



РОСЭНЕРГОАТОМ

ЭЛЕКТРОЭНЕРГЕТИЧЕСКИЙ ДИВИЗИОН РОСАТОМА

International Scientific and Technical Conference

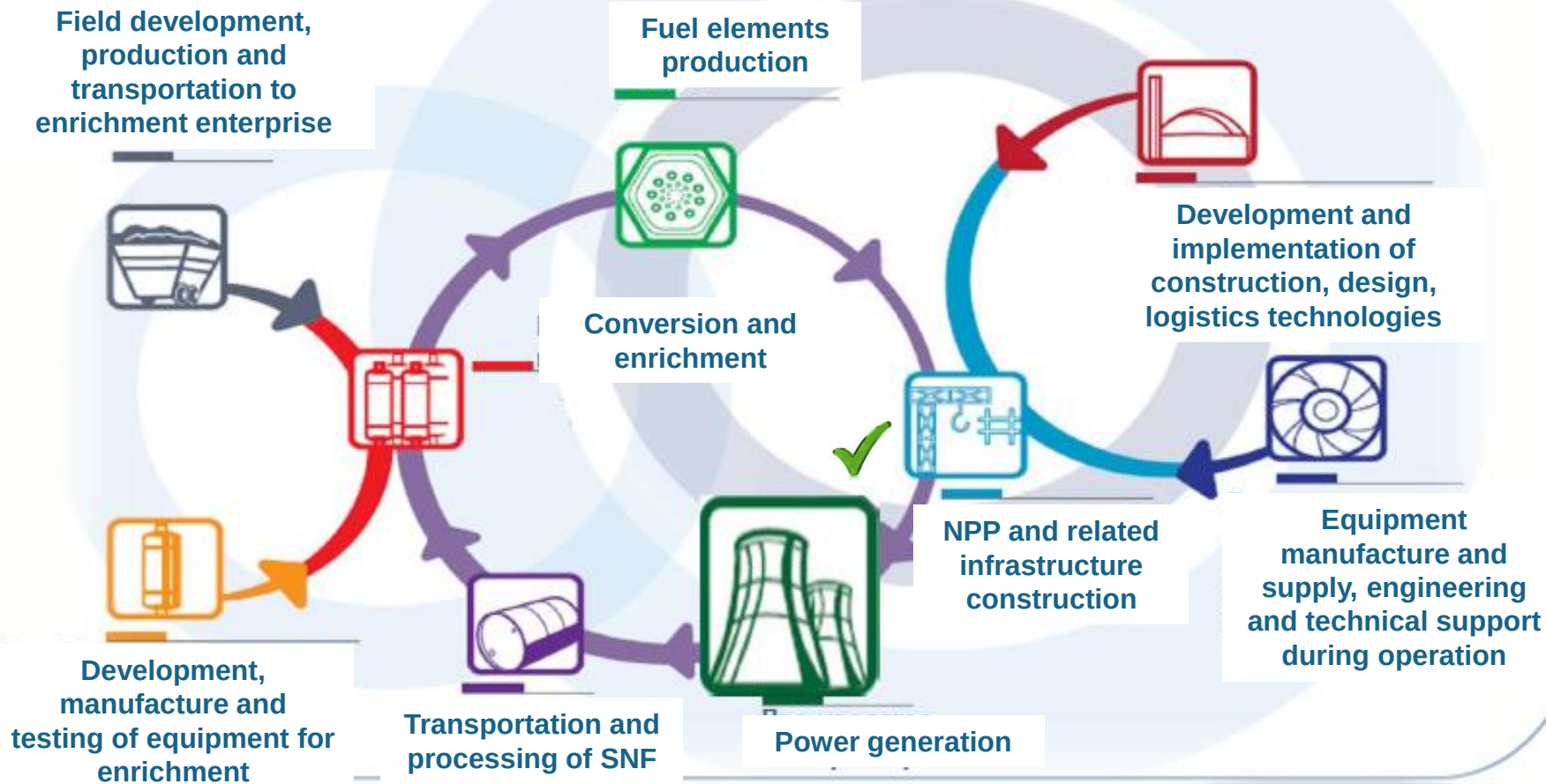
- 1. Economic development strategy of
Rosenergoatom Concern JSC**
- 2. Round table. Section "Economics"**

Deputy Director General of Rosenergoatom Concern OJSC - Director for
Economy and Finance
S.A. Migalin, May 2016

Role of Rosenergoatom Concern in value creation of State Corporation "Rosatom"



Regulatory body – state regulation of safety in using nuclear energy



Electric Power Division of State Corporation "Rosatom"

State Corporation "Rosatom"

Back-End

Mining

Fuel

Mechanical Engineering

Electric Power

Safety

Engineering

Science and Innovations

Advanced materials and technologies

Isotopic

Administration and maintenance, service infrastructure

Other Divisions



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АТОМЭНЕРГОРЕМОНТ



РОСЭНЕРГОАТОМ
АТОМЭНЕРГОСБЫТ



РУСАТОМСЕРВИС

REA Concern
man.comp. of
Atomenergoremont

Atomenergobyt

Atomenergopromsbyt

Atomtekhenergo

ZAES

VNIIAES

Atomtekhexport

Rusatom Service

Major activities of enterprises

Production of Electric and Thermal Energy at Nuclear Power Plants

Organization of maintenance, M&R, modernization, extension of service life of NPP systems and equipment

Reliable electricity and power supplier. Management of Municipal Engineering projects at subsidiaries

AtomTeploElectroSet and Atomteplosbyt
Sales of electricity and power on wholesale markets. Excluded by State Corporation from Division
Full package of works for commissioning of NPP systems and equipment including installation and commissioning works

Equipment and fuel quality control for Concern and abroad

Support of NPP design solutions and commissioning. R&D (VVER-TOI), Automated Process control systems excluded
NPP maintenance abroad, development of technical documentation. Engineering and technical support

Operating services for NPPs abroad (Armenia, Bulgaria, Iran)

Rosenergoatom Concern OJSC

One of the largest enterprises in Russian electric power industry, the only company in Russia functioning as an NPP operating company (operator).

- ✓ **10** NPPs
- ✓ **34** power units
- ✓ **26.2** GW
- ✓ **6** power units under construction
- ✓ **1** power unit under construction for floating NPP

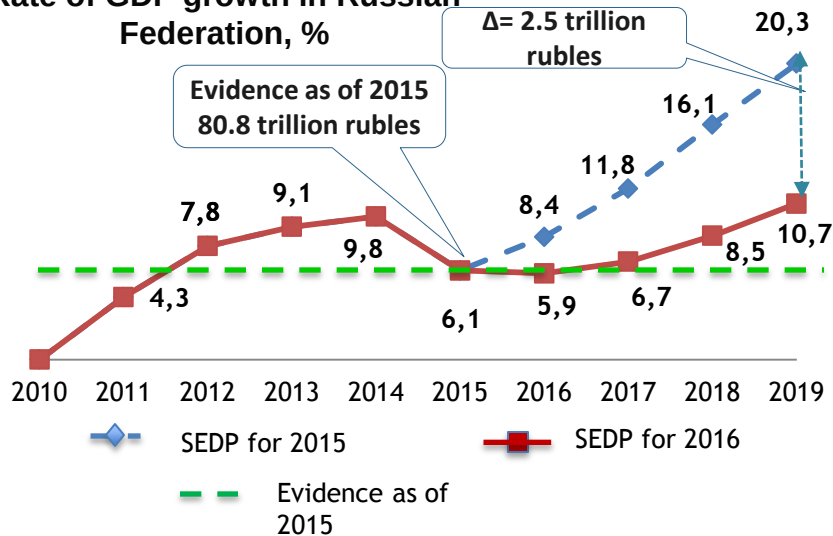


Key events and achievements in 2015

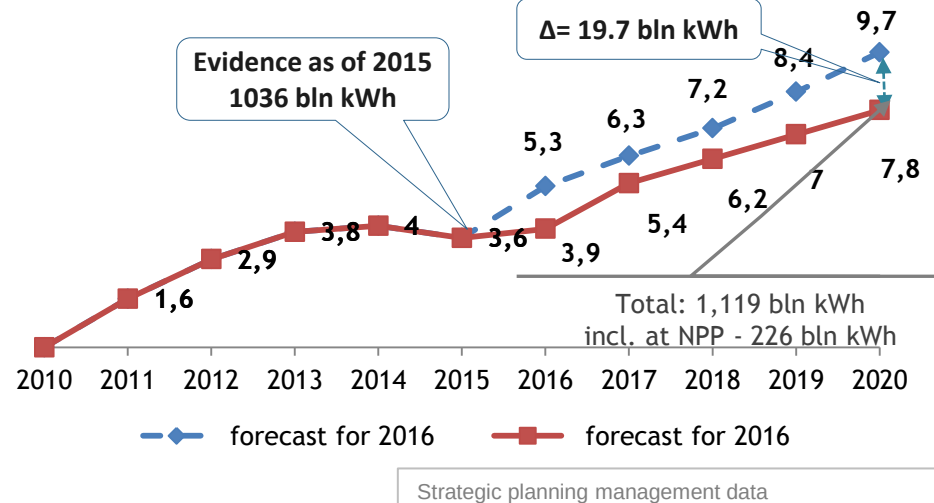
- ✓ 195.2 bln kWh generated in 2015, which made up 103.2% of the FAS balance. The company became the leading Russian company in power generation
- ✓ NPP generation share in Russia's power balance - 18.6%, which exceeded the 2014 indicator by 8.1%
- ✓ Commissioning of unit No.3 of Rostov NPP and power start-up of unit N. 4 at Beloyarsk NPP with unique BN-800 reactor
- ✓ Additional costs reduction by 3.3 bln rubles was provided by achievement of the strategic KPI "Specific semi-fixed costs" in relation to plan

