Open Joint-Stock Company
The *System Operator of Unified Power System*

CAPACITY MARKET

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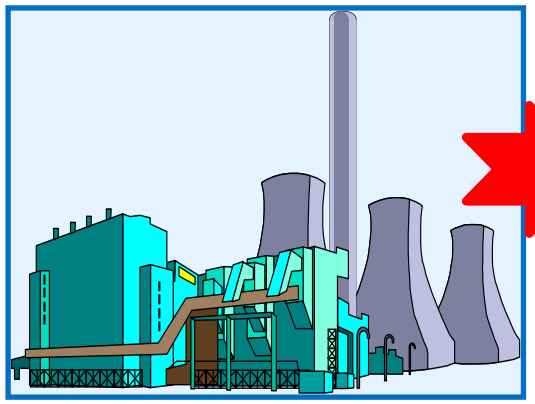
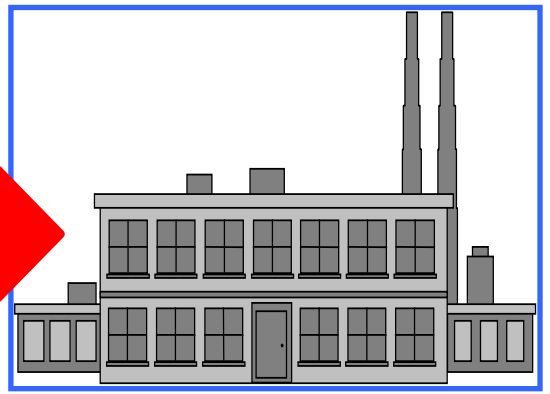
Capacity as a special commodity

Capacity is a special commodity in the wholesale market which, if sold, entails the obligation to maintain the generating equipment in a state of readiness for generation of electric power, including through the necessary repairs of the generating equipment, and a corresponding right to demand its proper performance in accordance with the conditions of signed contracts of sale (supply) of capacity.



Performance of the obligation by the supplier to sell (supply) capacity and to transfer capacity from the supplier to the buyer

Execution of customer commitments to purchase capacity and receive capacity from the supplier

