Skolkovo

ENERGY EFFICIENCY IN RUSSIA: NEW OPPORTUNITIES

AS OF DECEMBER, 2011

ABOUT THIS DOCUMENT

- The goal of this document is to describe significant changes which took place in energy efficiency space in Russia as well as current trends in Russian society and State policies aimed to increase sustainable use of energy resources. Moreover its purpose is to outline new investment opportunities in dynamically growing energy efficiency market place
- Document is targeting mostly foreign investors and leaders of global energy efficiency market who posses this unique opportunity to enter a new territory with large potential for investments into energy saving technologies and equipment
- Here we outline various direction for improvement of energy efficiency in Russian economy and give high level assessment of market potential. The focus of this document is on priority areas assessed based on the size of potential, the existing infrastructure and readiness of normative base for stimulating investments:

  - Energy savings in buildings

  - Decreasing losses of heat and energy

  - Improvement of energy efficiency of heat and electricity generation

- Moreover this document describes the results of recent reforms in Russian regulation to increase and stimulate energy efficiency and existing programs of various institutions and organizations aimed at supporting project in energy efficiency space.

EXECUTIVE SUMMARY

- Lengthy economic decline in the 1990s and insufficient investment in the early 2000s led to a deficit of investments in infrastructure and the energy industry. In recent years Russia has stepped up its investments, including investments in energy efficiency projects, but despite the robust growth, increase in investments and demographic recovery of recent years there is still a significant gap in energy efficiency between the Russian economy and those of major countries, which hampers Russia's competitiveness
- In 2008 energy efficiency was proclaimed a priority for the modernization of the Russian economy. Public policy in the area of energy savings is aimed at attracting investment and foreign experience into the sector. The state has taken a range of systemic measures to develop this sector
  - In 2009, the main law 261-FZ was enacted, creating a foundation for energy efficiency in Russia. Over 50 regulations were approved in record time to create a firm basis for the development of energy efficiency businesses (transition to meter-based payment for energy consumption, obligatory energy audits for public and regulated bodies, regional energy saving programs, creation of an energy services market, requirement with respect to energy efficiency class labeling and many other measures)
  - Under the State Energy Efficiency Program, approved in December 2010, RUB 5.2 bn per year were made available to co-finance regional energy efficiency projects, other supporting measures were enacted, the Russian Energy Agency was created
  - The Presidential Commission for Modernization ran pilot projects in 14 regions and 25 municipalities and published generic technical and organizational solutions; legislative barriers to developing energy savings in housing, public sector bodies, small-scale energy production and utilities infrastructure were removed
  - Development institutes have focused on energy efficiency. The Skolkovo innovation center has created an Energy Efficiency Cluster (over 120 projects related to energy savings), RUSNANO has invested over SD 1.5bn, banks such as Gazprombank, Vnesheconombank, VTB group banks have started offering specialized lending products for energy efficiency and created energy services subsidiaries
- The market niche for energy efficient technologies in Russia is only just taking shape. The investment potential of identified projects with a payback period of under 5 years exceeds USD 30bn. Most attractive areas for investors include improvement of energy efficiency of buildings and heating systems, new energy efficient consuming equipment installations and distributed power generation projects. Right now global leaders in energy efficiency have a unique opportunity to discover a new growing market with enormous potential

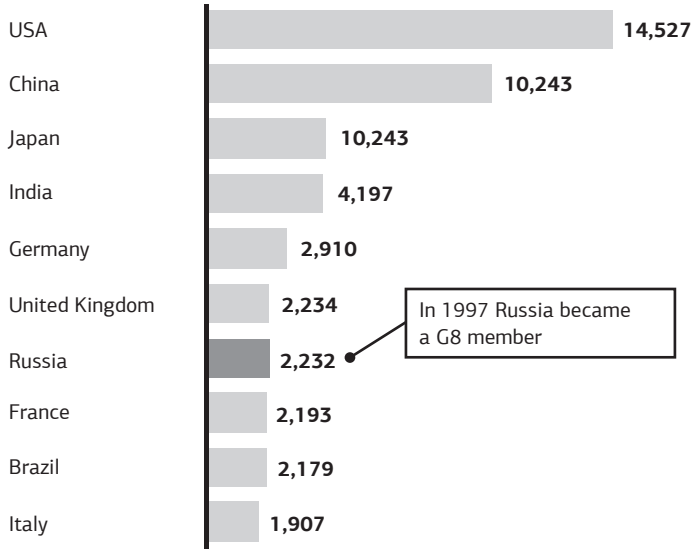
ENERGY EFFICIENCY IN RUSSIA: NEW OPPORTUNITIES

RUSSIA IS A RAPIDLY DEVELOPING COUNTRY WITH 7TH LARGEST ECONOMYIN THE WORLD

Russia is seventh in the world for GDP volume and growth remains rapid. Thus, between 2000 and 2010 average GDP growth amounted to 4.8% in real terms and to 5.2% by purchasing power parity. Thus, the Russian economy is attractive for investment due to a balanced combination of high growth rates and average per capita incomes that are sufficient to sustain one of the largest consumer markets in Europe