Significant deceleration of economic growth rate since 2014 (2014 level recovery by 2018)

Rate of GDP growth in Russian Federation, %



Power consumption growth, %



Surplus power increase in the Unified Energy System of the Russian Federation

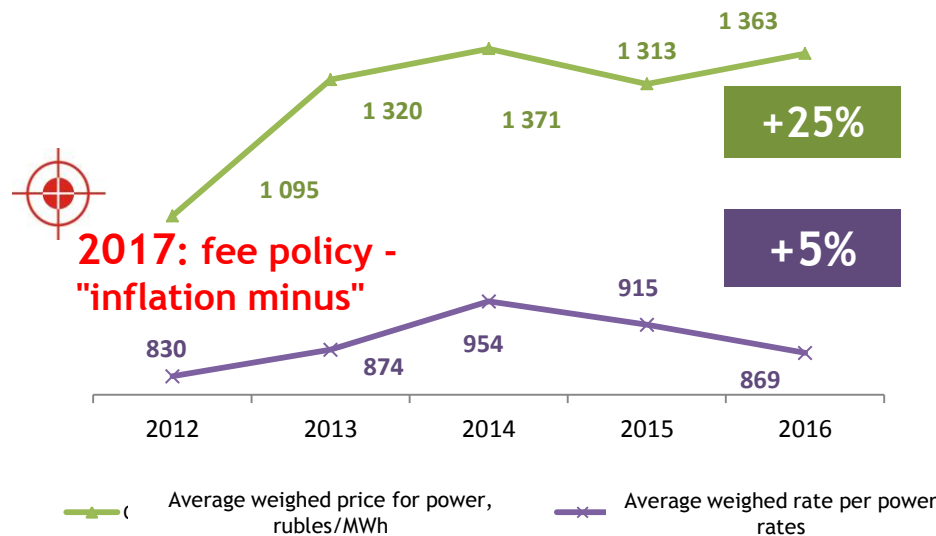
- installed capacity of all power stations in the Russian Federation (as of 01.01.2015) allows generation of up to 1300 kWh per year, additional power increase for 2015-16 prior to output start
- Surplus power value is by 20% (264 bln kWh) higher than current power consumption level in the Russian Federation (1036 bln kWh) and exceeds annual NPP generation.

2010 - 2015 data - Rosstat. 2015–2019 data is provided according to adjusted Social and Economic Development Program of the Russian Federation dated 15.10.2015 and core Social and Economic Development Program of the Russian Federation dated 27.04.2016.

REA Concern's cost dynamics in 2012-2016

(without starting units in industrial operation for less than a year)

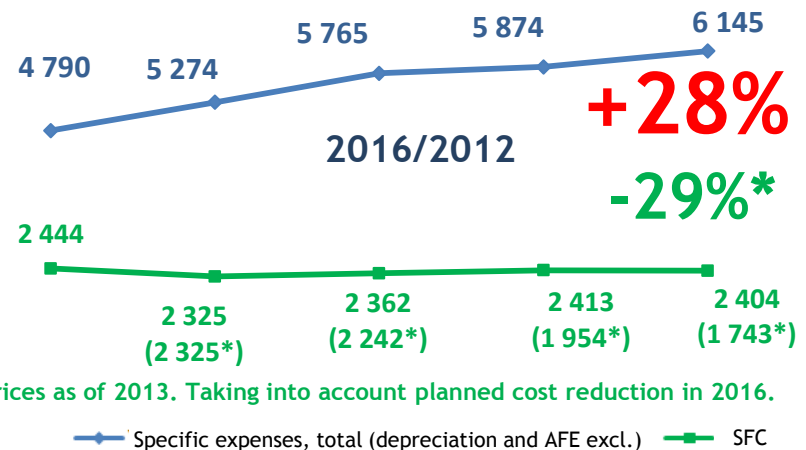
Prices and rates dynamics in comparison with cost growth rate



Inflation influence in Russia:
 industrial products
 producer price index (PPI 2016/2012)

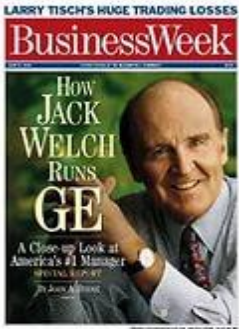
+40%

Specific costs, rubles/kW (for power)



Though inflation-related cost growth rate during 2012-2016 falls behind industrial total inflation level, specific cost growth (without depreciation, AFE, reserve for RW) outruns weighted average rate as per RD by 23%, relative compensation of expenses growth takes place only at the expense of significant optimization efforts and unstable price growth on free market

REA Concern response to macroeconomic "challenges"



"If the rate of change on the outside exceeds the rate of change on the inside, the end is near"

Jack Welch, GE

Income

Free Cash Flow (FCF)
Operational efficiency
Backlog of orders
Revenue



**Improvement
by at least
30-35%
in 2-3 years
(starting from
2014)**



Expense

Specific cost
Administration and
maintenance cost
Cost based investments
Store
Lead time



**Preservation of proprietary investment development resource
against the backdrop of external limits and pressure on costs**



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Key Division activities indicators

		<i>x - at notional value</i> <i>x - in the context of 2015</i>					
Indicator	Average annual FCF 2015-2018 +31% As compared to 2013-2014 level Average annual revenue value 2015-2018 +52% as compared to 2013-2014 level Average annual EBITDA value 2015-2018 +44% as compared to 2013-2014 level	2013	2014	2015	2016	2017*	2018*
1 FCF, bln rubles		109 137	109 126	108 108	101 94	185 163	177 147
2 Revenue, bln rubles		243 303	287 332	324 324	340 317	441 387	507 422
3 EBITDA, bln rubles		104 130	108 125	115 115	107 100	171 150	210 174
4 Investments from Rosatom consolidated investment resource, bln rubles		-	3.2 3.5	0.6 0.6	2.6 2.5	2.4 2.1	2.4 2.0
5 Operational efficiency, million rubles/people		5.1	5.7	6.4	7.0	8.5	9.9
6 Backlog of overseas orders for 20 years, bln US dollars		0.17 0.21	0.46 0.54	0.53 0.53	0.49 0.47	0.62 0.60	0.69 0.65
7 Foreign revenue, bln US dollars		0.01 0.01	0.03 0.03	0.06 0.06	0.07 0.07	0.10 0.10	0.16 0.15

* - data for 2017-2018 approved at the level of validated business plan for 2016-2018 version and does not include risk of Leningrad NPP II unit No.1 commissioning delay.

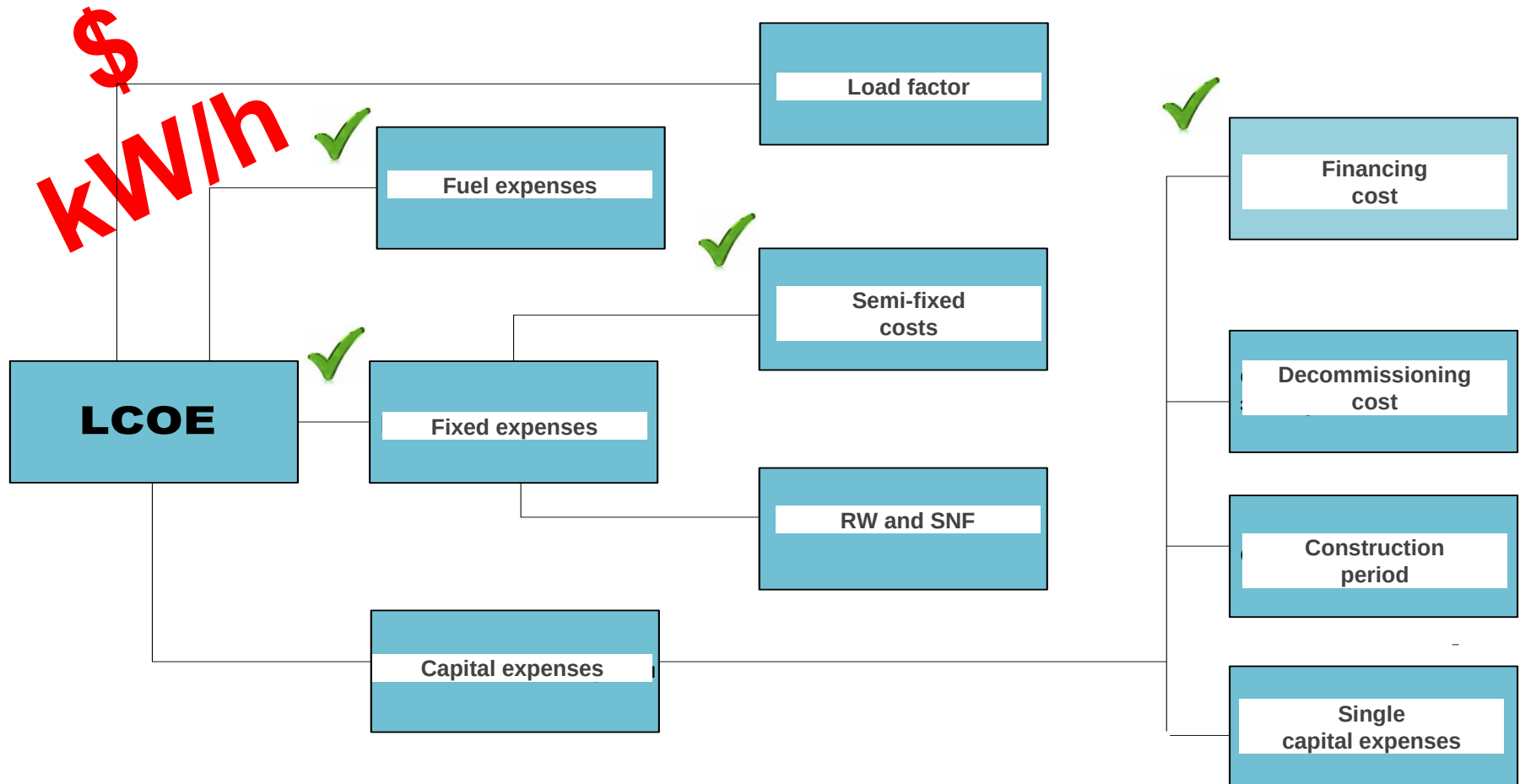


Key Division activities indicators and analysis of meeting strategic goals/tasks by State Corporation "Rosatom" in "Efficiency Enhancement" field