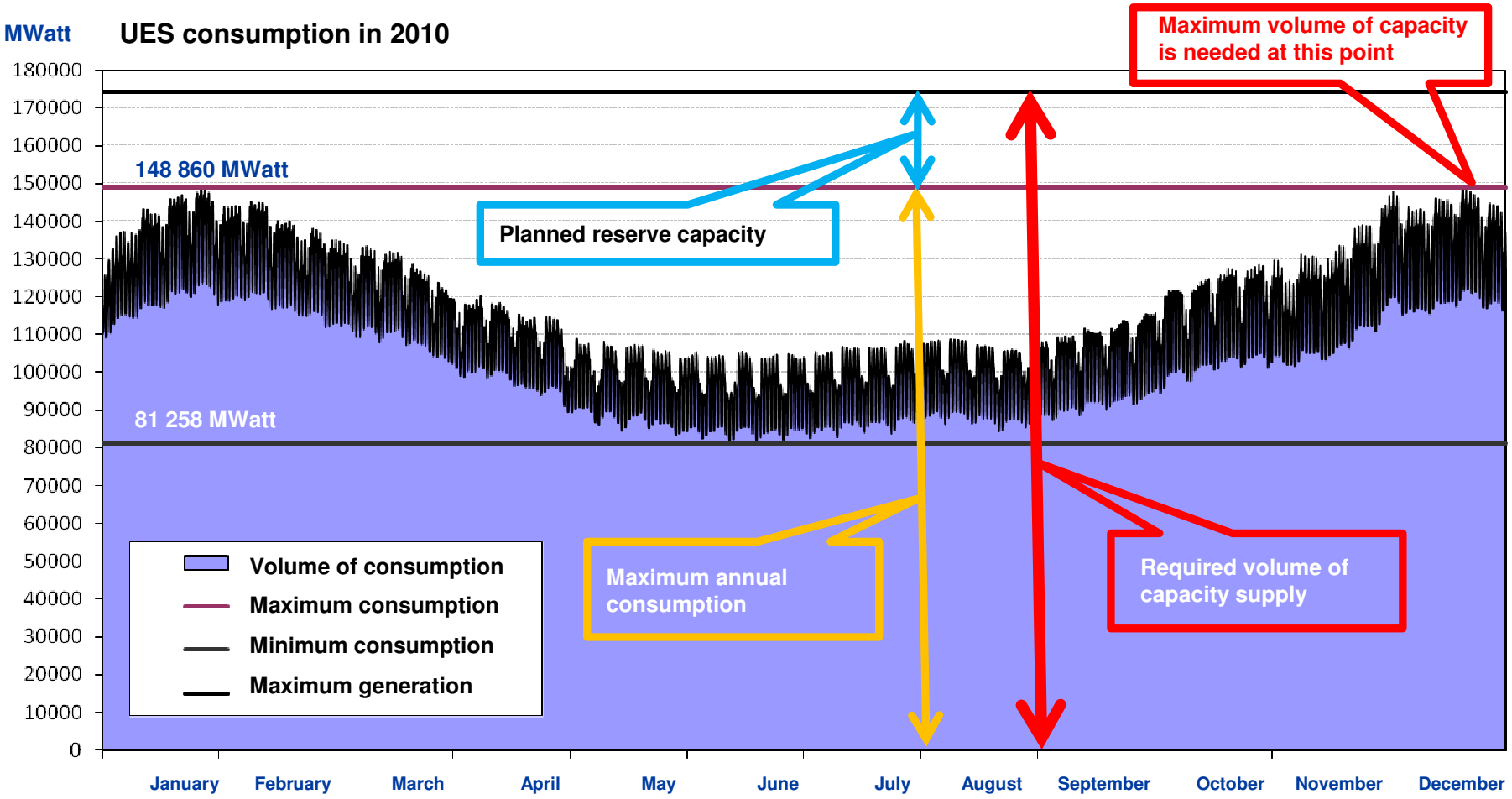


The economic sense of capacity: payment for capacity is the source of funding for conditionally fixed costs of suppliers required to maintain generating equipment in a working condition.

Required volume of capacity supply

The required volume of capacity supply for each month of the calendar year is set as the maximum hourly consumption in a year, considering the planned reserve factor.

For consumers, the volume of purchased capacity is determined every month based on the need to pay for the entire volume of supplied capacity.



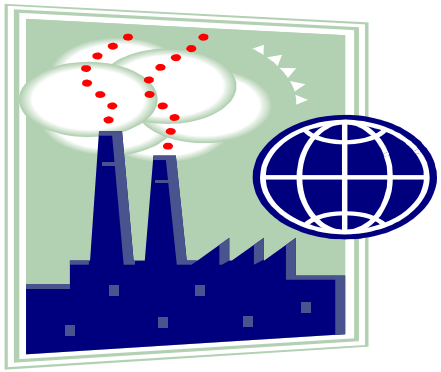
Supplier’s obligations to sell (supply) capacity

The obligations assumed by the supplier to sell (supply) capacity are measured as the volume actually supplied to the wholesale market, taking into account the requirements to the operational status of the equipment for electric power generation.

The volume of actual supply of capacity equals the maximum supplied volume less the volume of undersupplied capacity due to proven inability of the generating equipment to generate electric power.

The maximum volume of capacity supplied to the wholesale market is determined by results of certification, including certification on the basis of the generating equipment test results.

Generating equipment is recognized ready for electric power generation, if:



1. Participation in the total primary frequency regulation is ensured
2. Participation in the regulation of reactive electric power is ensured (voltage regulation)
3. Participation in the secondary frequency regulation and active power flows is ensured (for hydro power plants)
4. Technical requirements to the communication system providing communication with the system operator is ensured
5. The generating equipment is operating in accordance with the operational regime specified by the system operator

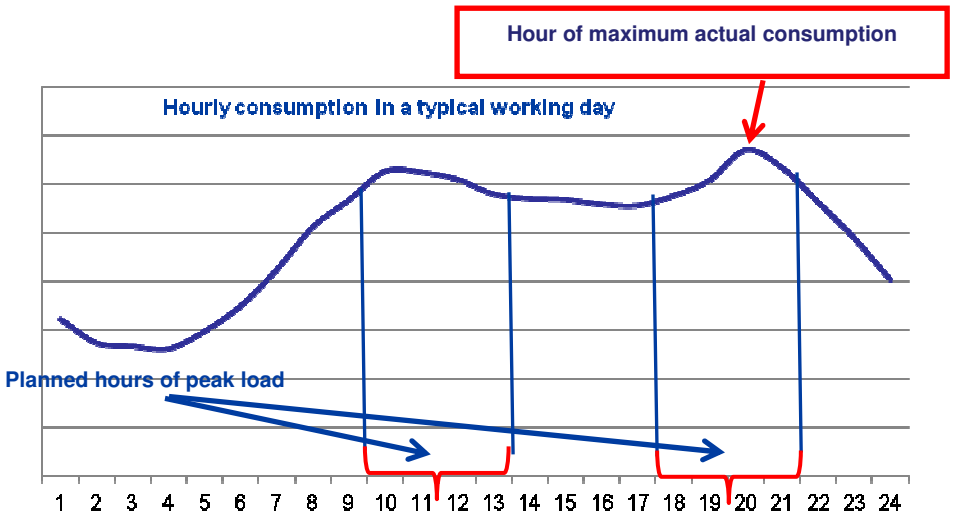
The volumes of undersupplied capacity (penalties for "unavailability") occur in the case of:

- actual capacity limitations;
- unscheduled/emergency repairs of equipment;
- registration of facts of non-participation in the regulation of frequency and/or voltage;
- registration of violations in dispatching discipline, including failures to comply with the dispatcher schedule;
- registration of facts of economic "withdrawal" of capacity from the market.

