PRODUCTION CAPITAL FORMATION

NETWORK EXPLOITATION

2014-2016 TIMELINE OF THE COMPANY'S CORE PRODUCTION ASSETS

Assets	M.u.	2014	2015	2016
6-220 kV substations	pcs	31,103	31,716	32,068
Total capacity installed	MVA	30,167	30,393	30,611
35-220 kV substations	pcs	1,042	1,042	1,048
	MVA	21,612	21,639	21,738
6-10(35)/0.4 kV transformer substations	pcs	30,041	30,658	31,002
	MVA	8,555	8,754	8,873
6-10 kV distribution stations	pcs	20	16	18
0.4-10 kV aerial power lines	km	117,943	119,251	120,206
220 kV and over 220 kV	km	27	27	27
110-150 kV	km	18,105	18,138	18,131
35 kV	km	8,109	8,059	8,061
6-10 kV	km	50,548	50,831	51,004
0.4 kV	km	41,154	42,196	42,983
0.4-110 kV cable power lines	km	6,103	6,365	6,476
220 kV and over 220 kV	km	-	-	-
110 kV	km	68	76	77
35 kV	km	109	110	110
6-10 kV	km	3,500	3,662	3,736
0.4 kV	km	2,426	2,517	2,553

Build-up of the Production Asset Management System (schedule period for implementation: 2016-2018)

The Production Asset Management System (PAMS) is a control system for asset management, liable for generation of management policy, goals and processes. The system regulates and coordinates performance of the Company, managing physical assets and performance profile in such a manner so as to find appropriate balance between costs and regulatory compliance and reach strategic targets.

Key goals are:

- Integration of existing metering devices into the centralized system.
- Intensification of production-related operating and investment expenses;
- Securing a long-term transparent tariff mechanism, based on Reliability/Expenses ratio;
- Control over achievement of a specified supply reliability.

Key objectives:

- Development and alignment of organizational and regulatory base for production asset management;
- Liberalization of regulatory and technical documentation regarding changes in facility repair and maintenance cycles depending on health of equipment and power lines;
- Coherent transition from the plan-and-prevent system to the system of health-based asset management, with allowances made for breakage risks;
- Automation of the PAMS core and supporting processes.

Target goal:

- Rationalization of investment decisions, enhancement of return on investments and efficient enforcement of cost allocation, evaluation of risks, network development prospects, load and equipment life;
- Cutdown of the Company's material losses, driven by decreased recovery and unscheduled works, emergency destocking, optimization of the man-loading schedule;
- Enforcement of operational transparency;
- Increased fidelity of data on asset health, flexibility and availability of third-party information.

In 2016 we have launched the following functions of the "Repair and Maintenance" process control system:

- Scheduling of repair program works and resources;
- Calculation of repair program expenses;
- Planning of physical quantity, expenses and resources for maintenance, diagnostics, expert examination and survey.

Repair orders for the 2017 repair program were generated in the "Repair and Maintenance" process control system with due regard to equipment health and breakage consequences. The share of the core equipment, covered by the 2017 repair program, totaled 100%. Repair programs of the branches are prepared with the aid of the single material and equipment guide. Motor vehicles, buildings and installations were classified in line with single classifiers and guides. Implementation of the "Repair and Maintenance" process control system enforces feasibility of decisions, quick access to sources information, enhanced planning quality, oversight of resource use, analysis of planning quality and expenditures.

System-to-system integration:

1. Automation of digital certification of substations and power lines to be used by the geographical information system (GIS).

2. Integration of the PAMS with "Incidents" software solution.

3. Design of the equipment defect register, implemented in line with the Rosseti's typical specification for defect register automation.

The integration enables:

i) to display data in the shared system;

ii) to record technological disturbances and technical arrangements carried on the equipment, fostering better quality of the repair and maintenance program scheduling;

iii) to form reports on investigation of technological disturbances, based on the PAMS data base and on-line information transmission;

iv) to avoid manual data input and data redundancy in several information systems;

v) to minimize influence of human factors on data transfer.

Reports on weekly and quarterly repair and maintenance plans are generated automatically upon orders helping minimize human factors and burden and enhance data integrity. As of the year-end the automated reporting service has been running in a test mode.

As of 01.01.2017:

- 2,258,392 core equipment units have been digitally certified;
- HIC (Health Index Calculation) service for substations and relevant equipment has been launched, the index being applied to 72,325 equipment units;
- Network topology has been formed;
- Prioritizing registers on 10,725 equipment units have been formed;
- Breakage Consequences Evaluation Methodology have been implemented;
- The 2017 repair program has been formed by the "Repair and Maintenance" process control system.

