
Nazarovskaya GRES	Krasnoyarskenergo	TGK-13	GRES	1,120.0	2.46%	73.10%
Krasnoyarsk CHP-2	Krasnoyarskenergo	TGK-13	CHP	439.0	0.96%	74.07%
Krasnoyarsk CHP-1	Krasnoyarskenergo	TGK-13	CHP	419.0	0.92%	74.99%
Abakanskaya CHP	Hakassenergo	TGK-13	CHP	270.0	0.59%	75.58%
Minusinskaya CHP	Krasnoyarskenergo	TGK-13	CHP	80.0	0.18%	75.75%
Kanskaya CHP	Krasnoyarskenergo	TGK-13	CHP	17.0	0.04%	75.79%
TyvaEnergo	Tyvaenergo	TGK-13	CHP	17.0	0.04%	75.83%
Krasnoyarsk CHP-3	Krasnoyarskenergo	TGK-13	CHP	0.0	0.00%	75.83%
Sosnovoborskaya CHP	Krasnoyarskenergo	TGK-13	CHP	0.0	0.00%	75.83%
Gusinozerskaya GRES		OGK-3	GRES	1,260.0	2.77%	78.59%
Kharanorskaya GRES		OGK-3	GRES	430.0	0.94%	79.54%
Berezovskaya GRES-1		OGK-4	GRES	1,440.0	3.16%	82.70%
Krasnoyarskaya GRES-2		OGK-6	GRES	1,250.0	2.74%	85.44%
Chitinskaya CHP-1	Chitaenergo	TGK-14	CHP	471.0	1.03%	86.48%
Krasnokamenskaya CHP	Chitaenergo	TGK-14	CHP	410.0	0.90%	87.38%
Ulan-Udenskaya CHP-1	Buryatenergo	TGK-14	CHP	130.4	0.29%	87.67%
Priargunskaya CHP	Chitaenergo	TGK-14	CHP	24.0	0.05%	87.72%
Pervomayskaya CHP	Chitaenergo	TGK-14	CHP	18.0	0.04%	87.76%
Sherlovogorskaya CHP	Chitaenergo	TGK-14	CHP	12.0	0.03%	87.78%
Chitinskaya CHP-2	Chitaenergo	TGK-14	CHP	6.0	0.01%	87.80%
Ulan-Udenskaya CHP-2	Buryatenergo	TGK-14	CHP	0.0	0.00%	87.80%
Timlyuskaya CHP	Buryatenergo	TGK-14	CHP	0.0	0.00%	87.80%
Krasnoyarsk GES (F)	Independent	Independent	hydro	5,463.6	12.00%	99.79%
Mamakanskaya GES (F)	Independent	Independent	hydro	91.0	0.20%	99.99%
Enashiminskaya GES (F)	Independent	Independent	hydro	3.6	0.01%	100.00%

Table 3.4SU – Market structure of the Siberia region during the summer season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Sayano-Shushenskaya GES (F)		Hydro OGK	hydro	6,721.0	14.06%	14.06%