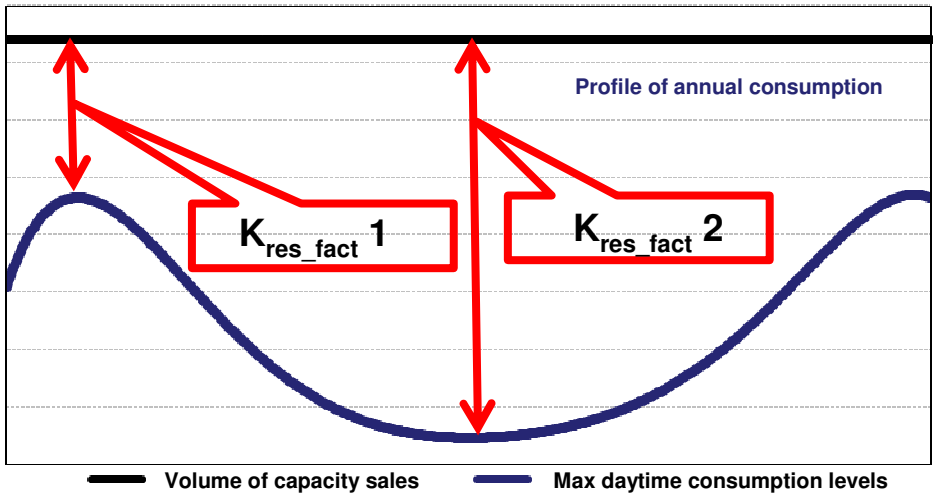
Fulfillment by the buyer of obligations to purchase capacity

Fulfillment by all buyers of obligations to purchase capacity is determined as the average volume equal to the coefficient of the actual availability of capacity times the amount of actual peak consumption over a corresponding month.

The volume of actual peak demand for each customer is determined as the monthly average weekday value of capacity corresponding to the maximum actual consumption of electrical power at any given hour of the day from the number of the system operator-assigned planned peak hours on weekdays.



The coefficient of the actual availability of capacity (K_{res_fact}) in the system (zone) is determined from the ratio of payable power actually supplied to the wholesale market, and the total peak consumption. Depending on the change in the volume the actual peak consumption, the ratio of actually available capacity is substantially different at various time intervals during the year.



Capacity market structure

Basic mechanisms of capacity market

Capacity sold as a result of competitive capacity outtake (CCO)

Sales of capacity in the selected CCO

Capacity of generating facilities, which signed CPC (capacity purchase contracts) + NPP and hydropower plant output

Sales of output of thermal power plants under long-term contracts.
Sales of NPP and hydroelectric power plants under conditions similar to CPC

Forced generation

Sales of capacity of generating facilities that are not selected in the CCO but required due to technological or other reasons

Other mechanisms of capacity market

Regulated contracts (RCs) and free contracts (FC) on the purchase and sales of capacity

Contracts of purchase/sale of electricity and/or capacity under tariffs set by Federal Tariff Service for electricity and (or) capacity (only for delivery to the population and equivalent categories of consumers) or the sales of capacity under signed free sale and purchase contracts (FC), provided that it is used under CCO

Contracts for the provision of capacity (CPC)

CPC is a commitment of the generating company for commissioning new facilities with installed capacity over the prescribed period, subject to guaranteed payment for commissioned capacity for a certain period

History of CPC:

- **During the reform of RAO UES of Russia, generating companies (OGK/TGK) were set up and controlling share packages were acquired by new owners during repurchase of additional issues**
- **The terms of sale of shares were set on the basis of the need to finance investment projects, the list of which was originally approved by the Board of RAO UES of Russia**
- **In 2008-2010, the terms and some parameters of the investment programs were finalized, and the PPC contracting system was established**
- **Under the terms similar to CPC, long-term supply contracts for new NPP and hydropower plants were signed in 2010.**

The obligation to execute CPC investment projects is supported by special control mechanisms for their implementation, and the contractual liability of the parties for non-fulfillment of their obligations. The Market Rules also contain a set of provisions stimulating CPC implementation.

CPC planned volume: approximately 41.2 GW
(30 GW of thermal power plants, 11.2 GW NPP + hydro)

Forced generation

Classification procedure

A generator can be classified as facilities which supply capacity in a forced mode, if it is not used under CCO, and:

- for technological reasons, decommissioning is suspended (risks of power or heat supply established)

or

- for price, social or other reasons, a decision is taken by the Government of the Russian Federation on the basis of proposals of the Government Commission on Electric Power Development

Payment terms

Taking into account projected financial results from the sale of electricity generated by all the generating facilities of the company, the following customers pay as per tariffs set by Federal Tariff Service:

- all customers located in the same FC zone, if the risks of power failure are established
- all customers located in the same subject of the Russian Federation, if there are risks of heat supply failures