The launch of the system and transition to scheduling of equipment impacts factoring health of equipment and consequences of breakage will intensify technical impacts and maintain equipment on the back of optimal spending.

REPAIR PROGRAM

	Target value, RUB million	Real value, RUB million	Percentage completion
Permenergo branch	681	719	106%
Sverdlovenergo branch	572	582	102%
Chelyabenergo branch	456	473	104%
IDGC of Urals (plus HQ)	**1,711**	**1,779**	**104%**

The repair target value for 2016 was RUB 1,711 million. Real expenses in 2016 totaled RUB 1,779 million or 104% on the targets. The overrun was mainly influenced by recovery and unscheduled works. Total repair costs of the Company's branches in 2016 totaled RUB 379 million or 21% (outsourcing) and RUB 1,400 million or 79% (in-house).

Description	2012	2013	2014	2015	2016
Power line overhaul, km	10,400	11,300	10,582	10,420	10,201
Power line corridor clearing, ha	7,178	7,407	11,625	11,414	10,825
Transformer overhaul, pcs.	54	55	40	33	41
Switching unit overhaul, pcs	3,370	3,462	3,216	3,125	2,966
Total repair costs, RUB	1,364	1,578	1,598	1,746	1,779

Repair scope was impacted by habitual activities based on repair cycles. We intensified power line corridor clearing since 2014 to end up with 5.5-year clearing cycle. The repair target value for 2017 is RUB 1,809 million or +2% YoY, with RUB 1,401 million (77%) to be spent on in-house works and RUB 408 million (23%) to be spent on outsourcing.

ADAPTION TO SPECIAL PERIOD OPERATIONS

With a view to provide stable operations of the grid facilities during the thunderstorm season the Company issued the decree[6] stipulating a package of compulsory and supportive measures to be enforced. The decree covered 9 organizational measures, 11 technical arrangements and 16 measures to increase lightning-surge proofness of the grid facilities to be implemented during the year. To ease negative impacts of thunder strokes on substations and consumer equipment our plans were to continue clearing and widening of the corridors, to replace defective ground wires, porcelain and defective insulators, bare cable (for SIP), valve-type arresters (for surge suppressors) and to conduct thermovision and ultraviolet inspections of suspended insulation. All scheduled compulsory and supportive measures were completed.

With a view to provide stable operations of the grid facilities during the flood period the Company issued the decree[7] and prepared registers of 35-110kV substations, sections of 6-110 kV aerial and cable power lines transformers, located in flood hazard zones, and grid facilities to be potentially cut off by the flood water from the road infrastructure. 30 substations, 16 distribution stations, 98 transformer substations, 2 buildings, 10 cable power lines (3 cable power lines and 7 cable ducts), 765 0.4-10 kV aerial power lines, 265 35-110 kV aerial power lines were registered as equipment under extreme danger. We enhanced monitoring of these facilities until the flood water subsided. We scheduled 28 compulsory measures and 741 supportive measures to provide stable operations of the grid facilities during the flood period. All measures were completed on time.

With a view to provide stable operations of the grid facilities during the fire season the Company issued the decree[8] stipulating 88 organizational and technical arrangements to enforce fire safety. All measures were completed. During the fire season our branches have not introduced special fire-related modes of operations. Analysis of incidents, compared YoY, demonstrates plateauing of fire events covered by incident investigation reports.

2016/2017 autumn-winter operations mirrored the previous periods, all systems operated within the normal organizational and technical range. The weather conditions were stable and had no serious impact on operations of the Company's grid facilities. The Company's personnel showed excellent abilities and skills to recover damaged facilities within the minimum period of time.

All resources and means of the Company's recovery subsystem were used to provide stable 2015/2016 autumn-winter operations. All material resources were used to achieve the set objectives. Control bodies, recovery forces, equipped with vehicles, equipment and telecommunication means have coped with the tasks. Technical disturbances of 2015/2016 autumn-winter operations decreased 34.1% YoY. All branches of the Company and EESK reported disturbance quantity reduction, with maximum technological disturbance decrease of 40.5% in our Chelyabenergo branch.

During the reported period every operating employee had quarterly emergency response drills. All scheduled drills were conducted. Alongside with this, backup power stations underwent equipment operation tests.