Boguchanskaya GES (F)		Hydro OGK	hydro	3,000.0	6.28%	20.33%
Novosibirskaya GES (F)		Hydro OGK	hydro	455.0	0.95%	21.28%
Bratskaya GES (F)	Irkutskenergo	Irkutskenergo	hydro	4,500.0	9.41%	30.70%
Ust'-Ilimskaya GES (F)	Irkutskenergo	Irkutskenergo	hydro	3,840.0	8.03%	38.73%
Irkutskaya GES (F)	Irkutskenergo	Irkutskenergo	hydro	662.4	1.39%	40.12%
Krasnoyarsk GES (F)	Independent	Independent	hydro	6,000.0	12.55%	52.67%
Mamakanskaya GES (F)	Independent	Independent	hydro	100.0	0.21%	52.87%
Enashiminskaya GES (F)	Independent	Independent	hydro	4.0	0.01%	52.88%
Non-base-load group						
Belovskaya GRES	Kuzbassenergo	TGK-11	GRES	1,200.0	2.51%	55.39%
CHP-5	Omskenergo	TGK-11	CHP	695.0	1.45%	56.85%
Zapadno-Sibirskaya CHP	Kuzbassenergo	TGK-11	CHP	600.0	1.26%	58.10%
Yuzhno-Kuzbasskaya GRES	Kuzbassenergo	TGK-11	GRES	554.0	1.16%	59.26%
CHP-4	Omskenergo	TGK-11	CHP	535.0	1.12%	60.38%
CHP-3	Omskenergo	TGK-11	CHP	400.0	0.84%	61.22%
Tomskaya GRES-2	Tomskenergo	TGK-11	GRES	281.0	0.59%	61.80%
Tomskaya CHP-3	Tomskenergo	TGK-11	CHP	140.0	0.29%	62.10%
Kuznetskaya CHP	Kuzbassenergo	TGK-11	CHP	121.0	0.25%	62.35%
CHP-10 (Angarsk)	Irkutskenergo	Irkutskenergo	CHP	1,110.0	2.32%	64.67%
Novo-irkutskaya CHP	Irkutskenergo	Irkutskenergo	CHP	655.0	1.37%	66.04%
Ust'-Ilimskaya CHP	Irkutskenergo	Irkutskenergo	CHP	565.0	1.18%	67.22%
CHP-9 (Angarsk)	Irkutskenergo	Irkutskenergo	CHP	475.0	0.99%	68.22%
CHP-11 (Usolye-Sibirskoe)	Irkutskenergo	Irkutskenergo	CHP	350.0	0.73%	68.95%
CHP-6 (Bratsk)	Irkutskenergo	Irkutskenergo	CHP	270.0	0.56%	69.51%
Novo-ziminskaya CHP	Irkutskenergo	Irkutskenergo	CHP	240.0	0.50%	70.02%
CHP-1 (Angarsk)	Irkutskenergo	Irkutskenergo	CHP	185.0	0.39%	70.40%
CHP-16 (Zheleznogorsk-Ilimskiy)	Irkutskenergo	Irkutskenergo	CHP	98.0	0.20%	70.61%
CHP-5 (Shelehov)	Irkutskenergo	Irkutskenergo	CHP	18.0	0.04%	70.65%
CHP-12 (Cheremhovo)	Irkutskenergo	Irkutskenergo	CHP	7.5	0.02%	70.66%
Novosibirskaya CHP-5	Novosibirskenergo	Novosibirskenergo	CHP	1,080.0	2.26%	72.92%
CHP-6	Novosibirskenergo	Novosibirskenergo	CHP	740.0	1.55%	74.47%
Novosibirskaya CHP-3	Novosibirskenergo	Novosibirskenergo	CHP	499.5	1.04%	75.51%
Novosibirskaya CHP-4	Novosibirskenergo	Novosibirskenergo	CHP	368.5	0.77%	76.28%
Novosibirskaya CHP-2	Novosibirskenergo	Novosibirskenergo	CHP	340.0	0.71%	76.99%
Barabinskaya CHP	Novosibirskenergo	Novosibirskenergo	CHP	84.0	0.18%	77.17%
Tom-Usinskaya GRES	Kuzbassenergo	TGK-12	GRES	1,272.0	2.66%	79.83%
Kemerovskaya GRES	Kuzbassenergo	TGK-12	GRES	500.0	1.05%	80.88%
Novo-Kemerovskaya CHP	Kuzbassenergo	TGK-12	CHP	465.0	0.97%	81.85%
Barnaulskaya CHP-3	Altayenergo	TGK-12	CHP	430.0	0.90%	82.75%
Barnaulskaya CHP-2	Altayenergo	TGK-12	CHP	339.0	0.71%	83.46%
Kemerovskaya CHP	Kuzbassenergo	TGK-12	CHP	80.0	0.17%	83.63%
Barnaulskaya CHP-1	Altayenergo	TGK-12	CHP	15.2	0.03%	83.66%
Nazarovskaya GRES	Krasnoyarskenergo	TGK-13	GRES	1,120.0	2.34%	86.00%
Krasnoyarsk CHP-2	Krasnoyarskenergo	TGK-13	CHP	439.0	0.92%	86.92%
Krasnoyarsk CHP-1	Krasnoyarskenergo	TGK-13	CHP	419.0	0.88%	87.79%
Abakanskaya CHP	Krasnoyarskenergo	TGK-13	CHP	270.0	0.56%	88.36%
Minusinskaya CHP	Krasnoyarskenergo	TGK-13	CHP	80.0	0.17%	88.53%
Kanskaya CHP	Krasnoyarskenergo	TGK-13	CHP	17.0	0.04%	88.56%
TyvaEnergo	Tyvaenergo	TGK-13	CHP	17.0	0.04%	88.60%
Krasnoyarsk CHP-3	Krasnoyarskenergo	TGK-13	CHP	0.0	0.00%	88.60%
Sosnovoborskaya CHP	Krasnoyarskenergo	TGK-13	CHP	0.0	0.00%	88.60%
Gusinozerskaya GRES		OGK-3	GRES	1,260.0	2.64%	91.23%
Kharanorskaya GRES		OGK-3	GRES	430.0	0.90%	92.13%
Berezovskaya GRES-1		OGK-4	GRES	1,440.0	3.01%	95.14%
Krasnoyarskaya GRES-2		OGK-6	GRES	1,250.0	2.61%	97.76%
Chitinskaya CHP-1	Chitaenergo	TGK-14	CHP	471.0	0.99%	98.74%
Krasnokamenskaya CHP	Chitaenergo	TGK-14	CHP	410.0	0.86%	99.60%
Ulan-Udenskaya CHP-1	Buryatenergo	TGK-14	CHP	130.4	0.27%	99.87%
Priargunskaya CHP	Chitaenergo	TGK-14	CHP	24.0	0.05%	99.92%
Pervomayskaya CHP	Chitaenergo	TGK-14	CHP	18.0	0.04%	99.96%
Sherlovogorskaya CHP	Chitaenergo	TGK-14	CHP	12.0	0.03%	99.99%
Chitinskaya CHP-2	Chitaenergo	TGK-14	CHP	6.0	0.01%	100.00%
Ulan-Udenskaya CHP-2	Buryatenergo	TGK-14	CHP	0.0	0.00%	100.00%
Timlyuskaya CHP	Buryatenergo	TGK-14	CHP	0.0	0.00%	100.00%

