



## Capacity market in Russia

Capacity market in Russia was designed to ensure resource adequacy in period of peak demand. Initially, it was planned that capacity market will be in a form of competitive capacity auctions (similar to the PJM market area in the US), where new and old generators compete to be selected to cover the peak demand and get guarantee payments. Thus, competition in the capacity market will ensure the most cost-effective entry of new generation and exit of old. Capacity market design for 2011 and following years was defined in government decree N89 on 24.02.2010 "On organization of long-term capacity market". The immediate need for investments in new capacity as well as high market concentration forced to introduce some regulatory policies in the current capacity market design. Thus, the current capacity market combines the element of competition and regulation with the prevailing role of the last one.

The System Operator (SO) defines the zones of free power flow that emerge during peak hours because of the inadequacy of the transmission capacity between the zones. In 2011, market was divided into 29 zones of free power flows. For each zone, the SO estimates the peak demand (or capacity demand) for each month of the following year, and selects the generators that can cover the capacity demand. Generators (nuclear, hydro and thermal) that participate in the capacity market are divided into two main categories: old capacity and the new capacity that have been launched since 2007. Participation in the capacity market and the capacity payments are different for the old and new generation. New generators get regulated fixed capacity payments, while the old generators compete in Competitive Capacity Auctions (CCA).

Russia's electricity sector reform was accompanied by a huge need for new investment in the generation sector. During the first period of the reform 2010-2015, the development of new generation capacity has been governed through government regulation. Mandatory investment programs concern the largest generating companies and the programs are enforced through Capacity Delivery Agreements (CDA) for new thermal power plants and Long-term Agreements (LTA) for new hydro and nuclear power plants. Investors have obligations concerning punctual commissioning of new generation while the government guarantees a return on invested capital for ten or twenty years starting from the year of commissioning of the power plant (thermal power plants have ten-year guarantee and the nuclear and hydro power plants have a twenty-year guarantee). The capacity payments are regulated fixed monthly payments. The capacity payments for new thermal power plants vary from 12500-30000 €/MW,month, depending on the type and location of the new power plant. The present capacity mechanism in Russia is meant to be temporary, and it is designed to solve the problem of the immediate need for new investments in the generation sector. In 2010-2015, 40 GW of new generation will be launched through this mechanism.

Old generators compete in Competitive Capacity Auctions organized by SO a year prior for each month of the following year. Before CCA, the market concentration in the zones of free power flow is observed by the Federal Antimonopoly Service. In case of high market concentration ( $HHI^{(*)} > 0.25$ ) the price caps are applied in CCA. In 2011, the price cap was applied in 26 out of 29 zones of free power flow. Generators submit bids of monthly offered capacity (MW/month) and price (Rub/MW,month). Capacity bids of generators, technical parameters of which meet the minimum requirements set and published by SO before CCAs, are under considerations only. The required volume of old generation capacity to be selected in the auctions is: the capacity demand in zone of free power flow minus the share of demand that is covered by capacities of new generators under CDA and LTA. The generators are selected starting from the cheapest. The last accepted capacity bid forms the capacity price of the CCA. The capacity prices formed in the CCAs is 3000-4000 €/MW,month. Generators receiving capacity payments should perform the full readiness to deliver the amount of electricity indicated in their accepted capacity bids. One of the criteria is checking the correspondence of volumes of electricity submitted to unit commitment procedure and day-ahead market and capacity accepted by the results of capacity market. If they deviate, it signals about the non fulfillment of obligations and therefore, the final capacity payments to that generator should be recalculated based on the actual capacity sell for the generator. Generators which are not selected in CCA can still participate in a day-ahead and balancing market.

Capacity payments paid to the generators are wholly collected from the consumption on a monthly basis. The total capacity payment for all new generators is allocated equally to all customers in one price zone of the market (market is divided into two price zones in proportion to their capacity demand). The capacity demand of the consumption is the average of the customer's daily peaks over a month. The total capacity payment for old generators located in one zone of free power flow is allocated equally to all consumers located in the same zone in proportion to their capacity demand.

Export is treated as a capacity demand. To export electricity to a neighbouring country during peak hours, exporter has to buy capacity from the capacity market. Two months before the capacity auction, exporter has to notify the SO about its planned capacity export (or maximum hourly electricity export during peak hours). Planned capacity export is taken into account when determining the overall capacity demand for a particular zone of free power flow. However, at the end of clearing period, actual obligations of the exporter is determined due to the possible deviations of the actual and planned capacity. Higher capacity prices are applied for deviation.

The participation of import in the capacity market is possible. In the CCAs, import competes with the old generation capacity. However, in order to receive capacity payments, import has to be available. In other words, the importer always has to be able to deliver the volume of electricity indicated in its accepted CCA bid.

(\*) HHI = Herfindahl-Hirschman Index