		at price conditions as of 2015 evidence (comparison year)					
Indicator		2013	2014	2015	2016	2017*	2018*
1 Operational efficiency, million rubles/people	+28%	6.4	6.6	6.4	6.5	7.4	8.2
2 Specific semi-fixed cost, rubles/kW (at prices as of 2013) (as per installed capacity)		2,325	2,242	1,954	1,743	1,801	1,764
3 Managing Company expenses for administration and maintenance, mln rubles (at prices of 2013)		2.6	2.4	1.7	1.65	1.7	1.6
4 Inventory turnover, day	-38%	66	61	58	53	47	47
5 Specific capital costs for NPP construction (adjusted) ths rubles/kW, project	-29%	105	101.7	104.8	89.6		
		Novovoronezh NPP II prior to optimization		NPP projects - 2006 (Leningrad NPP II, Novovoronezh NPP II)		Kursk NPP-2 design (VVER-TOI)	

* - data for 2017-2018 approved at the level of validated business plan fro 2016-2018 version and does not include risk of Leningrad NPP II unit No.1 commissioning delay.

LCOE (levelised cost of electricity)



1. Indicator implemented internationally for making strategic decisions on choosing optimal generation type.
2. Indicator characterizes competitive ability of generation type for life-cycle notwithstanding current market model and regulators decisions.

Medium-term business goals of Division

Safety assurance

- Safe operation of existing NPPs
- Realization of decommissioning program for Biblino NPP
- SNF disassembly and removal from NPPs with RMBK reactors
- Preparations for RW removal from NPPs according to acceptance criteria

Expansion of activities range

- Commission of 19 new units by 2030 and service life extension for 11 existing units
- Increase in energy generation from 180 bln kWh in 2014 to 212.4 bln kWh in 2018 and to 298 bln kWh by 2030
- New business areas implementation and development (sales, services abroad, DC, etc.); revenue increase from 34 bln rubles in 2014 to 111 bln rubles in 2018

Competitive ability increase

- LCOE reduction for NPP1 in RF from 2.3 rubles/kWh in 2014 to 2.0 rubles/kWh in 2020 and to 1.65 rubles/kWh in 2030, including:
 - Reaching improvement of VVER-TOI as per project operational costs
 - Reaching specific capital costs with 93 ths rubles per kWh in 2019 (Kursk NPP II) and 75 ths rubles per kWh by 2030
 - Construction period from 60 months in 2014 to 48 months in 2019 and then to 40 months in 2030
 - 93% load factor by 2019
- Realization of "Energy cost management" project:
 - Reduction of specific semi-fixed costs at existing units minimum by 20-22% by 2018, at new NPPs - by 15-20% per MW by 2018 (in comparison with Balakovo NPP)
 - Operational efficiency (generation) increase in 2013-2018 by 5% annually
 - Calculated load factor increase for existing VVER units by 91% in 2019

Globality

- Development of NPP service of Russian design abroad (up to 13 units by 2019)
- Entering the servicing market for foreign design NPPs
- Power trading development abroad



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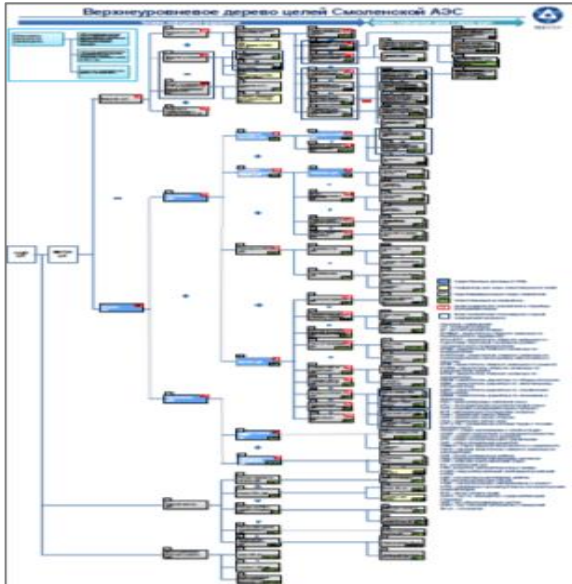
Director General KPI for Rosenergoatom Concern JSC in 2015-2016

KPI name	Evidence 2015	PZ 2016
Electric Power Division FCF, <i>bln rubles</i>	107.7	100.6
Operational capacity (generation based, 2015), <i>million kWh/people</i>	6.59	-
Operational capacity (revenue based, 2016), <i>million kWh/people</i>	6.35	7.0
Rosenergoatom Concern JSC investment program performance index, %	99.75	100
Power generation value at NPP, <i>bln kWh</i>	195.21	196.72
Specific semi-fixed costs (2015, for electric supply), <i>rubles/MWh</i>	329.3	-
Specific semi-fixed costs (2016, for installed capacity), <i>thb rubles/MW</i>	1,955	1,743
Backlog of overseas orders for 20 years (Rusatom Service incl.), <i>bln USD</i>	0.510	-
Integrated index for new products, %	109.2	100
Internal (by tender) and external revenue for new products, <i>bln rubles</i>	57.875	68.5
Backlog of State Corporation orders for new products for 10 years, <i>bln rubles</i>	271.546	272.7
Specific forecasted NPP construction cost estimated with schedule included, <i>rubles/kW</i>	99,758.42	104,778
Efficiency of investment activities integrated index, %	87.2	-
Absence of level 2 incidents as per INES scale followed by occupational exposure of more than 50 mSv per year, units	No incidents	-
Absence of level 2 and higher incidents as per INES, scale units *	No incidents	No incidents
LTIFR, %	0.03	0.15
State tasks performance, %**		100

* In 2016 KPI was changed to «Absence of level 2 and higher infringements, units»

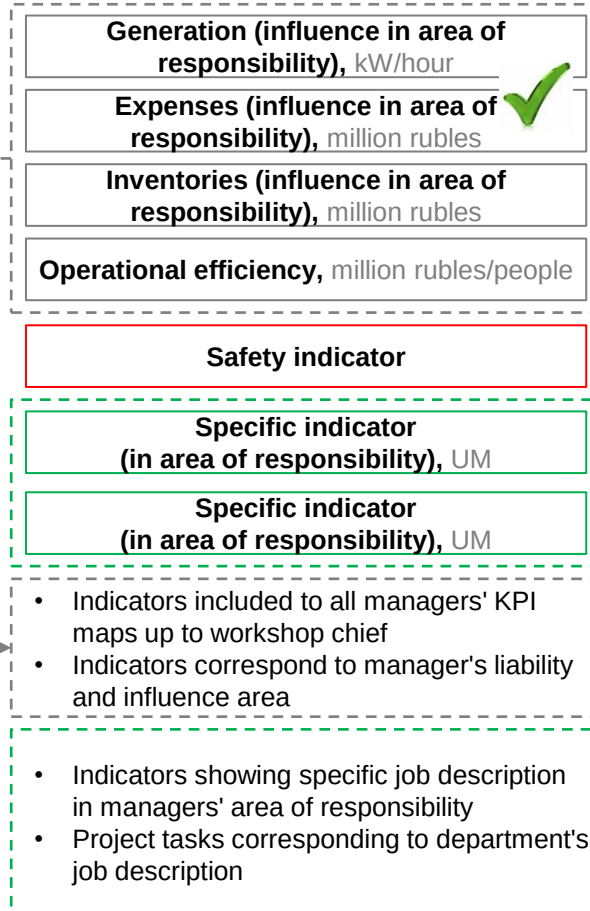
To achieve the specified KPIs, the decomposition of KPIs as the objectives tree and 2016 KPI matrix has been performed

Objectives tree



- Decompose indicators influencing FCF and expenses
- Distribute responsibility for KPIs among managers via indicators explication

KPI maps



X-matrix

- Check KPI correlation for managers and employees (decomposition completeness)
- Update and complement programs and projects aimed at KPI performance
- Specify the most important ones for KPI strategy and projects via weighing coefficients

Transformation of the efficiency and competitive ability oriented corporate culture, 2015-2017