Table 3.4W – Market structure of the Siberia region during the winter season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
CHP-10 (Angarsk)	Irkutskenergo	Irkutskenergo	CHP	1,110.0	2.47%	2.47%
Novo-irkutskaya CHP	Irkutskenergo	Irkutskenergo	CHP	655.0	1.46%	3.92%
Ust'-Ilimskaya CHP	Irkutskenergo	Irkutskenergo	CHP	565.0	1.26%	5.18%
CHP-9 (Angarsk)	Irkutskenergo	Irkutskenergo	CHP	475.0	1.06%	6.24%
CHP-11 (Usolye-Sibirskoe)	Irkutskenergo	Irkutskenergo	CHP	350.0	0.78%	7.02%
CHP-6 (Bratsk)	Irkutskenergo	Irkutskenergo	CHP	270.0	0.60%	7.62%
Novo-ziminskaya CHP	Irkutskenergo	Irkutskenergo	CHP	240.0	0.53%	8.15%
CHP-1 (Angarsk)	Irkutskenergo	Irkutskenergo	CHP	185.0	0.41%	8.56%
CHP-16 (Zheleznogorsk-Ilimskiy)	Irkutskenergo	Irkutskenergo	CHP	98.0	0.22%	8.78%
CHP-5 (Shelehov)	Irkutskenergo	Irkutskenergo	CHP	18.0	0.04%	8.82%
CHP-12 (Cheremhovo)	Irkutskenergo	Irkutskenergo	CHP	7.5	0.02%	8.84%
Novosibirskaya CHP-5	Novosibirskenergo	Novosibirskenergo	CHP	1,080.0	2.40%	11.24%
CHP-6	Novosibirskenergo	Novosibirskenergo	CHP	740.0	1.65%	12.88%
Novosibirskaya CHP-3	Novosibirskenergo	Novosibirskenergo	CHP	499.5	1.11%	13.99%
Novosibirskaya CHP-4	Novosibirskenergo	Novosibirskenergo	CHP	368.5	0.82%	14.81%
Novosibirskaya CHP-2	Novosibirskenergo	Novosibirskenergo	CHP	340.0	0.76%	15.57%
Barabinskaya CHP	Novosibirskenergo	Novosibirskenergo	CHP	84.0	0.19%	15.76%
CHP-5	Omskenergo	TGK-11	CHP	695.0	1.55%	17.30%
Zapadno-Sibirskaya CHP	Kuzbassenergo	TGK-11	CHP	600.0	1.33%	18.63%
CHP-4	Omskenergo	TGK-11	CHP	535.0	1.19%	19.82%
CHP-3	Omskenergo	TGK-11	CHP	400.0	0.89%	20.71%
Tomskaya CHP-3	Tomskenergo	TGK-11	CHP	140.0	0.31%	21.03%
Kuznetskaya CHP	Kuzbassenergo	TGK-11	CHP	121.0	0.27%	21.29%
Novo-Kemerovskaya CHP	Kuzbassenergo	TGK-12	CHP	465.0	1.03%	22.33%
Barnaullskaya CHP-3	Altayenergo	TGK-12	CHP	430.0	0.96%	23.28%
Barnaullskaya CHP-2	Altayenergo	TGK-12	CHP	339.0	0.75%	24.04%
Kemerovskaya CHP	Kuzbassenergo	TGK-12	CHP	80.0	0.18%	24.22%
Barnaullskaya CHP-1	Altayenergo	TGK-12	CHP	15.2	0.03%	24.25%
Krasnoyarsk CHP-2	Krasnoyarskenergo	TGK-13	CHP	439.0	0.98%	25.23%
Krasnoyarsk CHP-1	Krasnoyarskenergo	TGK-13	CHP	419.0	0.93%	26.16%
Abakanskaya CHP	Hakassenergo	TGK-13	CHP	270.0	0.60%	26.76%
Minusinskaya CHP	Krasnoyarskenergo	TGK-13	CHP	80.0	0.18%	26.94%
Kanskaya CHP	Krasnoyarskenergo	TGK-13	CHP	17.0	0.04%	26.97%
TyvaEnergo	Tyvaenergo	TGK-13	CHP	17.0	0.04%	27.01%
Krasnoyarsk CHP-3	Krasnoyarskenergo	TGK-13	CHP	0.0	0.00%	27.01%
Sosnovoborskaya CHP	Krasnoyarskenergo	TGK-13	CHP	0.0	0.00%	27.01%
Chitinskaya CHP-1	Chitaenergo	TGK-14	CHP	471.0	1.05%	28.06%
Krasnokamenskaya CHP	Chitaenergo	TGK-14	CHP	410.0	0.91%	28.97%
Ulan-Udenskaya CHP-1	Buryatenergo	TGK-14	CHP	130.4	0.29%	29.26%
Priargunskaya CHP	Chitaenergo	TGK-14	CHP	24.0	0.05%	29.31%
Pervomayskaya CHP	Chitaenergo	TGK-14	CHP	18.0	0.04%	29.35%
Sherlovogorskaya CHP	Chitaenergo	TGK-14	CHP	12.0	0.03%	29.38%
Chitinskaya CHP-2	Chitaenergo	TGK-14	CHP	6.0	0.01%	29.39%
Ulan-Udenskaya CHP-2	Buryatenergo	TGK-14	CHP	0.0	0.00%	29.39%
Timlyuskaya CHP	Buryatenergo	TGK-14	CHP	0.0	0.00%	29.39%
Non-base-load group						
Sayano-Shushenskaya GES (F)		Hydro OGK	hydro	5,966.9	13.27%	42.66%
Boguchanskaya GES (F)		Hydro OGK	hydro	2,663.4	5.92%	48.58%
Novosibirskaya GES (F)		Hydro OGK	hydro	403.9	0.90%	49.48%
Bratskaya GES (F)	Irkutskenergo	Irkutskenergo	hydro	3,995.1	8.88%	58.37%
Ust'-Ilimskaya GES (F)	Irkutskenergo	Irkutskenergo	hydro	3,409.2	7.58%	65.95%
Irkutskaya GES (F)	Irkutskenergo	Irkutskenergo	hydro	588.1	1.31%	67.25%
Belovskaya GRES	Kuzbassenergo	TGK-11	GRES	1,200.0	2.67%	69.92%
Yuzhno-Kuzbasskaya GRES	Kuzbassenergo	TGK-11	GRES	554.0	1.23%	71.15%
Tomskaya GRES-2	Tomskenergo	TGK-11	GRES	281.0	0.62%	71.78%
Tom-Usinskaya GRES	Kuzbassenergo	TGK-12	GRES	1,272.0	2.83%	74.61%
Kemerovskaya GRES	Kuzbassenergo	TGK-12	GRES	500.0	1.11%	75.72%
Gusinoozerskaya GRES		OGK-3	GRES	1,260.0	2.80%	78.52%
Kharanorskaya GRES		OGK-3	GRES	430.0	0.96%	79.48%
Berezovskaya GRES-1		OGK-4	GRES	1,440.0	3.20%	82.68%
Krasnoyarskaya GRES-2		OGK-6	GRES	1,250.0	2.78%	85.46%
Nazarovskaya GRES	Krasnoyarskenergo	TGK-13	GRES	1,120.0	2.49%	87.95%
Krasnoyarsk GES (F)	Independent	Independent	hydro	5,326.8	11.84%	99.79%
Mamakanskaya GES (F)	Independent	Independent	hydro	88.8	0.20%	99.99%
Enashiminskaya GES (F)	Independent	Independent	hydro	3.6	0.01%	100.00%

Table 3.5SF – Market structure of the South region during spring and fall seasons