Russia is the 7th largest economy in the world

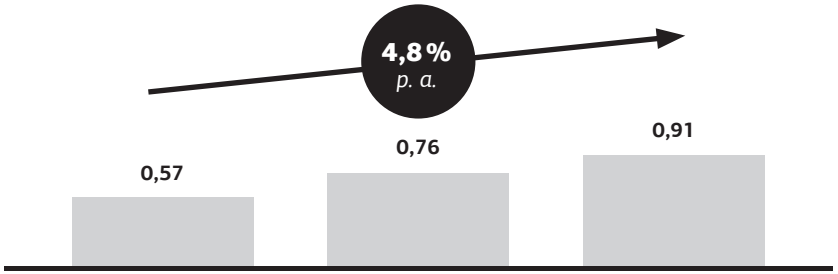
GDP by purchasing power parity
USD bn, 2010



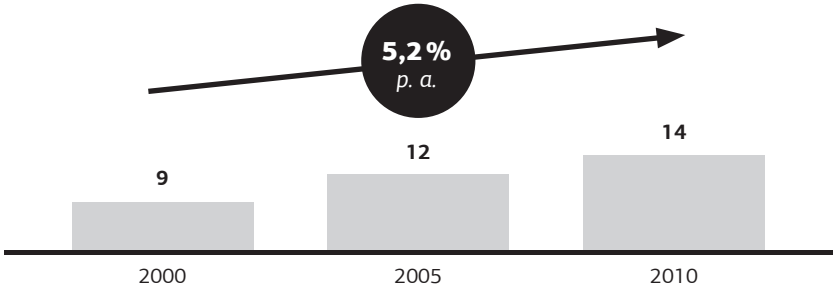
[1] *In 2005 prices*

Robust GDP growth: annual growth of about 5% since 2000

GDP in real terms1
USD bn



GDP by purchasing power parity per capita[1]
USD '000 per capita

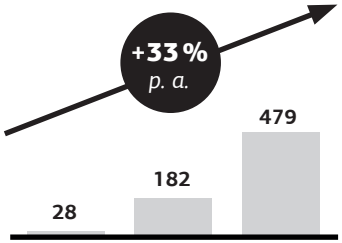


SOURCE: EIU; Global Insight

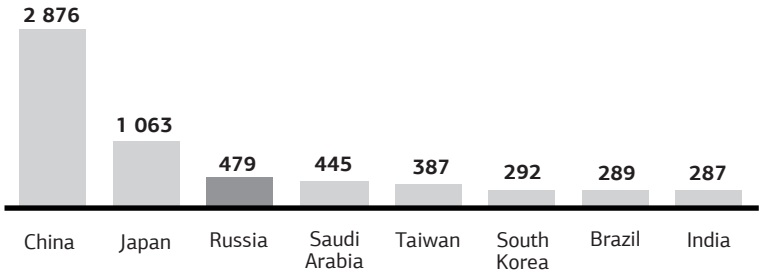
RUSSIA HAS GAINED SIGNIFICANT FINANCIAL STRENGTH SINCE 2000

Russia has accumulated significant international reserves (3rd in the world)

International reserves
USD bn

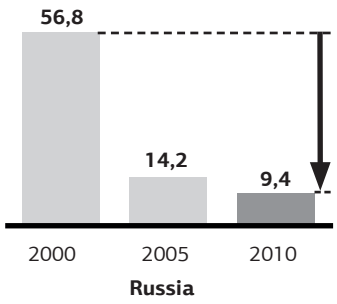


International reserves
USD bn, 2010

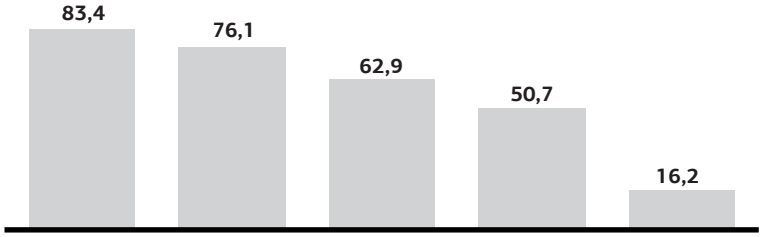


Public debt as percentage of GDP fell to 9,4% in 2010, which is among the lowest in the world

Public debt
GDP percentage

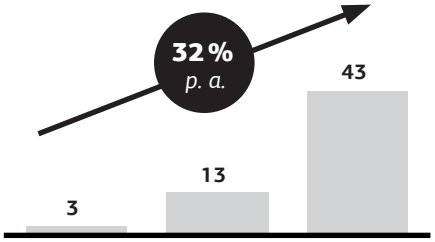


Public debt
GDP percentage, 2010



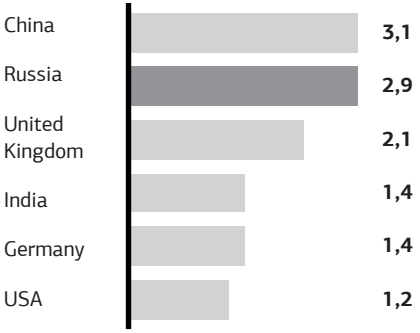
Foreign direct investment (FDI) has seen stable growth

FDI volumes in Russia
USD bn



FDI accounts for a larger percentage of GDP than is the case for most large economies