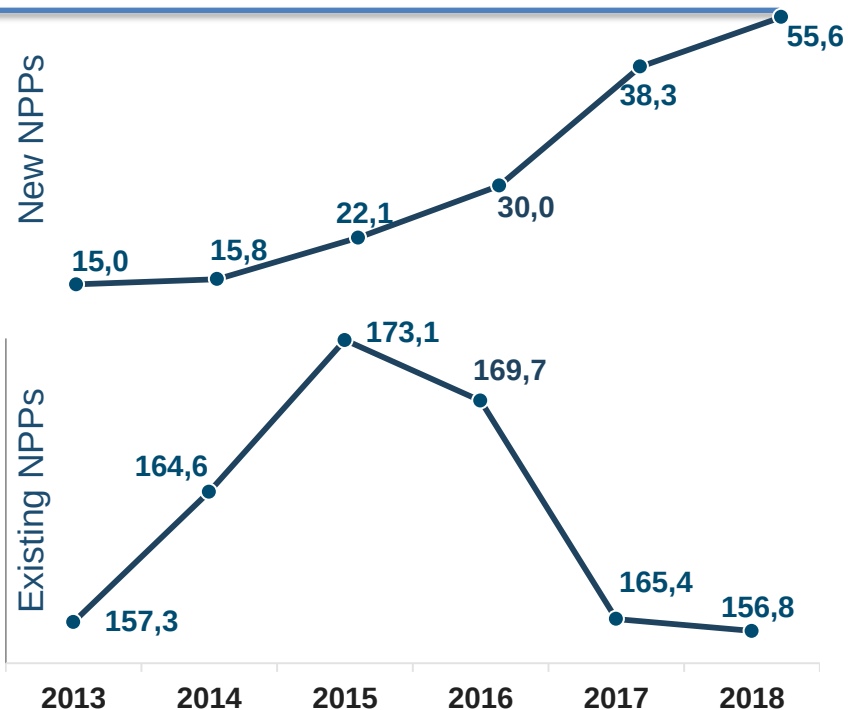
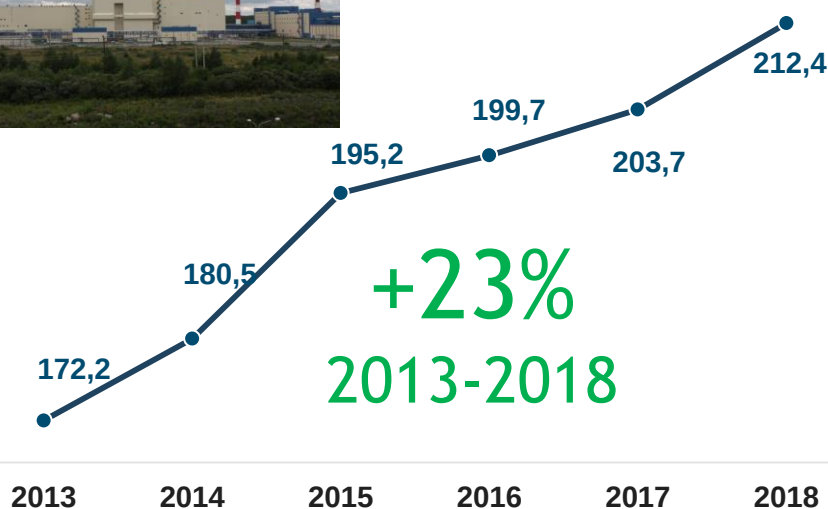
SAFETY Culture + ECONOMY (expedience) Culture

- ✓ Expenses measurement tool and management by exception (variance analysis) at process/order/function/event/operation level (SAP EPR online system unified at all NPPs by 2017 + DS + Infocenter)
- ✓ "NPP+ operation experience" support platform - unique replicate Concern product/process/technology/tool
- ✓ Elaborate motivation system (command indicators, process metrics, project KPIs, strategic KPIs, planning based on goals not "on achieved")
 - Modification of efficiency management paradigm - from prescriptive manner to motivational and cultural, competitive one
- ✓ Problem-solving communication speed, common information space
- ✓ Attention to development and new ideas (think tank, new businesses, organizational modifications for expenses reduction), Rosatom Production System (RPS) platform

Power generation dynamics - MAX task



Power generation, total
bln kWh



Ambitious indicators reached by means of:

- additional repairs with modernization and service life extension;
- cancellation of current repairs at VVER-1000 units: 2017 - 48 days, 2018 - 42 days;
- increase in actual available power via programs for power generation increase.

Negative factors reducing power generation by existing NPPs:

- Dispatcher limitations in several regions
- decommissioning of unit No. 3 at Novovoronezh NPP;
- actual delay of restoration of lifetime performance at RBMK-1000 units

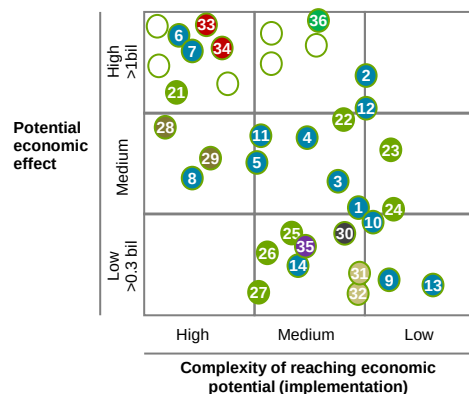
* - data for 2017 corresponds to preliminary balance propositions at FAs of the Russian Federation. Generation for 2018 approved at the level of validated business plan fro 2016-2018 version and does not include risk of Leningrad NPP II unit No.1 commissioning delay.

"35 initiatives" for operational efficiency

- 1 REA Concern developed 35 initiatives implemented stepwise starting from the most important to achieve specified goals



Task prioritization matrix

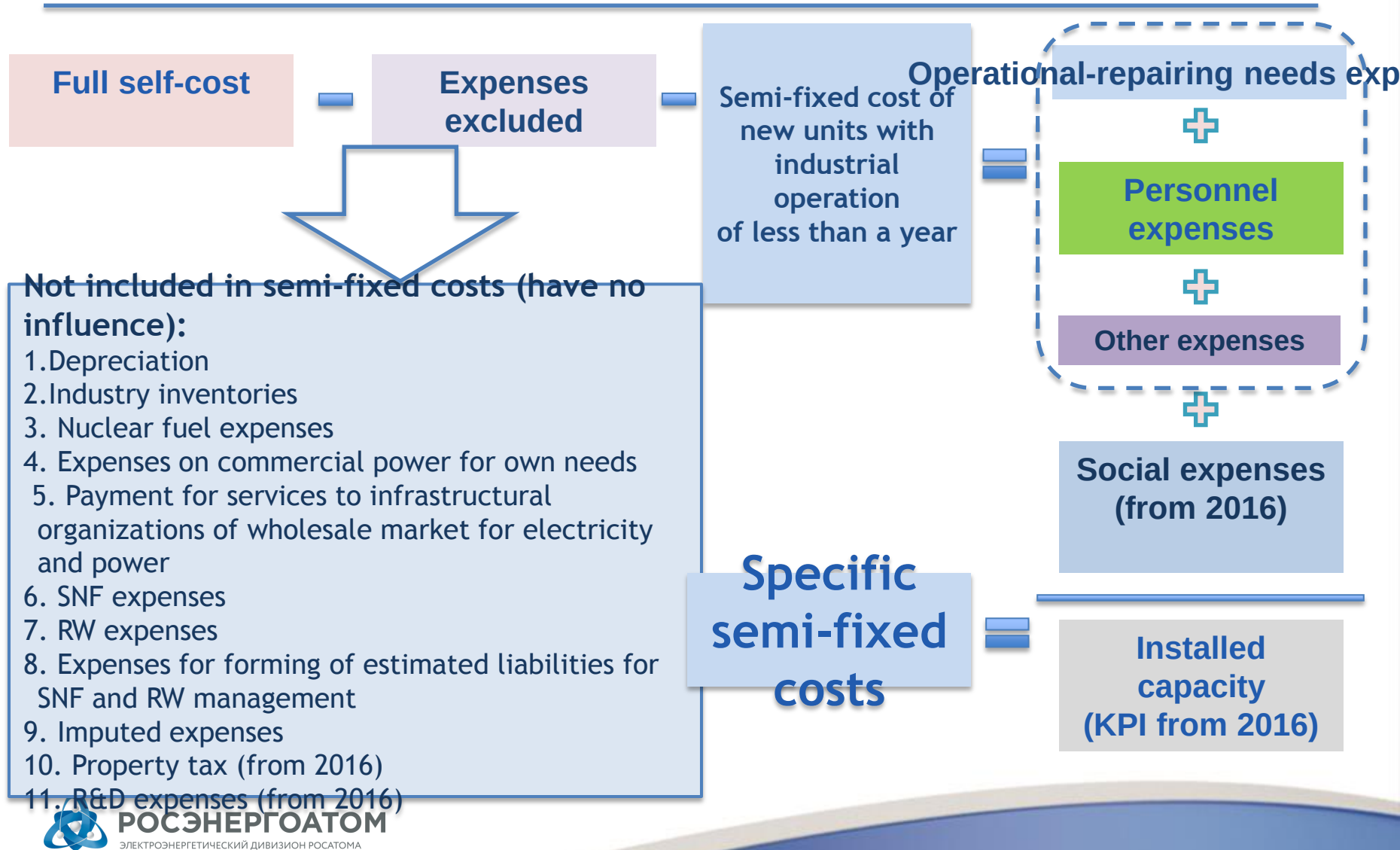


- 2 Program for subsidiaries and associates operational efficiency

Tasks for operational costs reduction and revenue increase of REA Concern		
I. Personnel	- Cut down excessive workshop managing personnel - Cut down shifts number via replacing hazardous work places with normal working conditions - Unite part of workshop personnel functions (e.g. reactor and turbine shops) - Cut down auxiliary works personnel via work processes standartization - Transfer excessive service personnel (e.g. AER) in case repairs efficiency increases - Cut down auxiliary personnel via centralization and best world's practices implementation - Cut down service personnel via repairs scheduling efficiency increase - Cut down operational personnel via best world's practices implementation - Adjust salaries in compliance with region market - Decrease fringe benefits via elimination of harmful factors at work places - Decrease reserve for vacation via cancellation of add. vacation for harmful work environment - Cut down additional insurance payments via cutting down work positions with special harmful work environment - Standardize principles for giving and price of medicinal and prophylactic food vouchers - Outsourcing some of auxiliary functions/positions	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
II. Repair	- Adjusting planned outage period to RD 085-2014 standard - Reduction of planned outage period by 10% as per RD 085-2014 standard - Reduction of planned outage period to best international level - Reduction of shutdown life extension and modernization by 10% - Transfer to 24-month shutdown repairs cycle	✓ ✓ ✓ ✓ ✓
III. Procurements and inventories	- Increase of existing units installed capacity from 104 to 107% - Procurement consolidation among plants to get discounts for amount and procurement directly at manufacturer - Increasing application of long-term/framework contracts and index price determination - Specifications unification for (range of) material assets among NPPs: making procurement decisions basing on total cost of ownership (TCO) - Comprehensive inventories audit, identification of unsaleable goods and their disposal - Requirements unification for structure and amount of inventories of various categories among NPPs - Centralization/unification of (range of) buffer stocks among NPPs - Delivery on time and reduction of buffer stocks	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
IV. Property insurance	- Independent assessment of property and insurance cost to define fair value - Optimization of insured risks and equipment types for separate NPPs	✓ ✓
V. Sales	Development and implementation of detailed standardized scheme for departments cooperation to organize short-term planning and managing regime	✓
VI. Social assets	- Withdrawal of several social assets from NPPs' balance - Expenses reduction for construction of new and modernization of existing assets	✓ ✓
VII. Subsidiaries and associates	Optimization of AER number for repairs, diversification of performed works scope, revenue increase from new scopes	✓
VIII. Property tax	- Operational activities optimization for Energoatominvest LLC - Optimization of property tax payments via tax base reduction and rate optimization	✓ ✓
IX. Support investments	Support investments management, definition of reduction and efficiency goals	✓