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Volgodonskaya NPP		RosAtom	nuclear	1,000.0	9.30%	9.30%
Miatlinskaya GES (NF)		Hydro OGK	hydro	145.6	1.35%	10.65%
GES-2 (NF)		Hydro OGK	hydro	132.4	1.23%	11.88%
GES-3 (NF)		Hydro OGK	hydro	57.6	0.54%	12.42%
GES-4 (NF)		Hydro OGK	hydro	50.0	0.47%	12.88%
Chiryurtskaya GES (NF)		Hydro OGK	hydro	47.7	0.44%	13.33%
Aushigerskaya GES (NF)		Hydro OGK	hydro	39.7	0.37%	13.70%
Ezminskaya GES (NF)		Hydro OGK	hydro	29.8	0.28%	13.97%
Gizeldonskaya GES (NF)		Hydro OGK	hydro	15.4	0.14%	14.12%
Gergebilskaya GES (NF)		Hydro OGK	hydro	11.8	0.11%	14.23%
Belorechenskaya GES (NF)	Kubanenergo	TGK-8	hydro	31.8	0.30%	14.52%
Non-base-load group						
Chirkeysкая GES (F)		Hydro OGK	hydro	728.2	6.77%	21.29%
Irganayskaya GES (F)		Hydro OGK	hydro	529.6	4.92%	26.22%
Zelenchuiskie GES (F)		Hydro OGK	hydro	105.9	0.98%	27.20%
Sovetskaya GES (F)		Hydro OGK	hydro	39.7	0.37%	27.57%
GES-1 (F)		Hydro OGK	hydro	24.5	0.23%	27.80%
Egorlykskaya GES (F)		Hydro OGK	hydro	19.9	0.18%	27.98%
Baksanskaya GES (F)		Hydro OGK	hydro	16.6	0.15%	28.14%
GAES (F)		Hydro OGK	hydro	19.2	0.18%	28.31%
Sengileevskaya GES (F)		Hydro OGK	hydro	9.9	0.09%	28.41%
Svystuhinskaya GES (F)		Hydro OGK	hydro	7.8	0.07%	28.48%
Dzau GES (F)		Hydro OGK	hydro	6.1	0.06%	28.54%
Stavropol'skaya GRES		OGK 2	GRES	2,400.0	22.31%	50.85%
Novocherkasskaya GRES		OGK 6	GRES	2,245.0	20.87%	71.72%
Krasnodarskaya CHP	Kubanenergo	TGK-8	CHP	648.0	6.02%	77.75%
Volgodonskaya CHP-2	Rostovenergo	TGK-8	CHP	420.0	3.90%	81.65%
Tsymlyanskaya GES (F)	Rostovenergo	TGK-8	hydro	138.4	1.29%	82.94%
Rostovskaya CHP-2	Rostovenergo	TGK-8	CHP	160.0	1.49%	84.43%
Nesvetay GRES	Rostovenergo	TGK-8	GRES	105.0	0.98%	85.40%
Sochinskaya CHP	Kubanenergo	TGK-8	CHP	78.0	0.73%	86.13%
Kamenskaya CHP	Rostovenergo	TGK-8	CHP	34.0	0.32%	86.44%
Shahtinskaya GTU	Rostovenergo	TGK-8	CHP	31.6	0.29%	86.74%
Kaspiyskaya CHP	Dagenergo	TGK-8	CHP	26.0	0.24%	86.98%
Krasnopolyanskaya GES	Kubanenergo	TGK-8	hydro	18.5	0.17%	87.15%
Mahachkalinskaya CHP	Dagenergo	TGK-8	CHP	18.0	0.17%	87.32%
Kislovodskaya CHP	Stavropolenergo	TGK-8	CHP	12.0	0.11%	87.43%
Volgodonskaya CHP-1	Rostovenergo	TGK-8	CHP	6.0	0.06%	87.49%
Nevinomysskaya GRES		OGK 5	GRES	1,340.0	12.46%	99.94%
Argunskaya CHP	Nurenergo	Independent	CHP	6.0	0.06%	100.00%

Table 3.5SU – Market structure of the South region during the summer season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Chirkeysкая GES (F)		Hydro OGK	hydro	1,100.0	9.26%	9.26%
Irganayskaya GES (F)		Hydro OGK	hydro	800.0	6.73%	15.99%
Miatlinskaya GES (NF)		Hydro OGK	hydro	220.0	1.85%	17.84%
GES-2 (NF)		Hydro OGK	hydro	200.0	1.68%	19.52%
Zelenchuiskie GES (F)		Hydro OGK	hydro	160.0	1.35%	20.87%
GES-3 (NF)		Hydro OGK	hydro	87.0	0.73%	21.60 %
GES-4 (NF)		Hydro OGK	hydro	75.6	0.64%	22.24%
Chiryurtskaya GES (NF)		Hydro OGK	hydro	72.0	0.61%	22.85%
Aushigerskaya GES (NF)		Hydro OGK	hydro	60.0	0.50%	23.35%
Zelenchuiskie GES (F)		Hydro OGK	hydro	60.0	0.50%	23.86%
Ezminskaya GES (NF)		Hydro OGK	hydro	45.0	0.38%	24.23%
Zelenchuiskie GES (F)		Hydro OGK	hydro	37.0	0.31%	24.55%
Zelenchuiskie GES (F)		Hydro OGK	hydro	30.0	0.25%	24.80%
Baksanskaya GES (F)		Hydro OGK	hydro	25.0	0.21%	25.01%
Gizeldonskaya GES (NF)		Hydro OGK	hydro	23.2	0.20%	25.20%
GAES (F)		Hydro OGK	hydro	19.2	0.16%	25.37%

Gergebilsкая GES (NF)		Hydro OGK	hydro	17.8	0.15%	25.52%
Sengileevskaya GES (F)		Hydro OGK	hydro	15.0	0.13%	25.64%
Svystuhinskaya GES (F)		Hydro OGK	hydro	11.7	0.10%	25.74%
Dzau GES (F)		Hydro OGK	hydro	9.2	0.08%	25.82%
Volgodonskaya NPP		RosAtom	nuclear	1,000.0	8.42%	34.23%
Tsymlyanskaya GES (F)	Rostovenergo	TGK-8	hydro	209.0	1.76%	35.99%
Belorechenskaya GES NF)	Kubanenergo	TGK-8	hydro	48.0	0.40%	36.40%
Krasnopol'yanskaya GES (F)	Kubanenergo	TGK-8	hydro	28.0	0.24%	36.63%
Non-base-load group						
Stavropol'skaya GRES		OGK 2	GRES	2,400.0	20.20%	56.83%
Novocherkasskaya GRES		OGK 6	GRES	2,245.0	18.89%	75.72%
Krasnodarskaya CHP	Kubanenergo	TGK-8	CHP	648.0	5.45%	81.18%
Volgodonskaya CHP-2	Rostovenergo	TGK-8	CHP	420.0	3.53%	84.71%
Rostovskaya CHP-2	Rostovenergo	TGK-8	CHP	160.0	1.35%	86.06%
Nesvetay GRES	Rostovenergo	TGK-8	GRES	105.0	0.88%	86.94%
Sochinskaya CHP	Kubanenergo	TGK-8	CHP	78.0	0.66%	87.60%
Kamenskaya CHP	Rostovenergo	TGK-8	CHP	34.0	0.29%	87.88%
Shahtinskaya CCGT	Rostovenergo	TGK-8	CHP	31.6	0.27%	88.15%
Kaspiyskaya CHP	Dagenergo	TGK-8	CHP	26.0	0.22%	88.37%
Mahachkalinskaya CHP	Dagenergo	TGK-8	CHP	18.0	0.15%	88.52%
Kislovodskaya CHP	Stavropolenergo	TGK-8	CHP	12.0	0.10%	88.62%
Volgodonskaya CHP-1	Rostovenergo	TGK-8	CHP	6.0	0.05%	88.67%
Nevinomysskaya GRES		OGK 5	GRES	1,340.0	11.28%	99.95%
Argunskaya CHP	Nurenergo	Independent	CHP	6.0	0.05%	100.00%