FDI in different countries
GDP percentage, 2010

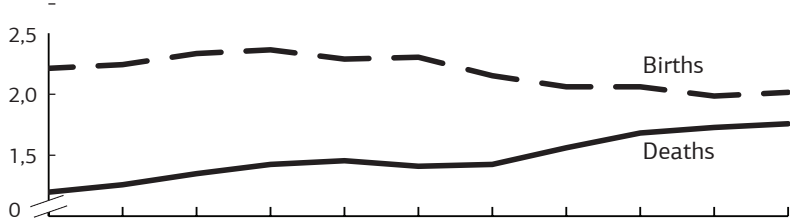


SOURCE: Central Bank of Russia; EIU; CIA World Factbook

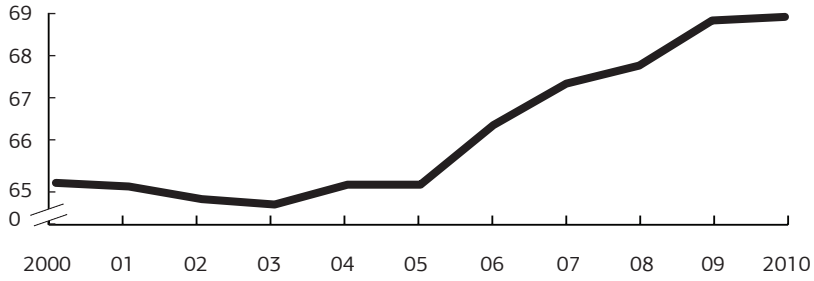
THE SOCIO-ECONOMIC ENVIRONMENT IN RUSSIA IS IMPROVING

The demographic situation in Russia is improving

Birth rate and mortality in Russia
Millions people per annum



Life expectancy[1]
Eears

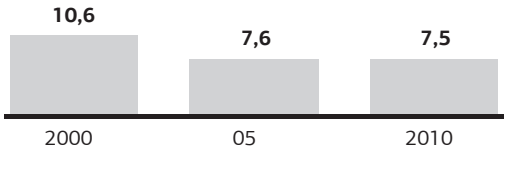


Income levels are rising

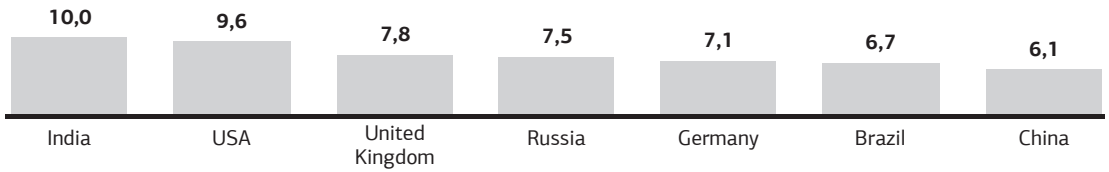
Per capita income
RUB '000 per month, 2010 prices

Unemployment is among the lowest in major countries and is decreasing

Unemployment in Russia
Percent, 2000–2010



Unemployment in major countries
Percent, 2010



[1] *Average life expectancy at birth*

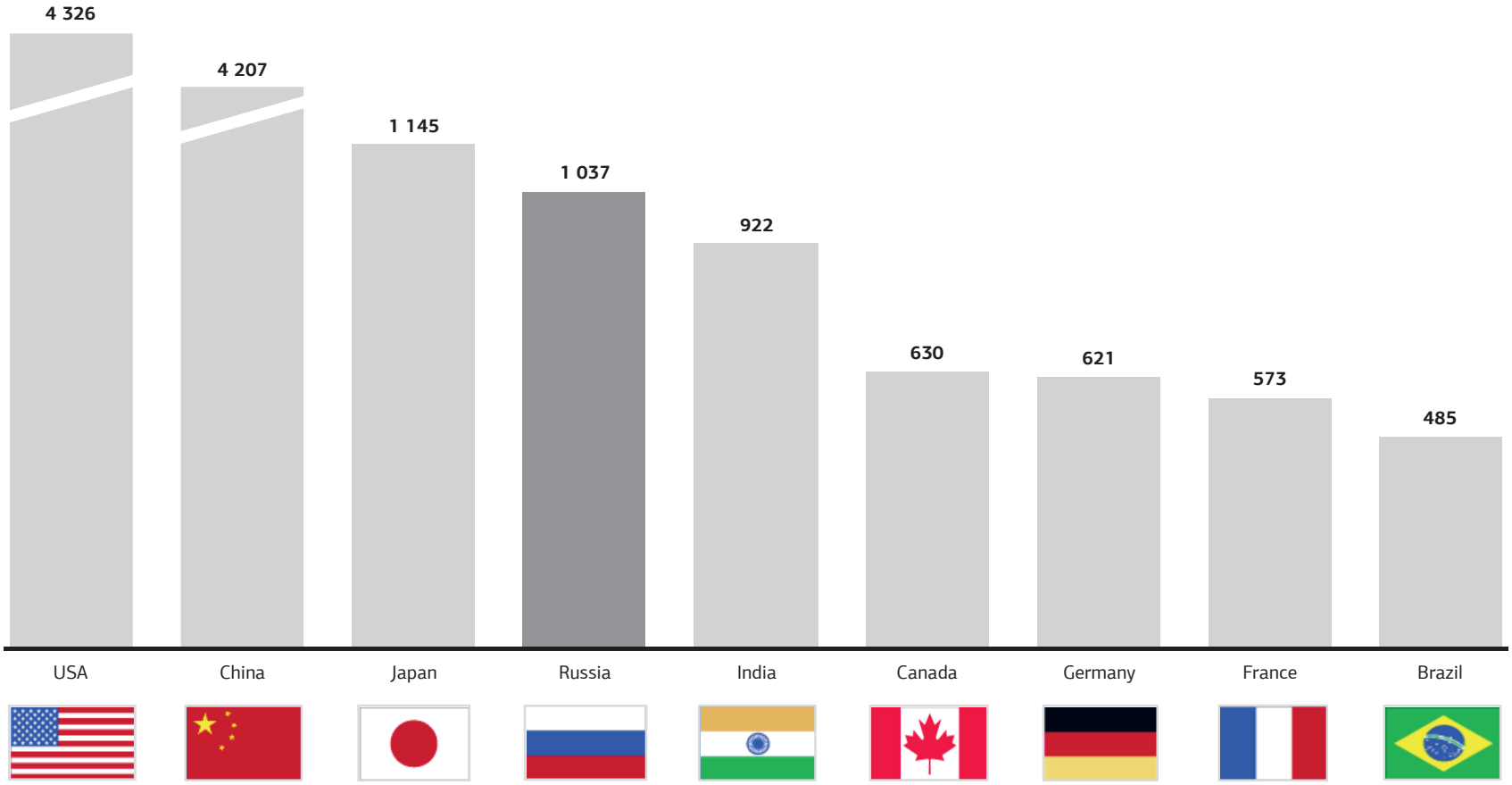
SOURCE: Federal State Statistics Service (Russia) ; Ministry of Health and Social Development of Russia