Recovery resources of the Company are presented below:

1. Mobile recovery teams, able to travel long distances (up to 1,500 km) to neighboring production units, branches, EESK, IDGCs, energy systems: 51 teams (287 workers and 106 vehicles and machinery).

2. Own recovery teams in production units:

- 662 teams (3,350 workers, 1,451 vehicle and machinery);
- 190 "on duty" teams (630 workers, 185 vehicle and machinery);

3. Outsourcing teams:

- 125 teams (1,251 workers, 245 vehicle and machinery).

4. Backup power stations owned by the Company: 56 stations with capacity of ≥ 30 kW.

5. Emergency supply: fully stocked, overall value of RUB 268.236 million. We have all required equipment and materials to restore power lines of any voltage class, substations, transformers, RPA and DOCS devices.

PROPERTY PORTFOLIO MANAGEMENT

	Physical terms: Aerial and cable power lines (km); substations and other facilities (pcs)	Book (residual) value as of 01.01.2016 (RUB thousand)	In 01.01.2016 -31.12.2016 (RUB thousand)	Out 01.01.2016 –31.12.2016 (RUB thousand)	Charged amorti-zation 01.01.2016– 31.12.2016 (RUB thousand)	Book (residual) value as of 31.12.2016 (RUB thousand)
Assets, classified as grid facilities, namely:		**43,005,358**	**6,360,160**	**78,275**	**5,092,494**	**44,194,749**
220 kV and above aerial power lines	49	221,591	0	0	50,177	171,414
110 kV aerial power lines	25,976	8,981,514	510,844	2,201	825,470	8,664,687
35 kV aerial power lines	9,228	1,238,382	71,953	138	117,455	1,192,742
10 Kv and below aerial power lines	94,138	7,874,753	2,615,995	24,942	2,028,822	8,436,984
220 kV and above substations	3	293,376	0	0	46,768	246,608
110 kV substations	636	5,055,903	389,630	10,456	613,514	4,821,563
35 kV substations	409	824,232	114,321	270	113,854	824,429
10 kV and below substations	30,749	5,978,750	2,139,398	17,028	718,658	7,382,462
Cable power lines (all voltage classes)	6,476	6,438,898	122,629	7,636	237,287	6,316,604
Other assets, designed for electric connection		6,097,959	395,390	15,604	340,489	6,137,256
Non-core assets enlisted in the non-core asset register	**44**	**136,672**	**6,295**	**4,044**	**3,991**	**134,933**
Other assets, namely:		**4,860,156**	**573,974**	**51,765**	**1,019,830**	**4,362,534**
Owned land plots	465	79,352	568	0	0	79,920
Fixed assets (line in the balance sheet)		**48,002,186**	**6,940,429**	**134,084**	**6,116,315**	**48,692,216**
Rented assets, classified as grid facilities, namely:		**1,602,014**	**2,564,368**	**1,111,793**	**1,300**	**3,053,289**
220 kV and above aerial power lines	3	1,254	0	0	0	1,254
110 kV aerial power lines	93	7,815	27,910	7,678	0	28,047
35 kV aerial power lines	46	2,076	0	0	20	2,056
10 Kv and below aerial power lines	4,776	248,557	60,999	35,266	353	273,937
220 kV and above substations	1	26	116,123	0	0	116,149
110 kV substations	19	31,418	101,833	0	0	133,251
35 kV substations	7	369	0	0	21	348
10 kV and below substations	2,124	888,355	1,894,501	959,713	582	1,822,561
Cable power lines (all voltage classes)	2,577	312,621	140,964	87,450	206	365,929
Other rented assets, designed for electric connection		**109,522**	**222,038**	**21,686**	**118**	**309,756**
Other rented assets, namely:		**4,219,268**	**860,427**	**369,615**	**0**	**4,710,080**
Land plots	23,762	3,484,267	831,998	324,508	0	3,991,757
Assets, used under leasing agreements, classified as grid facilities, namely:		**0**	**0**	**0**	**0**	**0**
Total rented assets, including those used under leasing agreements		**5,821,282**	**3,424,795**	**1,481,408**	**1,300**	**7,763,369**
TOTAL		**53,823,468**	**10,365,224**	**1,615,492**	**6,117,615**	**56,455,585**