Table 3.5W – Market structure of the South region during the winter season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Miatlinskaya GES (NF)		Hydro OGK	hydro	106.2	1.05%	1.05%
GES-2 (NF)		Hydro OGK	hydro	96.5	0.95%	2.00%
GES-3 (NF)		Hydro OGK	hydro	42.0	0.41%	2.41%
GES-4 (NF)		Hydro OGK	hydro	36.5	0.36%	2.77%
Chiryurtskaya GES (NF)		Hydro OGK	hydro	34.7	0.34%	3.11%
Aushigerskaya GES (NF)		Hydro OGK	hydro	29.0	0.29%	3.39%
Ezminskaya GES (NF)		Hydro OGK	hydro	21.7	0.21%	3.61%
Gizeldonskaya GES (NF)		Hydro OGK	hydro	11.2	0.11%	3.72%
Gergebilsкая GES (NF)		Hydro OGK	hydro	8.6	0.08%	3.80%
Krasnodarskaya CHP	Kubanenergo	TGK-8	CHP	648.0	6.38%	10.18%
Volgodonskaya CHP-2	Rostovenergo	TGK-8	CHP	420.0	4.13%	14.32%
Rostovskaya CHP-2	Rostovenergo	TGK-8	CHP	160.0	1.58%	15.89%
Sochinskaya CHP	Kubanenergo	TGK-8	CHP	78.0	0.77%	16.66%
Kamenskaya CHP	Rostovenergo	TGK-8	CHP	34.0	0.33%	17.00%
Shahtinskaya CCGT	Rostovenergo	TGK-8	CHP	31.6	0.31%	17.31%
Kaspiyskaya CHP	Dagenergo	TGK-8	CHP	26.0	0.26%	17.56%
Belorechenskaya GES (NF)	Kubanenergo	TGK-8	hydro	23.2	0.23%	17.79%
Mahachkalinskaya CHP	Dagenergo	TGK-8	CHP	18.0	0.18%	17.97%
Kislovodskaya CHP	Stavropolenergo	TGK-8	CHP	12.0	0.12%	18.09%
Volgodonskaya CHP-1	Rostovenergo	TGK-8	CHP	6.0	0.06%	18.15%
Volgodonskaya NPP		RosAtom	nuclear	1,000.0	9.85%	27.99%
Argunskaya CHP	Nurenergo	Independent	CHP	6.0	0.06%	28.05%
Non-base-load group						
Chirkeysкая GES (F)		Hydro OGK	hydro	530.8	5.23%	33.27%
Irganayskaya GES (F)		Hydro OGK	hydro	386.0	3.80%	37.08%
Zelenchukskie GES (F)		Hydro OGK	hydro	77.2	0.76%	37.84%
Sovetskaya GES (F)		Hydro OGK	hydro	29.0	0.29%	38.12%
GES-1 (F)		Hydro OGK	hydro	17.9	0.18%	38.30%
Egorlykskaya GES (F)		Hydro OGK	hydro	14.5	0.14%	38.44%
Baksanskaya GES (F)		Hydro OGK	hydro	12.1	0.12%	38.56%
GAES (F)		Hydro OGK	hydro	19.2	0.19%	38.75%
Sengileevskaya GES (F)		Hydro OGK	hydro	7.2	0.07%	38.82%
Svystuhinskaya GES (F)		Hydro OGK	hydro	5.7	0.06%	38.87%
Dzau GES (F)		Hydro OGK	hydro	4.4	0.04%	38.92%
Stavropol'skaya GRES		OGK 2	GRES	2,400.0	23.63%	62.55%
Novocherkasskaya GRES		OGK 6	GRES	2,245.0	22.10%	84.65%
Nevinomysskaya GRES		OGK 5	GRES	1,340.0	13.19%	97.84%
Nesvetay GRES	Rostovenergo	TGK-8	GRES	105.0	1.03%	98.87%

Tsymlyanskaya GES (F)	Rostovenergo	TGK-8	hydro	100.8	0.99%	99.87%
Krasnopolyanskaya GES (F)	Kubanenergo	TGK-8	hydro	13.5	0.13%	100.00%