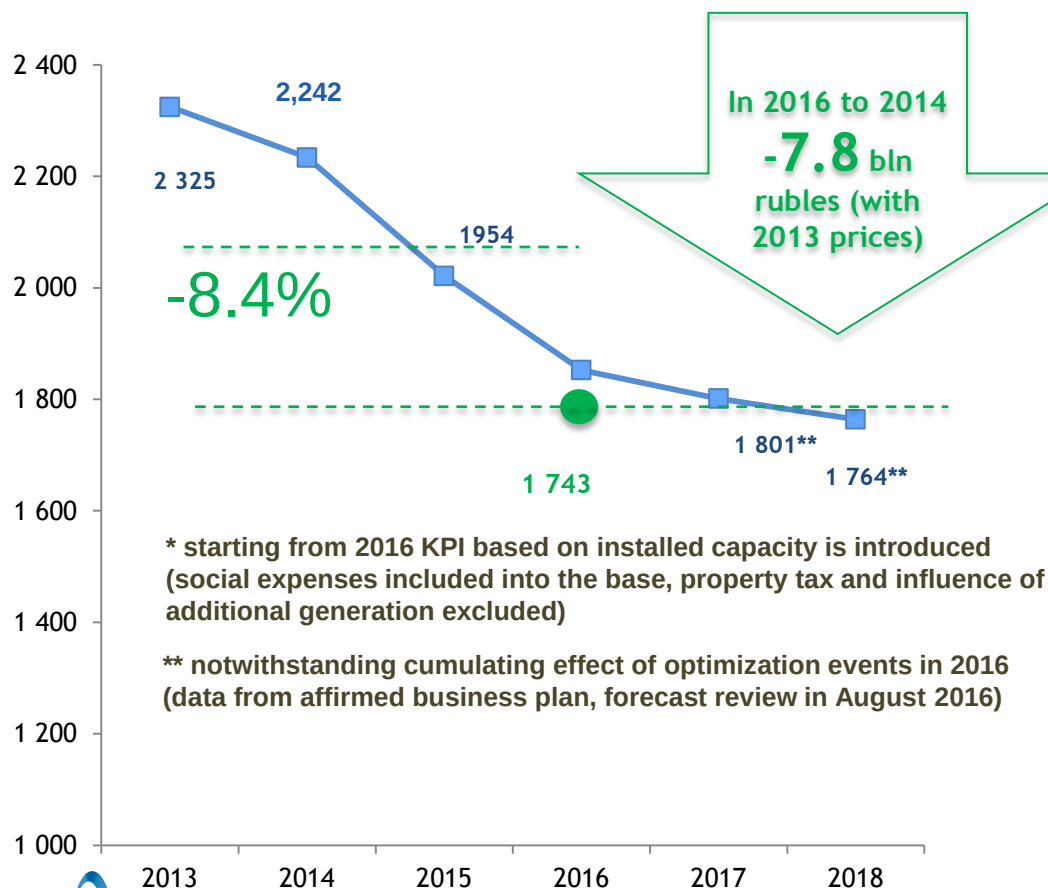
✓ RPS project implementation in 2015

Specific semi-fixed costs calculation method



Accomplishment of State Corporation "Rosatom" task for semi-fixed costs - second revision of business plan for 2016-2018

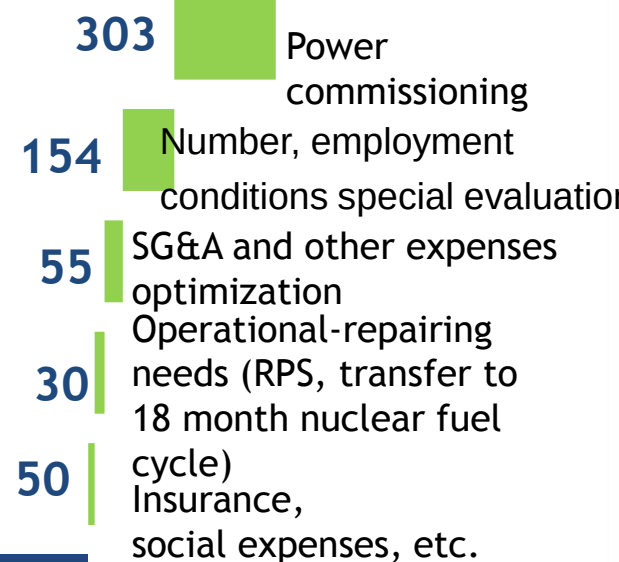
Specific semi-fixed costs for **POWER***,
rubles/kW with prices of base year 2013



Factors of specific semi-fixed costs reduction, rubles/kW

2013

2 325



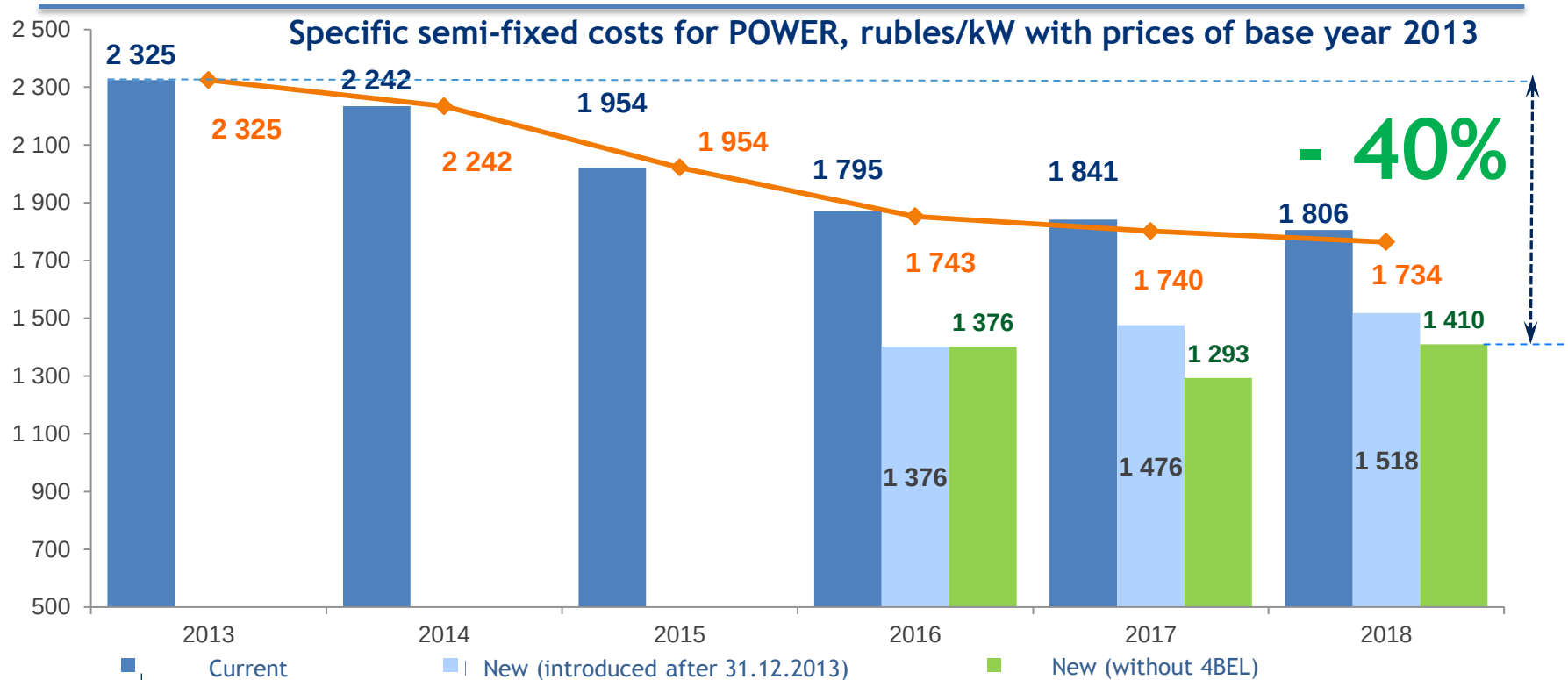
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2016



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Specific semi-fixed costs in the context of existing and new units