ENERGY EFFICIENCY IN RUSSIA: NEW OPPORTUNITIES

RUSSIA IS AMONG WORLD'S BIGGEST POWER MARKETS

Total electric power generation

TWh, 2010

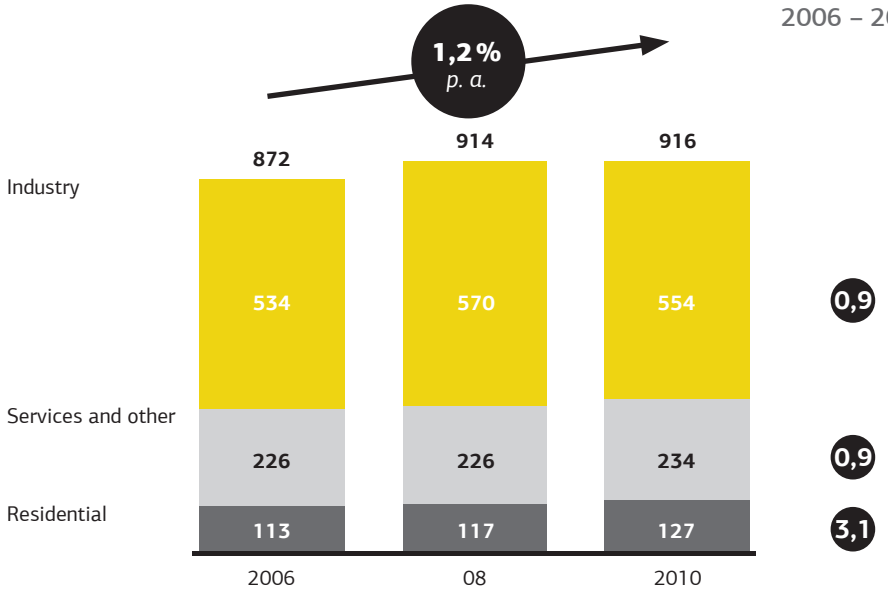


SOURCE: BP Statistical Review of World Energy, June 2011

THE STRUCTURE OF POWER CONSUMPTION AND INDUSTRIAL STRUCTURE MAKE ISSUES OF ENERGY EFFICIENCY INCREASINGLY RELEVANT IN RUSSIA

Electric power consumption structure

TWh



CAGR

Percent,
2006 – 2010

Share of energy intensive[1] industry

Percent

In GDP	42	39	39
In exports	86	87	93

- Most of the power consumption in Russia is accounted for by industry (around 60% of consumption)
- The Russian economy is highly dependent on energy intensive sectors, since the share of energy intensive industry in GDP is around 40%, and energy intensive sectors account for over 90% of exports
- This is the reason why energy efficiency was chosen as a key area of modernization of the Russian economy

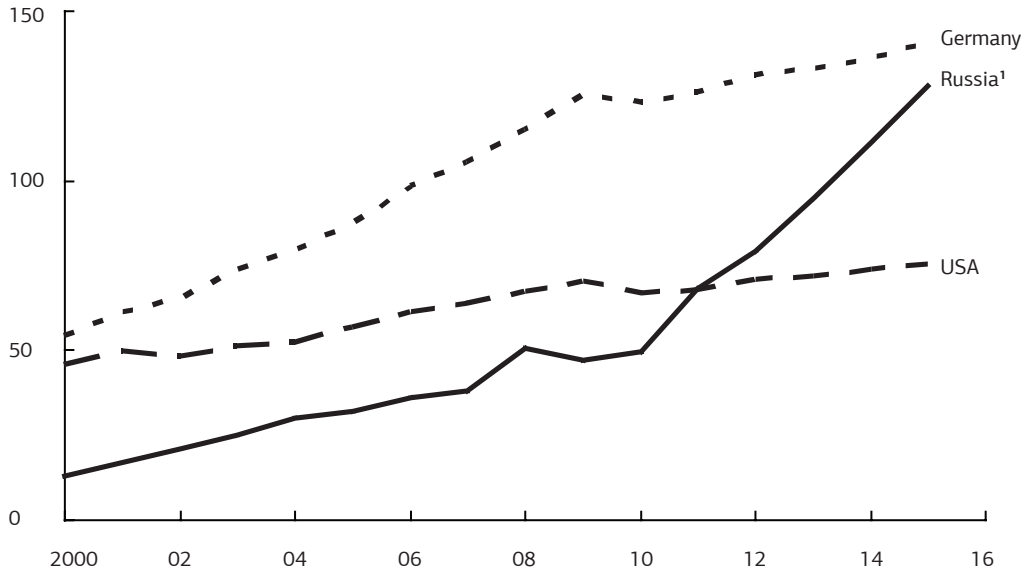
[1] *Extraction and heavy industries*

SOURCE: Federal State Statistics Service (Russia)