Table 3.6S – Market structure of the Urals region during the spring season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Votkinskaya GES (F)		Hydro OGK	hydro	1,020.0	2.58%	2.58%
Kamskaya GES (F)		Hydro OGK	hydro	462.0	1.17%	3.75%
Beloyarskaya NPP	RosAtom	RosAtom	nuclear	600.0	1.52%	5.27%
Pavlovskaya GES (F)	Bashkirenergo	Bashkirenergo	hydro	166.4	0.42%	5.69%
Yumaguzinskaya GES (F)	Bashkirenergo	Bashkirenergo	hydro	45.0	0.11%	5.81%
Iriklianskaya GES (F)	Orenburgenergo	TGK-7	hydro	30.0	0.08%	5.88%
Shirokovskaya GES-7 (F)	Permenergo	TGK-9	hydro	28.0	0.07%	5.95%
Non-base-load group						
Iriklianskaya GRES		OGK-1	GRES	2,430.0	6.15%	12.11%
Permskaya GRES		OGK-1	GRES	2,400.0	6.08%	18.18%
V-Tagil'skaya GRES		OGK-1	GRES	1,521.0	3.85%	22.04%
Nizhnevartovskaya GRES		OGK-1	GRES	800.0	2.03%	24.06%
Urengoy'skaya GRES		OGK-1	GRES	24.0	0.06%	24.12%
Surgut'skaya GRES-1		OGK-2	GRES	3,280.0	8.31%	32.43%
Troitskaya GRES		OGK-2	GRES	2,059.0	5.21%	37.64%
Serovskaya GRES		OGK-2	GRES	526.0	1.33%	38.97%
Surgut'skaya GRES-2		OGK-4	GRES	4,800.0	12.15%	51.13%
Yayvinskaya GRES		OGK-4	GRES	600.0	1.52%	52.65%
Reftinskaya GRES		OGK-5	GRES	3,800.0	9.62%	62.27%
Sredneural'skaya GRES		OGK-5	GRES	1,205.0	3.05%	65.32%
Karmanovskaya GRES	Bashkirenergo	Bashkirenergo	GRES	1,800.0	4.56%	69.88%
Novosalavatskaya CHP	Bashkirenergo	Bashkirenergo	CHP	530.0	1.34%	71.22%
Sterlitamak'skaya CHP	Bashkirenergo	Bashkirenergo	CHP	511.0	1.29%	72.51%
Ufimskaya CHP-2	Bashkirenergo	Bashkirenergo	CHP	466.0	1.18%	73.69%
Ufimskaya CHP-4	Bashkirenergo	Bashkirenergo	CHP	400.0	1.01%	74.71%
Novosterlitamak'skaya CHP	Bashkirenergo	Bashkirenergo	CHP	355.0	0.90%	75.61%
Salavatskaya CHP	Bashkirenergo	Bashkirenergo	CHP	264.0	0.67%	76.27%
Priufimskaya CHP	Bashkirenergo	Bashkirenergo	CHP	200.0	0.51%	76.78%
Kumertauskaya CHP	Bashkirenergo	Bashkirenergo	CHP	145.0	0.37%	77.15%
Ufimskaya CHP-3	Bashkirenergo	Bashkirenergo	CHP	110.0	0.28%	77.43%
Ufimskaya CHP-1	Bashkirenergo	Bashkirenergo	CHP	94.0	0.24%	77.66%
Zaural'skaya CHP	Bashkirenergo	Bashkirenergo	CHP	27.4	0.07%	77.73%
Tyumenskaya CHP-2	Tyumenenergo	TGK-10	CHP	755.0	1.91%	79.64%
Kurgan'skaya CHP	Kurganenergo	TGK-10	CHP	480.0	1.22%	80.86%
Tobolskaya CHP	Tyumenenergo	TGK-10	CHP	452.0	1.14%	82.00%
Chelyabinskaya CHP-2	Chelyabenergo	TGK-10	CHP	320.0	0.81%	82.82%
Tyumenskaya CHP-1	Tyumenenergo	TGK-10	CHP	310.0	0.78%	83.60%
Argayashskaya CHP	Chelyabenergo	TGK-10	CHP	195.0	0.49%	84.09%
Chelyabinskaya CHP-3	Chelyabenergo	TGK-10	CHP	180.0	0.46%	84.55%
Chelyabinskaya CHP-1	Chelyabenergo	TGK-10	CHP	149.0	0.38%	84.93%
Chelyabinskaya GRES	Chelyabenergo	TGK-10	GRES	82.0	0.21%	85.13%
Urengoy'skaya GRES	Tyumenenergo	TGK-10	GRES	24.0	0.06%	85.20%
Novo-sverdlovskaya CHP	Sverdlovenergo	TGK-9	CHP	550.0	1.39%	86.59%
Permskaya CHP-9	Permenergo	TGK-9	CHP	445.0	1.13%	87.71%
Permskaya CHP-14	Permenergo	TGK-9	CHP	345.0	0.87%	88.59%
Nizhneturinskaya GRES	Sverdlovenergo	TGK-9	GRES	284.0	0.72%	89.31%
Chaykovskaya CHP-18	Permenergo	TGK-9	CHP	170.0	0.43%	89.74%
Bogoslovskaya CHP	Sverdlovenergo	TGK-9	CHP	141.0	0.36%	90.10%
Krasnogorskaya CHP	Sverdlovenergo	TGK-9	CHP	121.0	0.31%	90.40%
Bereznikovskaya CHP-2	Permenergo	TGK-9	CHP	117.5	0.30%	90.70%
Zakamskaya CHP-5	Permenergo	TGK-9	CHP	77.0	0.19%	90.89%
Bereznikovskaya CHP-4	Permenergo	TGK-9	CHP	62.2	0.16%	91.05%
Permskaya CHP-6	Permenergo	TGK-9	CHP	56.7	0.14%	91.20%
Kachkanarskaya CHP	Sverdlovenergo	TGK-9	CHP	50.0	0.13%	91.32%
Sverdlovskaya CHP	Sverdlovenergo	TGK-9	CHP	41.0	0.10%	91.43%
Pervouralskaya CHP	Sverdlovenergo	TGK-9	CHP	36.0	0.09%	91.52%
Permskaya CHP-13	Permenergo	TGK-9	CHP	18.0	0.05%	91.56%
Kizelovskaya GRES-3	Permenergo	TGK-9	GRES	14.0	0.04%	91.60%
UdmurtEnergo	Udmurtenergo	TGK-5	CHP	486.0	1.23%	92.83%
Kirovskaya CHP-5	Kirovenergo	TGK-5	CHP	450.0	1.14%	93.97%

Kirovskaya CHP-4	Kirovenergo	TGK-5	CHP	320.0	0.81%	94.78%
Kirovskaya CHP-3	Kirovenergo	TGK-5	CHP	160.0	0.41%	95.18%
Kirovskaya CHP-1	Kirovenergo	TGK-5	CHP	10.3	0.03%	95.21%
Sakmarskaya CHP	Orenburgenergo	TGK-7	CHP	445.0	1.13%	96.34%
Kargalinskaya CHP	Orenburgenergo	TGK-7	CHP	320.0	0.81%	97.15%
Orskaya CHP-1	Orenburgenergo	TGK-7	CHP	245.0	0.62%	97.77%
Yuzno-Ural'skaya GRES		OGK 3	GRES	882.0	2.23%	100.00%