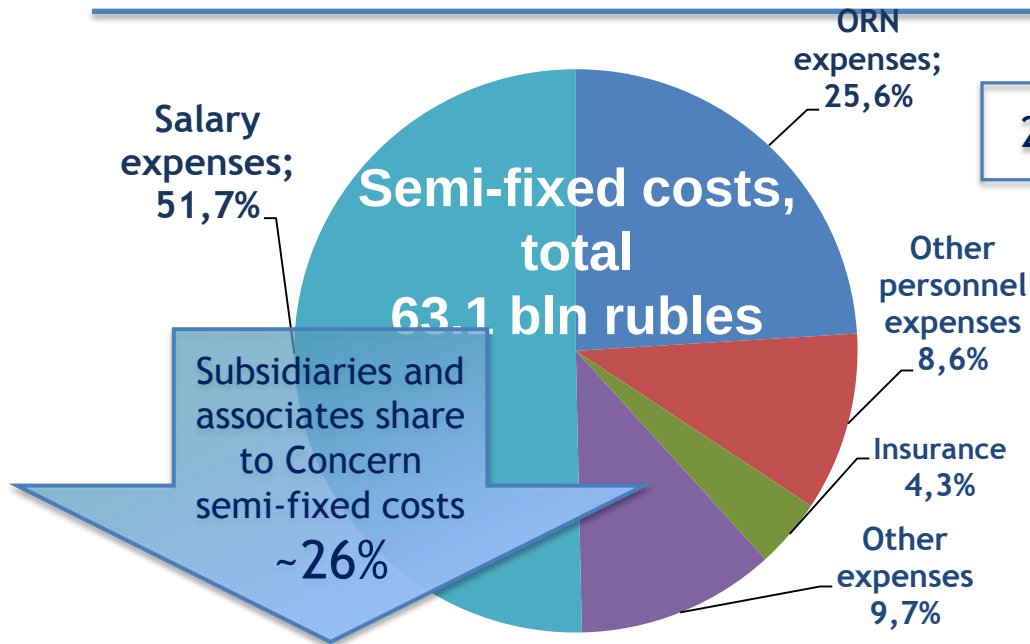
Major factors for reduction of new units specific semi-fixed costs (depreciation and property tax excluded) in relation to existing units:

- normal mode ratio is lower;
- specific expenses for operational-repairing needs are lower (in terms of the business plan forecasts, new units will have no major repairs in repair cycle)



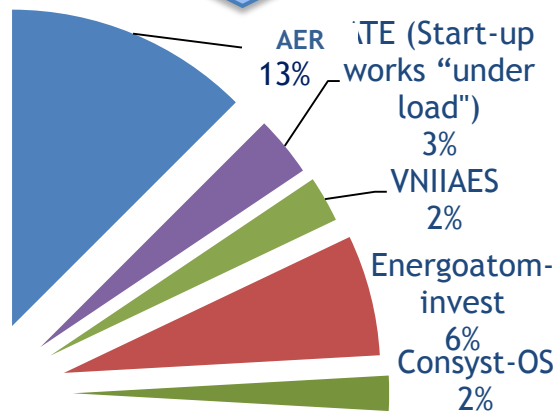
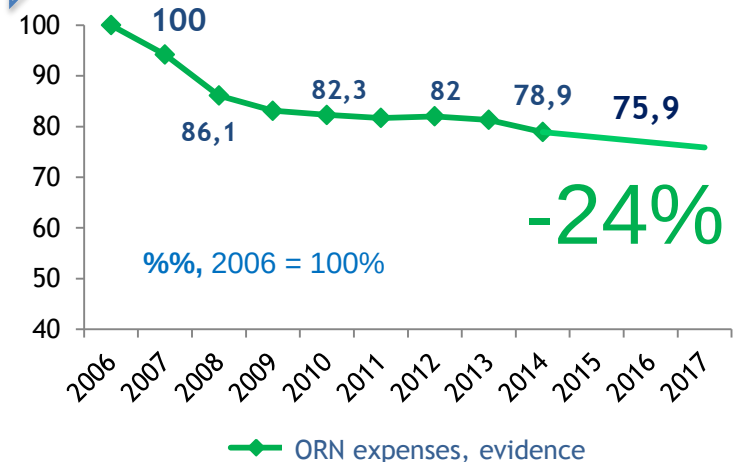
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TOP-5 of REA Concern specific semi-fixed costs



Specific costs on operational-repairing needs dynamics

Limitation: expenses reduction and operation safety balance (Decree of the Government of the Russian Federation No. 705 dd. 20.09.2008)



Effects of program for subsidiaries and associates operational efficiency ~ 2 bln rubles in 3 years (2016-2018) with necessary additional expenses of approximately 600 million rubles

Effect of additional optimization program for 2016 – 2.2 bln rubles (over approved by BD budget) + inventories optimization program

Obligatory command KPI 2016 for business unit (branch, subsidiary or associate) – EXPENSES (budget/limit – lower level for KPI performance, motivation for add. projects and RPS – NPPs rating, "RPS leader", "Function expenses" KPI)

New products. Chosen growth points support strategic goals of Division and State Corporation "Rosatom" and are synergetic with power generation

Growth points for "New businesses"

	Strategic tasks	Major development directions
1 NPP service abroad	Entrance to adjacent markets and foreign market of NPPs of non-Russian design	Full service for Russian NPPs abroad
2 Power sales	Prices for power hedging and provision of negotiation position with regulatory body	Development of power sales in Russia and start for sales abroad as soon as Baltic NPP develops
3 Long-term projects for generation	Generation growth by means of more profitable projects	Improvement of Baltic, Far East NPPs, construction of floating NPP
4 Other projects	Business development that supplements existing resources and powers	Projects: DPC, additional products (B2B, B2C), isotopic products

Matrix of goals correspondence

Strategic Goals	Safety assurance	Expansion of activities scale	Increasing of competitive ability	Globality
Performance of state tasks		2 3	2	
Contribution to the development of economics of Russian Federation	1	2	1 3 4	1 3
Economic performance improvement in Russia and on global market	4	3	2 3	1 2 3

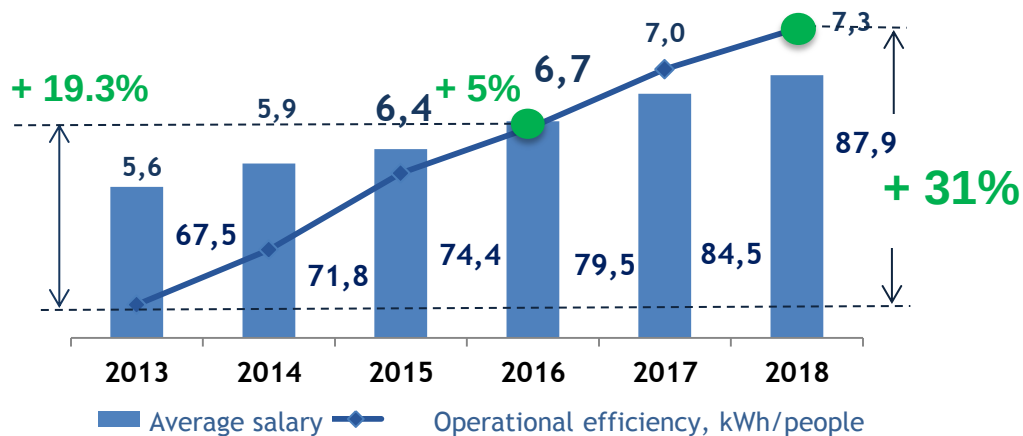


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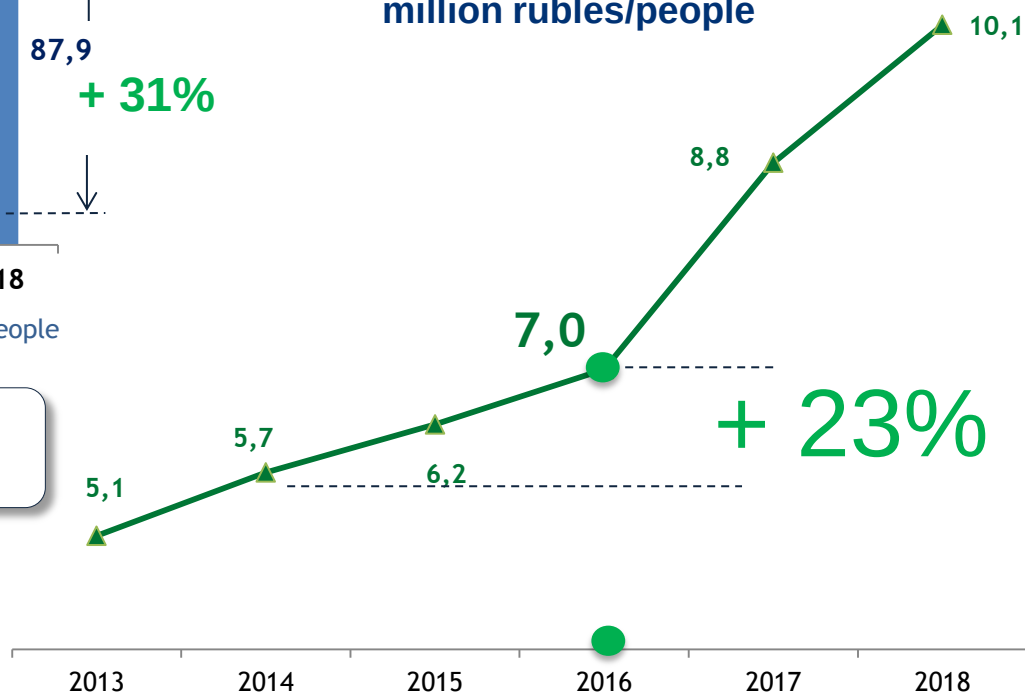
Operational efficiency in monetary terms

Operational efficiency, million kW/people
(generating number, forecast)



TARGET 2016/2017 more than 7 million kWh/people

Operational efficiency
(for entire Division)
million rubles/people



Optimization tasks for 2016 (optimization solutions and tools)

1

- Performance of operational expenses for 2016 limit taking into account reasonable level of safety assurance
- Expenses growth control by means of industrial reserves
- Corporate functions centralization with liquidation of excessive material balance inventory transactions, document management and reporting
- Implementation of "economy culture", "intolerance-to-losses culture" (RPS-enterprise, RPS in offices, prudent manufacture)
- Rational investment resource application, constant project prioritization and financing sources rebalancing

2

- Development of risk management system (significance level, identification procedure, remedial measures management) + information system
- Planning accuracy (finance planning)
- Well-knit motivation system (objectives tree, top down approach for KPIs)
- Operation activities automation (ERP resources management, unified expenses analytics, specific benchmarks, operation knowledge and experience management, maintenance, equipment, and repairs management) basing on M&R solution of the Division
- Construction projects management automation (deadlines/schedules, events/retrofitting programs, estimation/cost)



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Round table. Section Economics

Finance and Economics Division business card

Economics and Controlling Department

- administration of business planning, budgeting and budget implementation forecasting;
- planning and forecasting for A&M budget estimate implementation;
- expenses management and generating summary management statements;
- drafting and harmonizing economic KPI passports and KPI statements;
- SEDP drafting;
- calculation of financing sources for Concern IPs, drafting offers for net profit allotment.