- Recognition of the generating facility as a forced generating facility because of the risks of heat supply failures leading to higher rates for capacity consumers in the region
- The ceiling price increase is limited by the forecast for socio-economic development of the Russian Federation
- Facility decommissioning under the decision of the local government body is possible for a term not exceeding 3 years. The next step is to require the owner to put the facility on sale, and perform a buyout, if no purchasers are found

Suspended decommissioning due to regional heat supply risks is a critical regional management decision that should be based on heat supply schemes developed in accordance with the requirements of law 190-FZ

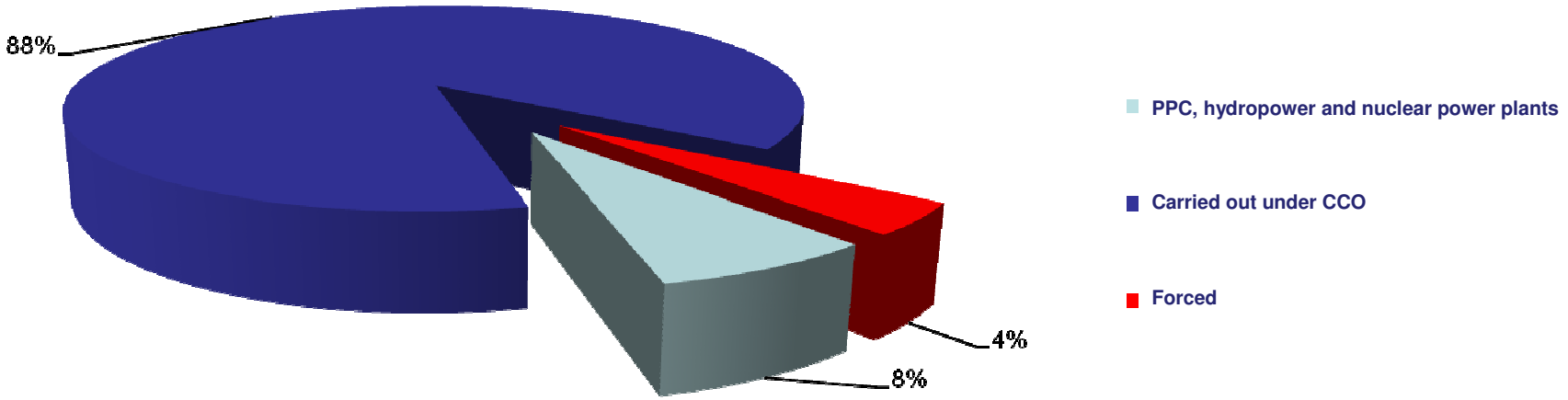
Competitive Capacity Outtake

Competitive capacity outtake (CCO) is carried out by system operator to ensure that volumes of generating capacity in the wholesale market are sufficient to meet the demand for electric power by the UES of Russia and the local power systems. CCO is carried out if limited competition is detected in the free flow zones under the established procedure

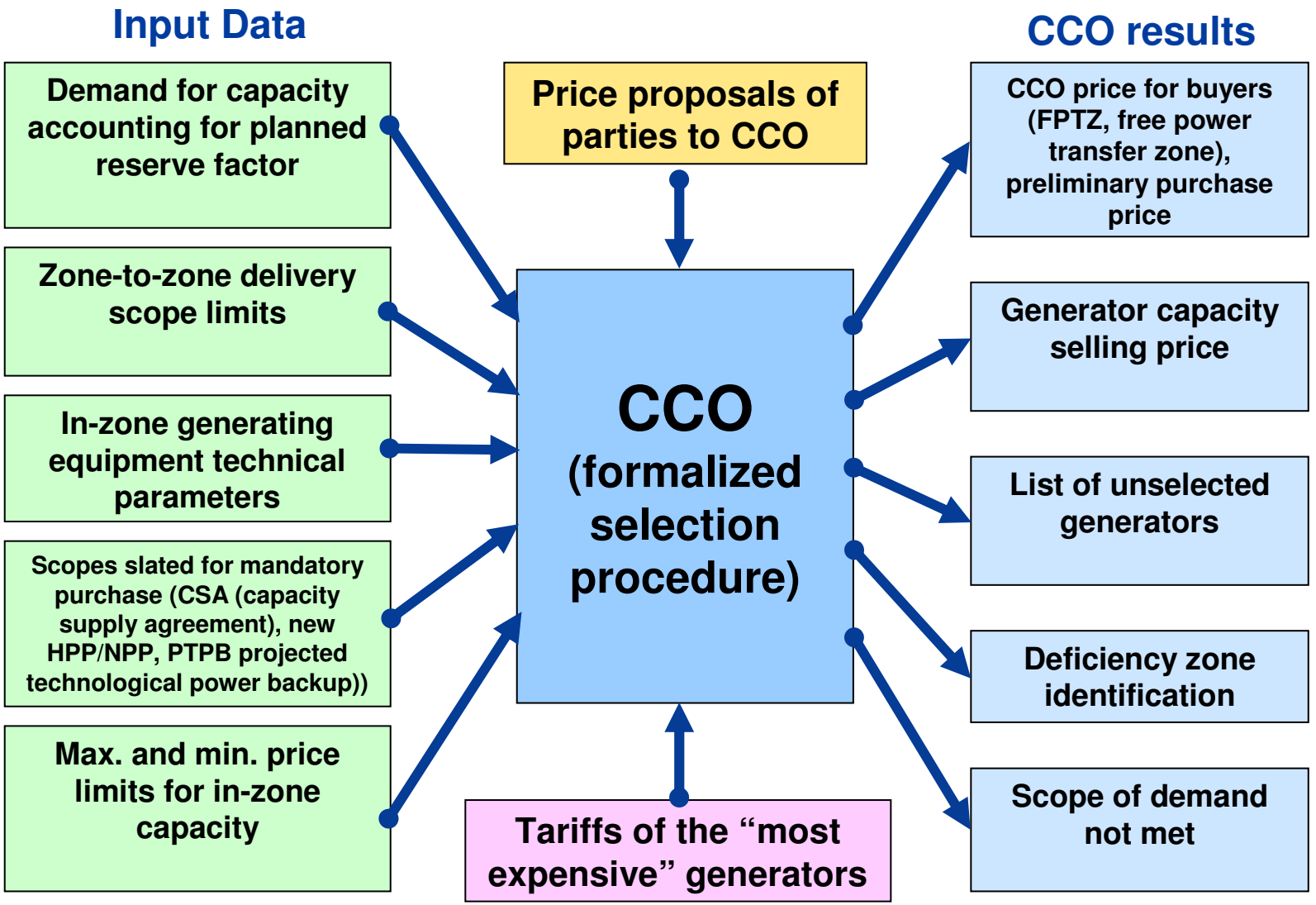
The system of competitive capacity outtake has been operational since 2008.