Table 3.6F – Market structure of the Urals region during summer and fall seasons

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Beloyarskaya NPP	RosAtom	RosAtom	nuclear	600.0	1.53%	1.53%
Non-base-load group						
Votkinskaya GES (F)		Hydro OGK	hydro	799.7	2.04%	3.58%
Kamskaya GES (F)		Hydro OGK	hydro	362.2	0.93%	4.50%
Irkliinskaya GRES		OGK-1	GRES	2,430.0	6.21%	10.72%
Permskaya GRES		OGK-1	GRES	2,400.0	6.14%	16.85%
V-Tagil'skaya GRES		OGK-1	GRES	1,521.0	3.89%	20.74%
Nizhnevartovskaya GRES		OGK-1	GRES	800.0	2.05%	22.79%
Urengoy'skaya GRES		OGK-1	GRES	24.0	0.06%	22.85%
Surgut'skaya GRES-1		OGK-2	GRES	3,280.0	8.39%	31.23%
Troitskaya GRES		OGK-2	GRES	2,059.0	5.26%	36.50%
Serov'skaya GRES		OGK-2	GRES	526.0	1.34%	37.84%
Surgut'skaya GRES-2		OGK-4	GRES	4,800.0	12.27%	50.11%
Yayvinkaya GRES		OGK-4	GRES	600.0	1.53%	51.65%
Karmanovskaya GRES	Bashkirenergo	Bashkirenergo	GRES	1,800.0	4.60%	56.25%
Novosalavatskaya CHP	Bashkirenergo	Bashkirenergo	CHP	530.0	1.36%	57.61%
Sterlitamak'skaya CHP	Bashkirenergo	Bashkirenergo	CHP	511.0	1.31%	58.91%
Ufimskaya CHP-2	Bashkirenergo	Bashkirenergo	CHP	466.0	1.19%	60.10%
Ufimskaya CHP-4	Bashkirenergo	Bashkirenergo	CHP	400.0	1.02%	61.13%
Novosterlitamak'skaya CHP	Bashkirenergo	Bashkirenergo	CHP	355.0	0.91%	62.03%
Salavatskaya CHP	Bashkirenergo	Bashkirenergo	CHP	264.0	0.67%	62.71%
Priufimskaya CHP	Bashkirenergo	Bashkirenergo	CHP	200.0	0.51%	63.22%
Kumertauskaya CHP	Bashkirenergo	Bashkirenergo	CHP	145.0	0.37%	63.59%
Pavlovskaya GES (F)	Bashkirenergo	Bashkirenergo	hydro	130.5	0.33%	63.92%
Ufimskaya CHP-3	Bashkirenergo	Bashkirenergo	CHP	110.0	0.28%	64.21%
Ufimskaya CHP-1	Bashkirenergo	Bashkirenergo	CHP	94.0	0.24%	64.45%
Yumaguzinskaya GES (F)	Bashkirenergo	Bashkirenergo	hydro	35.3	0.09%	64.54%
Zaural'skaya CHP	Bashkirenergo	Bashkirenergo	CHP	27.4	0.07%	64.61%
Reftinskaya GRES		OGK-5	GRES	3,800.0	9.72%	74.32%
Sredneural'skaya GRES		OGK-5	GRES	1,205.0	3.08%	77.40%
Tyumenskaya CHP-2	Tyumenenergo	TGK-10	CHP	755.0	1.93%	79.33%
Kurganskaya CHP	Kurganenergo	TGK-10	CHP	480.0	1.23%	80.56%
Tobolskaya CHP	Tyumenenergo	TGK-10	CHP	452.0	1.16%	81.71%
Chelyabinskaya CHP-2	Chelyabenergo	TGK-10	CHP	320.0	0.82%	82.53%
Tyumenskaya CHP-1	Tyumenenergo	TGK-10	CHP	310.0	0.79%	83.33%
Argayashskaya CHP	Chelyabenergo	TGK-10	CHP	195.0	0.50%	83.82%
Chelyabinskaya CHP-3	Chelyabenergo	TGK-10	CHP	180.0	0.46%	84.28%
Chelyabinskaya CHP-1	Chelyabenergo	TGK-10	CHP	149.0	0.38%	84.66%
Chelyabinskaya GRES	Chelyabenergo	TGK-10	GRES	82.0	0.21%	84.87%
Urengoy'skaya GRES	Tyumenenergo	TGK-10	GRES	24.0	0.06%	84.94%
Novo-sverdlovskaya CHP	Sverdlovenergo	TGK-9	CHP	550.0	1.41%	86.34%
Permskaya CHP-9	Permenergo	TGK-9	CHP	445.0	1.14%	87.48%
Permskaya CHP-14	Permenergo	TGK-9	CHP	345.0	0.88%	88.36%
Nizhneturinskaya GRES	Sverdlovenergo	TGK-9	GRES	284.0	0.73%	89.09%
Chaykovskaya CHP-18	Permenergo	TGK-9	CHP	170.0	0.43%	89.52%
Bogoslovskaya CHP	Sverdlovenergo	TGK-9	CHP	141.0	0.36%	89.88%
Krasnogorskaya CHP	Sverdlovenergo	TGK-9	CHP	121.0	0.31%	90.19%
Bereznikovskaya CHP-2	Permenergo	TGK-9	CHP	117.5	0.30%	90.49%
Zakamskaya CHP-5	Permenergo	TGK-9	CHP	77.0	0.20%	90.69%
Bereznikovskaya CHP-4	Permenergo	TGK-9	CHP	62.2	0.16%	90.85%
Permskaya CHP-6	Permenergo	TGK-9	CHP	56.7	0.14%	90.99%
Kachkanarskaya CHP	Sverdlovenergo	TGK-9	CHP	50.0	0.13%	91.12%
Sverdlovskaya CHP	Sverdlovenergo	TGK-9	CHP	41.0	0.10%	91.23%
Pervouralskaya CHP	Sverdlovenergo	TGK-9	CHP	36.0	0.09%	91.32%
Shirokovskaya GES-7 (F)	Permenergo	TGK-9	hydro	22.0	0.06%	91.37%

Permskaya CHP-13	Permenergo	TGK-9	CHP	18.0	0.05%	91.42%
Kizelovskaya GRES-3	Permenergo	TGK-9	GRES	14.0	0.04%	91.46%
UdmurtEnergo	Udmurtenergo	TGK-5	CHP	486.0	1.24%	92.70%
Kirovskaya CHP-5	Kirovenergo	TGK-5	CHP	450.0	1.15%	93.85%
Kirovskaya CHP-4	Kirovenergo	TGK-5	CHP	320.0	0.82%	94.67%
Kirovskaya CHP-3	Kirovenergo	TGK-5	CHP	160.0	0.41%	95.08%
Kirovskaya CHP-1	Kirovenergo	TGK-5	CHP	10.3	0.03%	95.10%
Sakmarskaya CHP	Orenburgenergo	TGK-7	CHP	445.0	1.14%	96.24%
Kargalinskaya CHP	Orenburgenergo	TGK-7	CHP	320.0	0.82%	97.06%
Orskaya CHP-1	Orenburgenergo	TGK-7	CHP	245.0	0.63%	97.68%
Iriklinskaya GES (F)	Orenburgenergo	TGK-7	hydro	23.5	0.06%	97.75%
Yuzno-Ural'skaya GRES		OGK-3	GRES	882.0	2.25%	100.00%