Accounting

- maintenance of accounting and tax records for Concern's financial and economic activities;
- drafting Concern's statements and submitting them to tax bodies and superior organizations;
- accounting fixed and current assets of Concern;
- representing Concern in tax bodies, non-budgetary foundations and government statistics agencies.

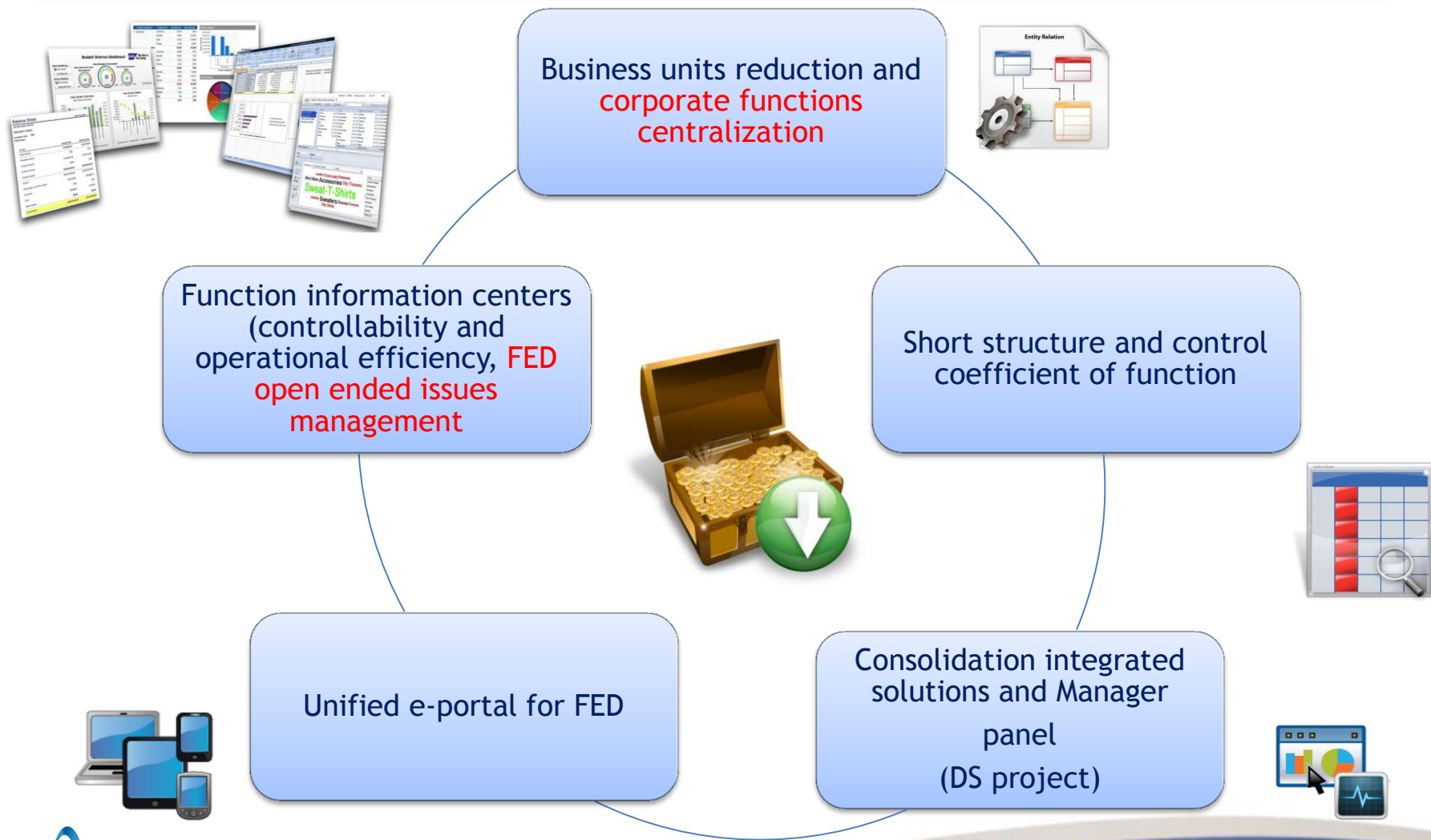
Treasury

- participation in business planning, budgeting and budget implementation forecasting;
- balancing of cash flows, liquidity and current assets management;
- treasury transaction performance, identification of financing schemes for reorganization, merger and acquisition projects;
- finance and credit risks management;
- development of insurance coverage policy and its implementation.

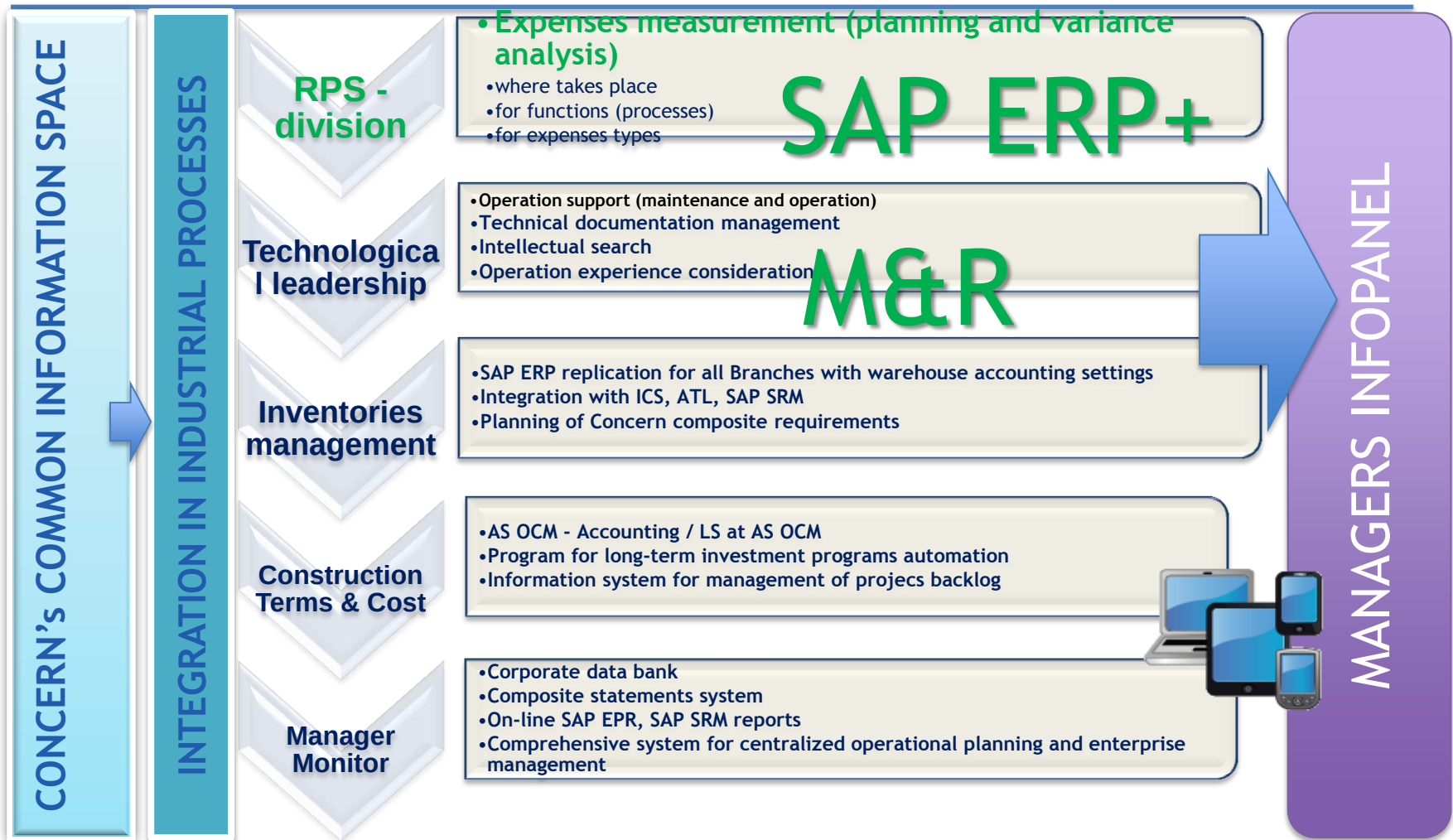
Information Technologies Department

- creation of a common information space for the Concern at all NPP life-cycle phases;
- implementation and support of specialized IT solutions for finance and economic activities;
- development and provision of reliable performance for Concern ICT landscape.