POWER IS NOT CHEAP ANY MORE: INDUSTRIAL CONSUMER PRICES EXAMPLE

Average price of power for industrial consumers

USD/MWh (nominal prices)



¹ *Tariffs through 2011 are based on data from the Federal State Statistics Service; tariff forecasts are according to the Ministry of Economic Development*
² *Assuming real growth of power prices by 50% between 2011 and 2020, 6.2% inflation and a decrease in the RUB/USD exchange rate from 28.8 to 26.9*
³ *Foreign tariff forecasts are according to Enerdata in the Recovery scenario*

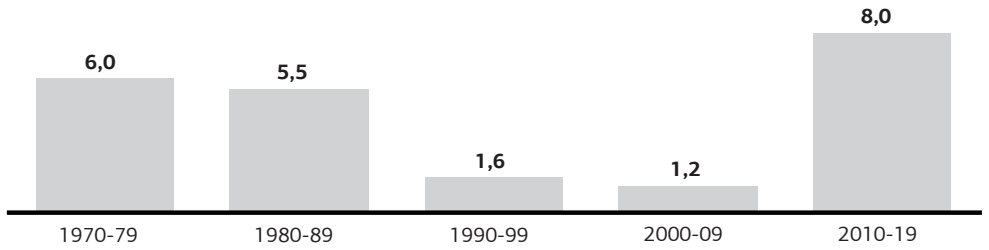
The myth of cheap Russian power is no more. In 2011 the price of power for industrial consumers reached parity with that in the USA. According to forecasts by the Russian Ministry of Economic Development2, already in 2015 the price of power for Russian industrial consumers can be over 1.5 times as high as in the USA3 and just 10% below the corresponding price in Germany

SOURCE: Federal State Statistics Service (Russia), Enerdata, Ministry of Economic Development of Russia, EIU

TO ENSURE ECONOMIC GROWTH, RUSSIA MUST BUILD NEW GENERATION FACILITIES AT A MUCH HIGHER PACE THAN IN THE LAST 20 YEARS

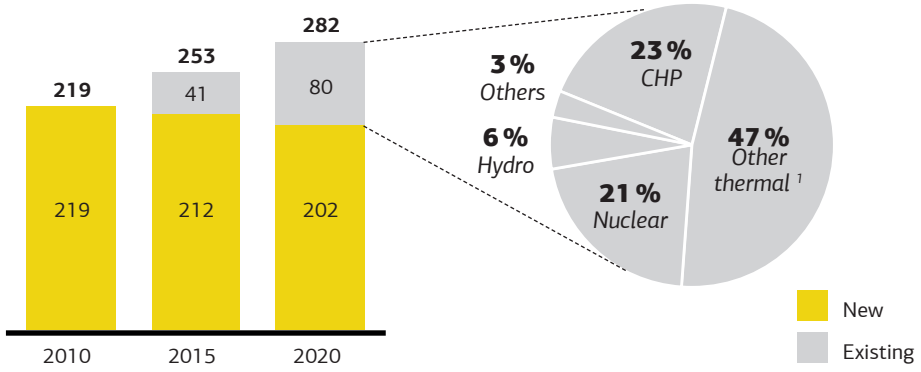
New generation capacity

GW per year



Demand for generation capacity in Russia till 2020

GW



- In the past 20 years Russia has not invested enough into building new generation
- In the next ten years, Russia has to expand its generation capacity substantially (by more than a third of the capacity available today)
- A substantial portion of this capacity will be accounted for by gas and coal generation, which will create new possibilities for manufacturers of energy efficient equipment

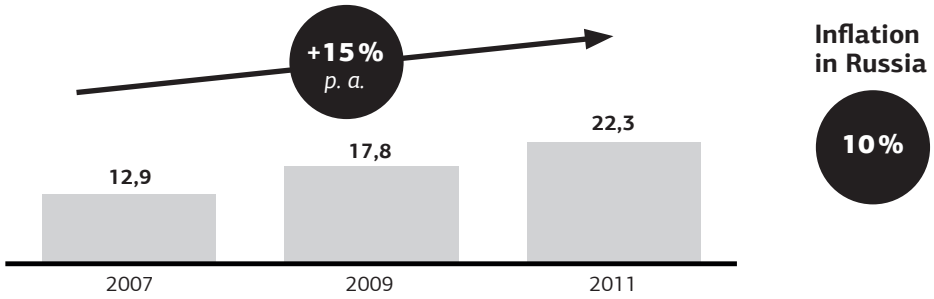
[1] *Not committed and not described in mandatory investment program during Power Sector reform in Russia in 2005-06*

SOURCE: Ministry of Energy General Scheme of Power Generation Development in Russia till 2020

THE GROWTH OF HEAT TARIFFS IS FAR AHEAD OF INFLATION

Average residential heat tariff in Russia

RUB/m2 per month (nominal prices)