- In 2008, it was operational for six months, starting from 01.07.2008;
- In 2009, 2010, 2011 and 2012, CCO was planned for the following year;
- As of 2013, CCO is planned for the following four years.

Capacity sold in 2012 using various capacity sales systems



Competitive Capacity Outtake Procedure



Technical requirements for generating equipment to qualify for CCO

Acting regulations provide incentives for decommissioning obsolete or inefficient generating equipment at the phase of:

Qualifying for CCO – Suppliers whose equipment does not meet the requirements set are disqualified from passing through CCO procedures;

Selection – Technically superior equipment gets a higher priority during CCO candidate selection.

The following generating equipment is disqualified as part of CCO procedures as failing to meet the minimal technical procedures:

a) Equipment whose technical characteristics were flagged during the 2011 CCO procedures as falling below the minimal technical requirements set, with the exception of the equipment certified in 2010 and 2011 based on test results.

b) Equipment generating a fresh steam pressure of 9 MPa or less given that:

- in 2012 – the steam turbine was manufactured prior to 1952;
- in 2013 – the steam turbine was manufactured prior to 1956;
- in 2014 – the steam turbine was manufactured prior to 1958,
- in 2015 and subsequent years– the steam turbine was manufactured earlier than 55 years prior to CCO.

The exception is the steam turbines that underwent wheel space reconstruction and replacement of turbo generator main parts in 2010 – 2011.

Accounting for technical characteristics

The technical characteristics (parameters) of generating equipment announced by a party in its price proposal and accounted for as part of CCO procedures:

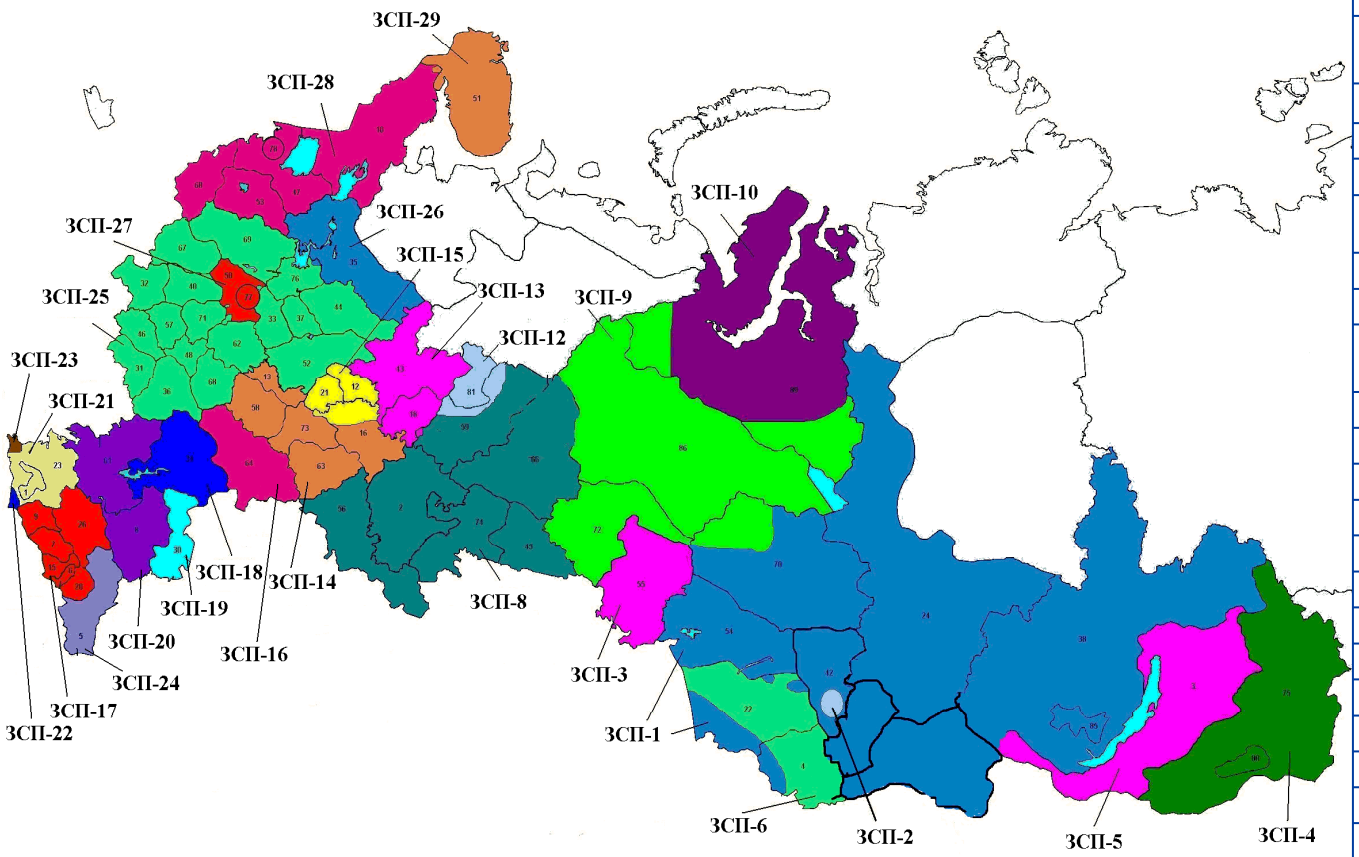
- **If the prices set in price proposals for the sales of capacity within one FPTZ are equal the following priorities are used in selection:**
  - **Priority 1 - readiness to operate in a peaking mode;**
  - **Priority 2 - broad power control range (a ratio of the upper and lower limits of the control range of generated to installed electrical capacity;**
  - **Priority 3 - large assured generation scope (a ratio of proposed assured generation to installed capacity)**

To determine optimal generating capacity scopes covering the demand for capacity within a FPTZ and account for technological limitations:

- **Limitations on the control range within a group of FPTZ within one price zone;**
- **Limitations on electrical energy generation scope within a FPTZ.**

Free transfer zones CCO 2012

Free electrical energy/capacity transfer zones



No.	FPTZ code	Constituents of the Russian Federation areas and power districts	FPTZ No.
1	FZSBOE01	Siberia	1
2	FZSBKZ02	Southern Kuzbass	2
3	FZSBOM03	Omsk	3
4	FZSBCH04	Chita	4
5	FZSBBU05	Buryatia	5
6	FZSBBB06	Altai	6
7	FZUROE07	Ural	8
8	FZURTU08	Tyumen	9
9	FZURNT09	Northern Tyumen	10
10	FZURPZ11	Perm	12
11	FZURKR12	Vyatka	13
12	FZVLOE13	Volga	14
13	FZVLKZ14	Kinderi	15
14	FZVLBS15	Balakovo	16
15	FZYUOE16	Caucasus	17
16	FZYUVG17	Volgograd	18
17	FZYUAS18	the Caspian	19
18	FZYURS19	Rostov	20
19	FZYUKU20	Kuban	21
20	FZYUSK21	Sochi	22
21	FZYUSO22	Gelendzhik	23
22	FZYUDA23	Dagestan	24
23	FZZNOE24	Central	25
24	FZZNVL25	Vologda	26
25	FZZMSK26	Moscow	27
26	FZSZOE27	Western	28
27	FZSZKO28	Kola	29