Finance and Economics Division optimization directions for 2016



IT tasks for 2016



REA Concern expenses management basing on SAP ERP

Upon events schedule

Activities of
ROSENERGOATOM

Current regular

PROGRAM

Program section

Subsection 1

Subsection 2

Branch

Action

- Composite investment program
- Nuclear, Radiation, Technology and Fire Protection
- NPP Decommissioning Program
- **RFZ** Program
- Program for RW handling

Program structure

new

Expenses scope:

- investments, R&D, licensing
- industry inventories
- long-term prepaid expenses
- financial commitments
- other expenses, %, currency differences distributed for project/program cost of production

Standard hierarchy of cost centers

Branch (NPP)

Workshop/Department

Cost center

unification

Expenses scope:

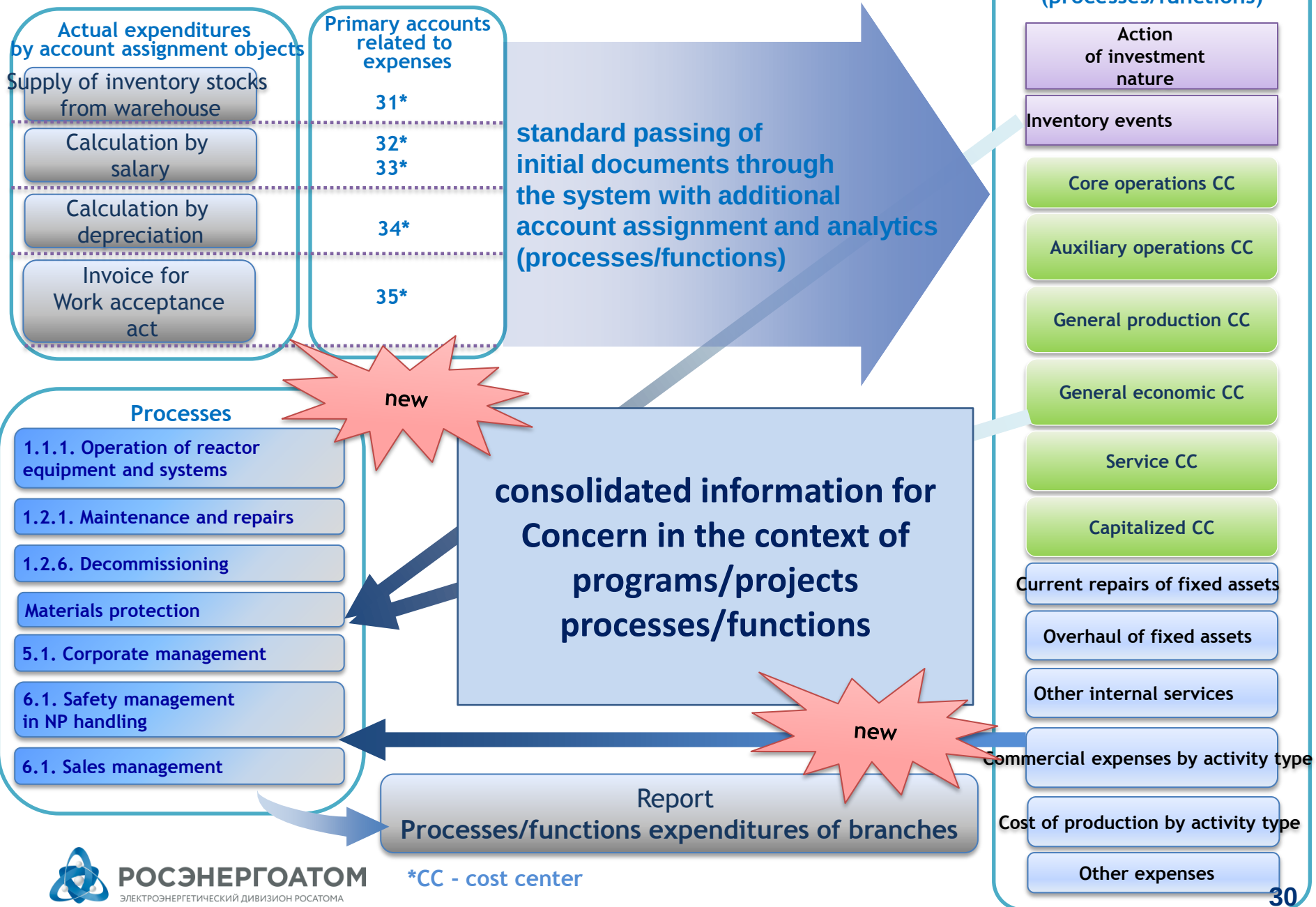
- Core operations
- Auxiliary operations
- General production
- General economic
- Service
- Capitalized for distribution

unification

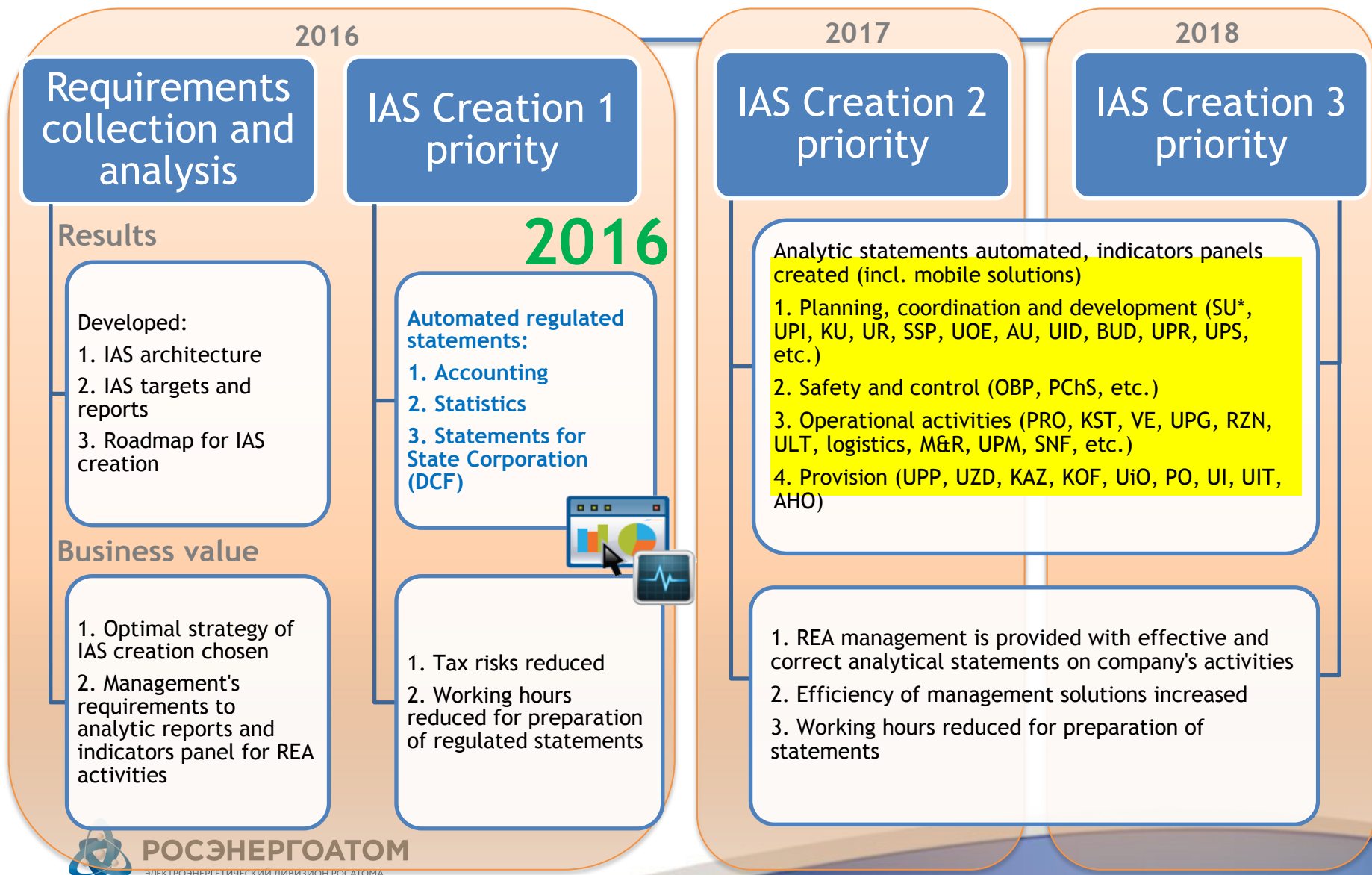
Internal events for current activities

Expenses scope: Current repairs of fixed assets, overhaul of fixed assets, other internal services, transportation expenses, other expenses, administrative expenses by activities, commercial expenses by activities, cost of production by activities, cost transfer to branches (intercompany expenses).

Expenses analysis by processes and functions



Development of information analytical system for Concern (IAS / DS)





Distribution and specification of **responsibility** and **powers**



Analytic property, financial **results and expenses** (budget estimate)
ringfencing



Efficiency of business performance for **remote** sites



Decrease in staff **number** at central office, existing NPPs (general economic personnel exclusion from calculation of generating number and operational efficiency)

Scoring criteria matrix

Ringfencing goals/tasks	preservation of branch status	separate balance	indexes in analytical accounting	presence of unconventional corporate and service processes
Responsibilities and powers	✓	✗	✓	✗
Analytics	✗	✗	✓	✓?
Remoteness	✓	✓?	✓	✗
Number	✗	✗	✓?	✗

"Problems management"
effectively and informatively

FED e-portal and mobile access

Control of key events, monitoring, open ended issues management

Thank you for your attention!



РОСЭНЕРГОАТОМ
ЭЛЕКТРОЭНЕРГЕТИЧЕСКИЙ ДИВИЗИОН РОСАТОМА