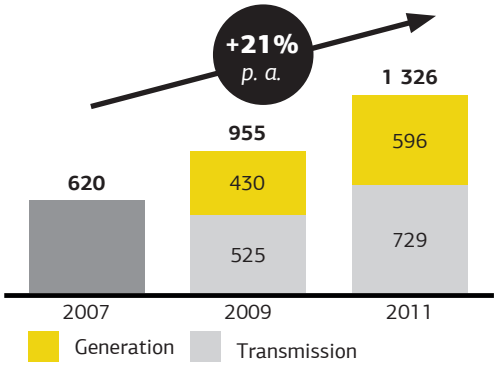
Inflation in Russia

10%

Residential heat tariff

RUB/Gcal (nominal prices)

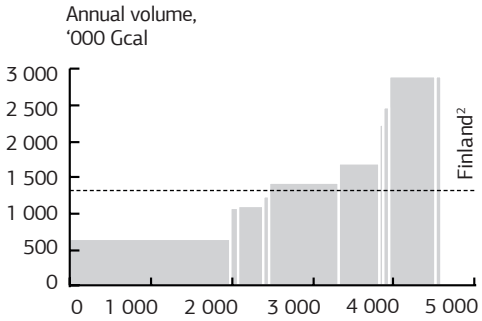
MOSCOW EXAMPLE



Industrial heat tariff[1]

(2010) Tariff RUB/Gcal

THE AMUR REGION EXAMPLE



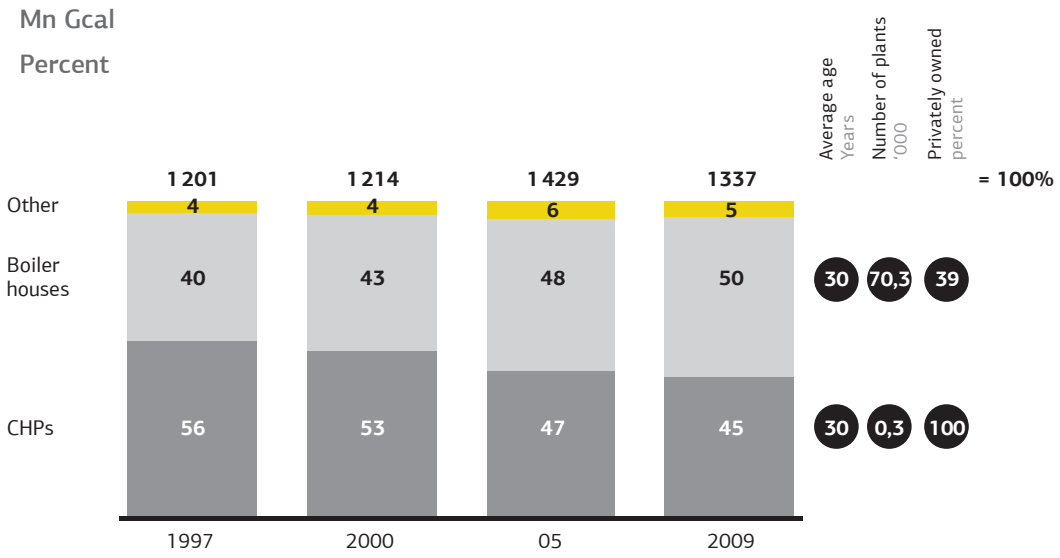
- The growth of average heat tariffs is ahead of inflation
- Transmission and distribution tariffs for heat account for a significant portion of the end-user tariff, which increases the importance of energy savings in obsolete heating mains
- The price of generated heat varies significantly even within a single region and often exceeds Western European tariffs
- For instance, in the Amur Region over 25% of all thermal energy is sold at prices exceeding those in Finland

[1] *Including all major producers of thermal energy which generate 54% of all heat in the Amur Region*
[2] *Assuming an equal split between generation and transmission tariffs for heat*

SOURCE: Federal State Statistics Service (Russia); Regional Energy Commissions; generation companies' annual reports

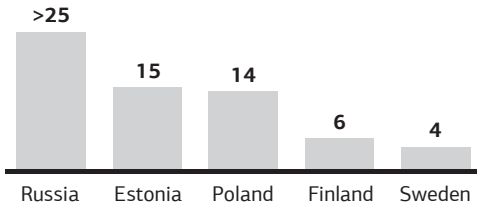
ANOTHER PRIORITY IS INCREASING ENERGY EFFICIENCY IN HEAT GENERATION AND TRANSMISSION