SALE OF NON-CORE ASSETS

Asset	Book value, RUB thousand	Real sales value, RUB thousand	Spread, RUB thousand	Factors of the spread between the real sales value and book value of the asset
Apartment located at: 6-38 Ulitsa Bankovskaya, Artemovsky, the Sverdlovsk region	481,53	363,60	-117,93	The sales value was determined with allowances for discounts, compliant with the Company's Regulations on Management of Housing and Utilities Facilities
Karat motor vessel	3,562,00	2,161,78	-1,400,22	The sales value was defined as a result of the sale arranged as a public offer.
1-story all-brick garage located at Kizel	0,00	270,18	270,18	The sales value was defined as a result of the sale arranged as a public offer.
Energy Service Company of the Urals (100% of the charter capital)	5,000,00	0,00	-5,000,00	The asset was struck off the Company's balance sheet as it completed its voluntary liquidation and expulsion from the USRLE
Insurance Company "The Ring of the Urals" (7.4% interest)	0,00	0,00	0,00	The asset was struck off the Company's balance sheet as it completed its voluntary liquidation and expulsion from the USRLE

CONSOLIDATION OF GRID ASSETS

The 2016-2018 Grid Asset Consolidation Program of the Company was adopted by the Board of Directors[9]. The aim of the program is to shape a united grid area on the territory of the Company's operations and create single point of responsibility for reliable and high quality electricity supply and connection of new consumers to the consolidated networks. Rental contracts, voluntary transfer of ownership or free use and other kinds of consolidation were primary means of grid asset consolidation in 2016.

Implementation of the program

	Consolidation of grid assets								
	2014			2015			2016		
	MVA	km	c.u.	MVA	km	c.u.	MVA	km	c.u.
IDGC of Urals, namely:	**1,557**	**4,321**	**28,728**	**1,684**	**4,806**	**31,321**	**2,158**	**5,666**	**38,232**
Acquisition of grid facilities	40	22	305	6	29	183	34	40	352
Rented grid facilities	1,482	3,345	23,776	1,649	3,832	26,587	2,103	5,397	37,243
Other (permanent rights of ownership and use)	6	41	112	0	3	9	13	103	329
Other (temporary rights of ownership and use)	29	913	4,535	29	942	4,543	8	126	308
Sverdlovenergo branch	**607**	**1,698**	**12,976**	**560**	**1,711**	**12,712**	**526**	**2,236**	**16,491**
Acquisition of grid facilities	40	22	305	5	28	123	32	0	279
Rented grid facilities	567	1,653	12,620	555	1,683	12,589	489	2,205	16,109
Other (permanent rights of ownership and use)		23	51				5	20	78
Other (temporary rights of ownership and use)							0	11	25
Permenergo branch	**916**	**1,797**	**13,339**	**1,095**	**2,267**	**16,154**	**1,284**	**2,408**	**18,138**
Acquisition of grid facilities				1,3	1,1	60,0	0	37	48
Rented grid facilities	887	883	8,799	1,065	1,324	11,552	1,281	2,319	17,953
Other (permanent rights of ownership and use)	0,4	1,0	5,2				3	52	137
Other (temporary rights of ownership and use)	29	913	4,535	29	942	4,543	0	0	0
Chelyabenergo branch	**34**	**826**	**2,412**	**28**	**828**	**2,455**	**348**	**1,022**	**3,603**
Acquisition of grid facilities							2	3	25
Rented grid facilities	28	809	2,356	28	825	2,446	333	873	3,181
Other (permanent rights of ownership and use)	5	17	56	0,04	3	9	5	31	114
Other (temporary rights of ownership and use)							8	115	283

NOTES:
Acquisition – all grid assets acquired during the reported period;
Rentals – all grid assets, rented as of the year-end (i.e. all running contracts, incl. contracts concluded earlier, transactions in force as of the year-end);
Other (permanent rights of ownership and use) — all property acquired during the calendar period;
Other (temporary rights of ownership and use) – all running contracts as of the year-end, incl. contracts concluded earlier.

During the reported period we have closed a number of deals to improve operability of grid facilities and to lessen future connection costs. In the course of interaction with proprietors or other legal owners of network facilities, inconsistent with the RGO criteria embodied by the government decree[10] (with regard to the transfer of grid asset management functions), we analyzed consolidation of these assets in terms of feasibility, found a range of network assets attractive to us and negotiated consolidation prospects with the owners.

Some of the assets owned by the RGOs were consolidated. Prevailing part of proprietors intends to reap benefits as RGOs further on, presenting inconsistent conditions for asset transfer.