Table 3.6W – Market structure of the Urals region during the winter season

Plant	Energo	Proposed Parent	Technology	Capacity	Capacity share	Cumulative capacity share
Base-load group						
Novosalavatskaya CHP	Bashkirenergo	Bashkirenergo	CHP	530.0	1.37%	1.37%
Sterlitamakskaya CHP	Bashkirenergo	Bashkirenergo	CHP	511.0	1.32%	2.68%
Ufimskaya CHP-2	Bashkirenergo	Bashkirenergo	CHP	466.0	1.20%	3.89%
Ufimskaya CHP-4	Bashkirenergo	Bashkirenergo	CHP	400.0	1.03%	4.92%
Novosterlitamakskaya CHP	Bashkirenergo	Bashkirenergo	CHP	355.0	0.92%	5.83%
Salavatskaya CHP	Bashkirenergo	Bashkirenergo	CHP	264.0	0.68%	6.51%
Priufimskaya CHP	Bashkirenergo	Bashkirenergo	CHP	200.0	0.52%	7.03%
Kumertauskaya CHP	Bashkirenergo	Bashkirenergo	CHP	145.0	0.37%	7.40%
Ufimskaya CHP-3	Bashkirenergo	Bashkirenergo	CHP	110.0	0.28%	7.69%
Ufimskaya CHP-1	Bashkirenergo	Bashkirenergo	CHP	94.0	0.24%	7.93%
Zaural'skaya CHP	Bashkirenergo	Bashkirenergo	CHP	27.4	0.07%	8.00%
Tyumenskaya CHP-2	Tyumenenergo	TGK10	CHP	755.0	1.95%	9.95%
Kurganskaya CHP	Kurganenergo	TGK10	CHP	480.0	1.24%	11.19%
Tobolskaya CHP	Tyumenenergo	TGK10	CHP	452.0	1.17%	12.35%
Chelyabinskaya CHP-2	Chelyabenergo	TGK10	CHP	320.0	0.83%	13.18%
Tyumenskaya CHP-1	Tyumenenergo	TGK10	CHP	310.0	0.80%	13.98%
Argayashskaya CHP	Chelyabenergo	TGK10	CHP	195.0	0.50%	14.48%
Chelyabinskaya CHP-3	Chelyabenergo	TGK10	CHP	180.0	0.46%	14.94%
Chelyabinskaya CHP-1	Chelyabenergo	TGK10	CHP	149.0	0.38%	15.33%
Novo-sverdlovskaya CHP	Sverdlovennergo	TGK-9	CHP	550.0	1.42%	16.75%
Permskaya CHP-9	Permenergo	TGK-9	CHP	445.0	1.15%	17.89%
Permskaya CHP-14	Permenergo	TGK-9	CHP	345.0	0.89%	18.78%
Chaykovskaya CHP-18	Permenergo	TGK-9	CHP	170.0	0.44%	19.22%
Bogoslovskaya CHP	Sverdlovennergo	TGK-9	CHP	141.0	0.36%	19.59%
Krasnogorskaya CHP	Sverdlovennergo	TGK-9	CHP	121.0	0.31%	19.90%
Bereznikovskaya CHP-2	Permenergo	TGK-9	CHP	117.5	0.30%	20.20%
Zakamskaya CHP-5	Permenergo	TGK-9	CHP	77.0	0.20%	20.40%
Bereznikovskaya CHP-4	Permenergo	TGK-9	CHP	62.2	0.16%	20.56%
Permskaya CHP-6	Permenergo	TGK-9	CHP	56.7	0.15%	20.71%
Kachkanarskaya CHP	Sverdlovennergo	TGK-9	CHP	50.0	0.13%	20.84%
Sverdlovskaya CHP	Sverdlovennergo	TGK-9	CHP	41.0	0.11%	20.94%
Pervouralskaya CHP	Sverdlovennergo	TGK-9	CHP	36.0	0.09%	21.03%
Permskaya CHP-13	Permenergo	TGK-9	CHP	18.0	0.05%	21.08%
UdmurtEnergo	Udmurtenergo	TGK-5	CHP	486.0	1.25%	22.33%
Kirovskaya CHP-5	Kirovenergo	TGK-5	CHP	450.0	1.16%	23.49%
Kirovskaya CHP-4	Kirovenergo	TGK-5	CHP	320.0	0.83%	24.32%
Kirovskaya CHP-3	Kirovenergo	TGK-5	CHP	160.0	0.41%	24.73%
Kirovskaya CHP-1	Kirovenergo	TGK-5	CHP	10.3	0.03%	24.76%
Sakmarskaya CHP	Orenburgenergo	TGK-7	CHP	445.0	1.15%	25.91%
Kargalinskaya CHP	Orenburgenergo	TGK-7	CHP	320.0	0.83%	26.73%
Orskaya CHP-1	Orenburgenergo	TGK-7	CHP	245.0	0.63%	27.36%
Beloyarskaya NPP	RosAtom	RosAtom	nuclear	600.0	1.55%	28.91%
Non-base-load group						
Votkinskaya GES (F)		Hydro OGK	hydro	601.7	1.55%	30.46%
Kamskaya GES (F)		Hydro OGK	hydro	272.5	0.70%	31.17%
Iriklinskaya GRES		OGK 1	GRES	2,430.0	6.27%	37.43%
Permskaya GRES		OGK 1	GRES	2,400.0	6.19%	43.62%
V-Tagil'skaya GRES		OGK 1	GRES	1,521.0	3.92%	47.55%
Nizhnevartovskaya GRES		OGK 1	GRES	800.0	2.06%	49.61%
Urengoy'skaya GRES		OGK 1	GRES	24.0	0.06%	49.67%

Surgutskaya GRES-1		OGK 2	GRES	3,280.0	8.46%	58.13%
Troitskaya GRES		OGK 2	GRES	2,059.0	5.31%	63.44%
Serovskaya GRES		OGK 2	GRES	526.0	1.36%	64.80%
Surgutskaya GRES-2		OGK 4	GRES	4,800.0	12.38%	77.18%
Yayvinskaya GRES		OGK 4	GRES	600.0	1.55%	78.72%
Reftinskaya GRES		OGK 5	GRES	3,800.0	9.80%	88.52%
Sredneuralskaya GRES		OGK 5	GRES	1,205.0	3.11%	91.63%
Karmanovskaya GRES	Bashkirenergo	Bashkirenergo	GRES	1,800.0	4.64%	96.27%
Pavlovskaya GES (F)	Bashkirenergo	Bashkirenergo	hydro	98.2	0.25%	96.53%
Yumaguzinskaya GES (F)	Bashkirenergo	Bashkirenergo	hydro	26.5	0.07%	96.60%
Yuzno-Ural'skaya GRES		OGK 3	GRES	882.0	2.27%	98.87%
Nizhneturinskaya GRES	Sverdlovennergo	TGK-9	GRES	284.0	0.73%	99.60%
Shirokovskaya GES-7 (F)	Permenergo	TGK-9	hydro	16.5	0.04%	99.64%
Kizelovskaya GRES-3	Permenergo	TGK-9	GRES	14.0	0.04%	99.68%
Chelyabinskaya GRES	Chelyabenergo	TGK10	GRES	82.0	0.21%	99.89%
Urengoy'skaya GRES	Tyumenenergo	TGK10	GRES	24.0	0.06%	99.95%
Irkutskaya GES (F)	Orenburgenergo	TGK-7	hydro	17.7	0.05%	100.00%