Centralized heat production in Russia



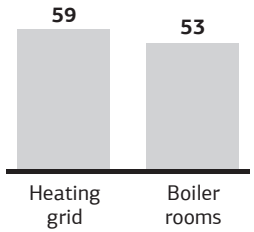
Losses of heat in heating mains

Percent, 2010



Share of heat infrastructure with age above technical norms

Percent, 2010



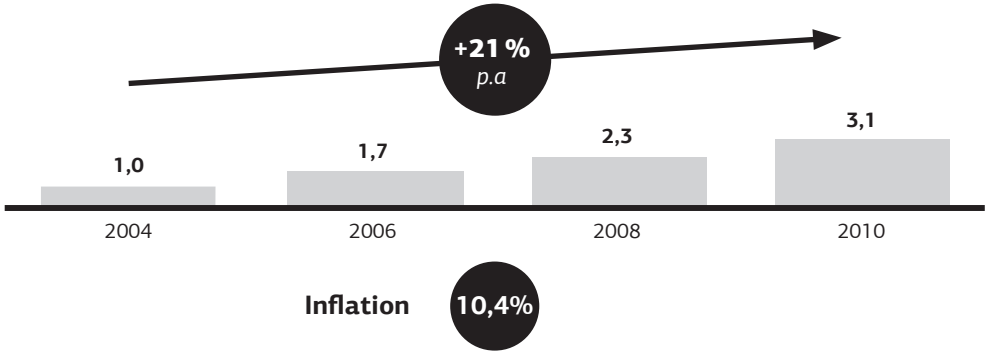
- The volume of heat generation by boiler houses outside the cogeneration cycle is growing, which is not efficient and opens up investment opportunities
- At the same time 60% of these facilities are publicly owned, which means they can be either bought or privatized with subsequent upgrades – this creates a huge new segment in the market
- The current level of heat losses is five times as high as in Europe; a boom in investments into heat grid refurbishment is expected in the coming years

SOURCE: Federal State Statistics Service (Russia); Ministry of Energy of Russia; Enerdata

QUESTIONS OF ENERGY EFFICIENCY ARE BECOMING INCREASINGLY MORE RELEVANT FOR THE POPULATION

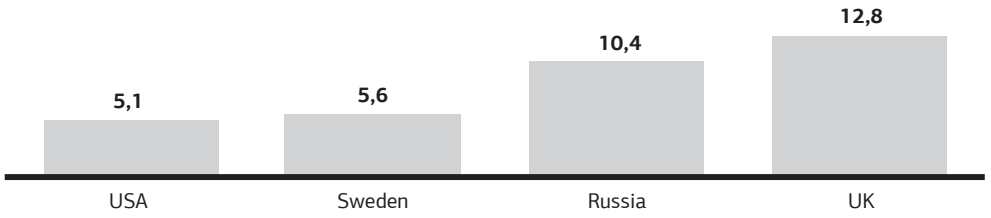
Average household spending on utility services[1] is growing ahead of inflation

RUB '000 per month



Share of utilities[2] in overall household spending

Percent, 2009



Questions of energy efficiency are becoming more relevant for the following reasons:

- Average spending on energy is growing ahead of inflation
- Utility services account for over 10% of total spending of the Russian population, which is twice as much as in the USA and only slightly less than in the UK

[1] *per household*
[2] *Utilities include gas, power, other types of fuel for residential heating and cooking, and water supply*

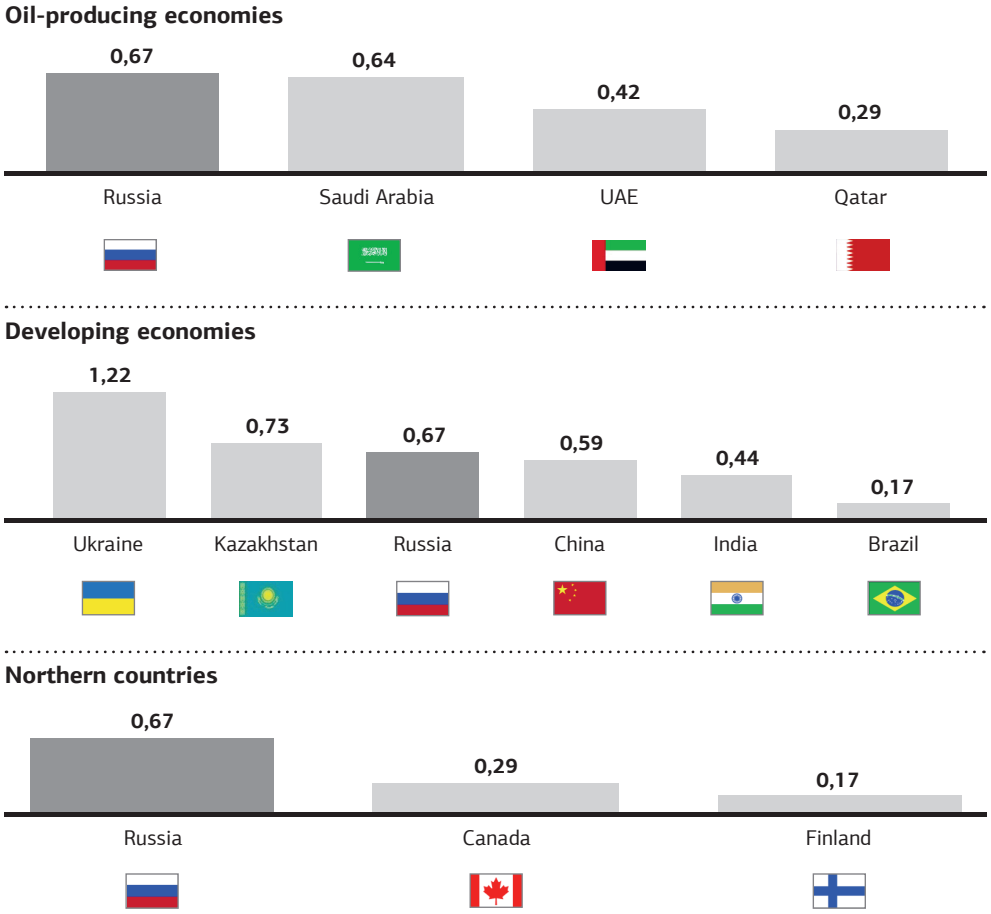
SOURCE: Federal State Statistics Service, Bureau of Labor Statistics (USA), Office for National Statistics (UK), Statistics Sweden