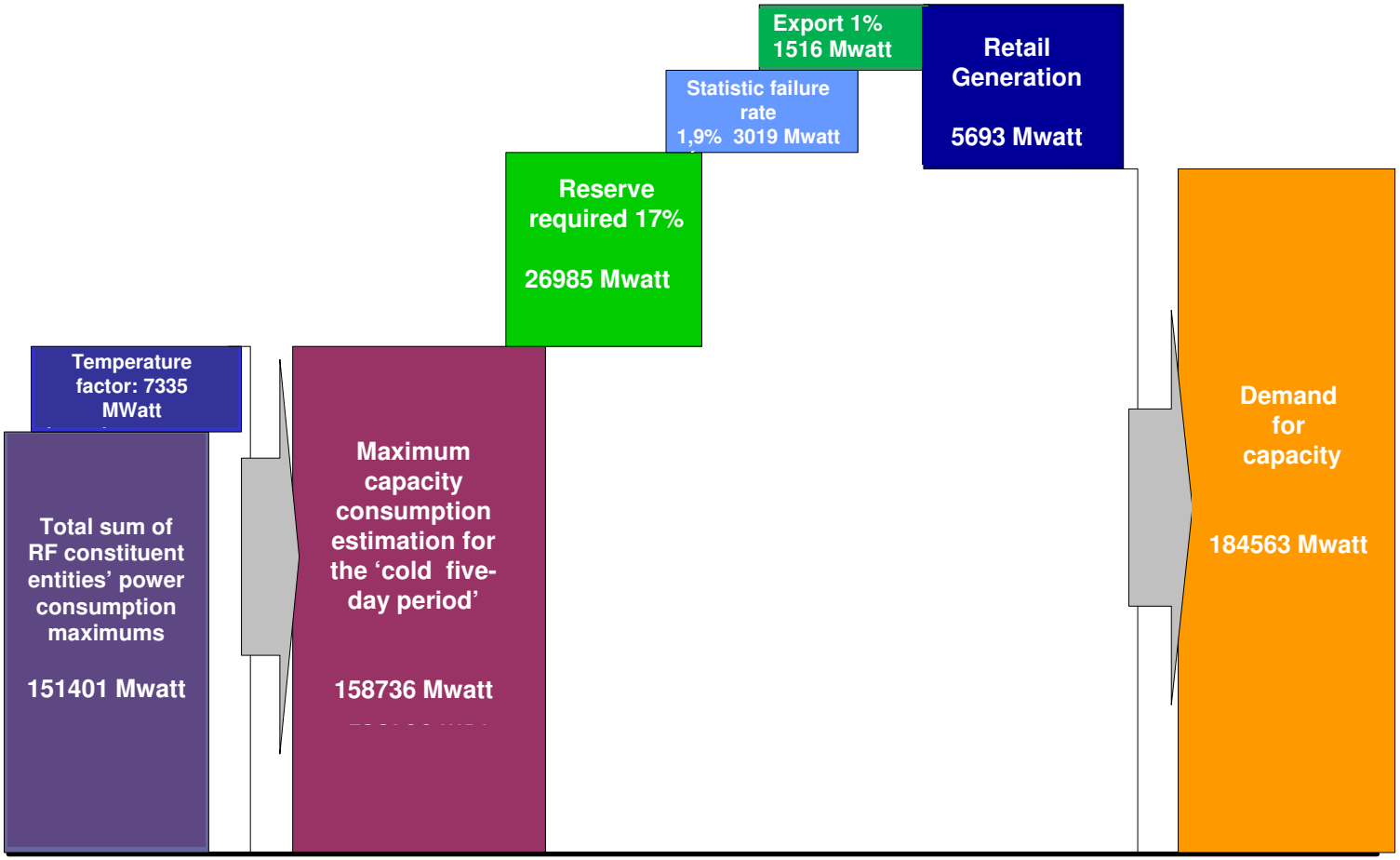
Procedure for calculating the demand for capacity:

- The demand for capacity is estimated proceeding from:
  - Projected consumption during a “cold” five-day stretch;
  - Projected backup factor;
  - Minus the scope of retail generation.

- Projected reserve factor is estimated proceeding from:
  - Normative reserves for all price zones;
  - A factor introduced to account for projected capacity underutilization due to unscheduled maintenance;
  - A factor introduced to account power export.

Capacity demand calculation CCO 2011

1+2 Price Zone UES of Russia



Main results of CCO 2012

Scope indicators) MWt, available capacity)

	Demand	Supply	Selected				Not selected			Demand not covered by CCO
			Total	Incl. selected by CCO price	Incl. CSA and new NPP/HPP	Incl. 15% of most expensive	At price	Decomis-sioning banned prior to CCO	Does not conform to technical requirements	
1 ЦЗ	144 441	147 515	143 827	123 179	12 094	8 555	1 081	1 280	1 327	2 018
2 ЦЗ	39 210	38 181	34 056	27 570	1 681	4 805	2 540	1 350	235	1 676
Итого	183 651	185 696	177 883	150 748	13 775	13 360	3 621	2 630	1 562	3 694

Besides:

- **39 generating units with installed capacity of 253 MWt have not applied for CCO**
- **35 generating units with a capacity of 958 MWt were decommissioned during 2011**

Price indicators (rubles/MWt per month)

FPTZ Tsentr	118 100
FPTZ Ural	118 118
All other FPTZs of 1st Price Zone	118 125

FPTZ Sibir	146 788
All other FPTZs of 2 Price Zone	126 368

Results of CCO 2012

Results of selection by technical parameters CCO 2012:

- **requirements for limitation of relative control range:**

  1 price zone - 32.2% (normative requirement - 35.7%)

  2 price zone not complied with - 61.3% (normative requirement - 38.6%)

  In compliance with

- **requirement for limiting scope of generation complied with in all FPTZs**

Total scope of demand not covered as part of CCO in 2012 is 3694 MWt:

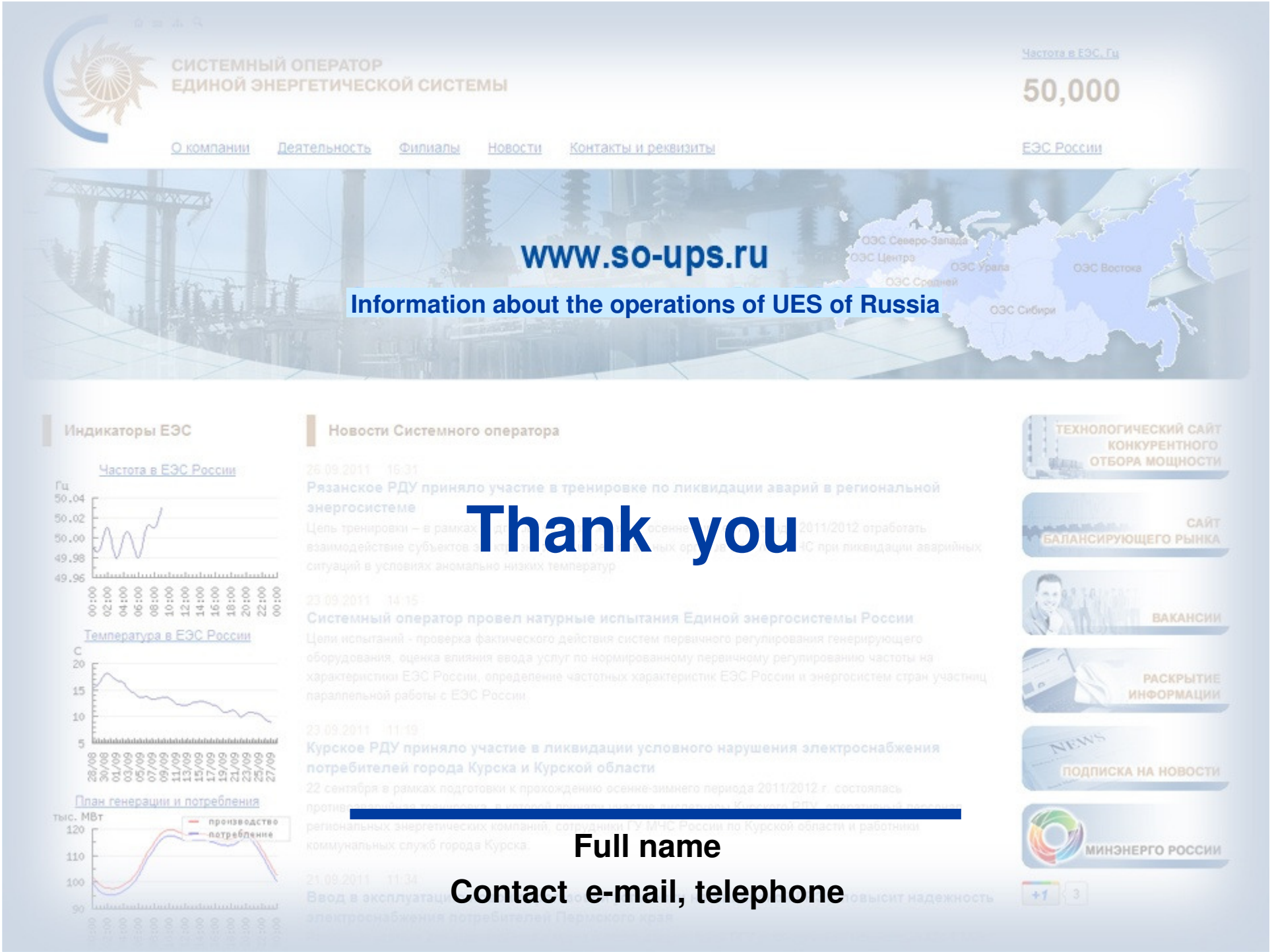
1 price zone – 2018 MWt (limited by transfer to FPTZ (27) Moscow

2 price zone – 1676 MWt (limited by transfer to 2 price zone).

The total "physical" excess of projected capacity- 2045 MWt of which 1562 MWt the scope of capacity of generating equipment which technically does not qualify for CCO in 2012.

In conducting CCO in 2012 556 MWt was taken off to comply with the Rules of the Wholesale Market whereby a whole generating electrical capacity must be selected and the technical parameters of all generating capacities selected in the 1 price zone must be accounted for.

A plan is under review now for specifying a procedure for individual tenders for the construction of generating facilities (new power plants) where there is technological demand for new generating capacity.



Thank you

Full name

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