ENERGY EFFICIENCY IN RUSSIA: NEW OPPORTUNITIES

RUSSIA IS A “LEADER” IN TERMS OF ENERGY INTENSITY OF THE ECONOMY

Energy intensity of GDP

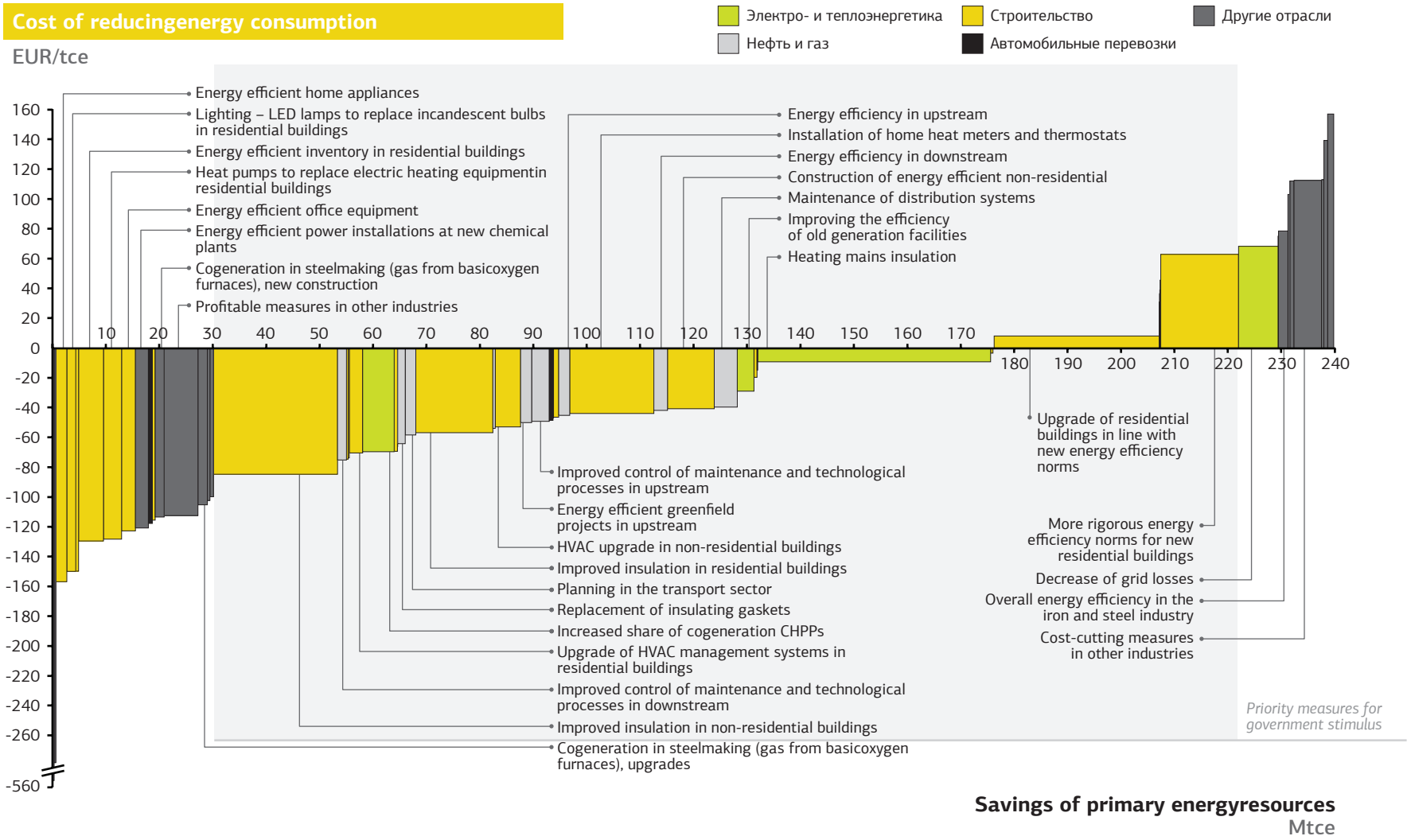
tce/USD ‘000, 2010



Russia is a «leader» in energy intensity of the economy among BRIC countries, countries with cold climates and countries with a similar reliance on natural resource extraction

SOURCE: EIU, BP statistics 2011

ENERGY EFFICIENCY CURVE, 2020



SOURCE: McKinsey

ESTIMATED SIZE OF INVESTMENT IN ENERGY EFFICIENCY MEASURES IN THE RUSSIAN RESIDENTIAL SECTOR WITH PAYBACK PERIOD OF 5 YEARS — ABOUT 4 BN USD

	Assets	Number of assets[1] '000	Share of attractive assets for investment[1] Percent	Savings potential Mtce	Investment potential[2] USD Mn
	Residential housing built less than 16 years ago	216	~10	0,35	151
	Residential housing built between 16 and 40 years ago	1 416	~70	5,91	2 578
	Residential housing built over 40 years ago	1 592	~30	2,22	967
	Central heating units	30,4	~50	2,34	299
	Overall potential			10,8	3 995

List of recommended measures for the residential sector and utilities

- Installation of heat-reflective screens in public spaces
- Replacement of incandescent light bulbs with compact fluorescent bulbs in public spaces
- Installation of heat metering and weather-based distribution units
- Installation of frequency regulation drives in utility systems
- The list is based on the assumption of fast payback of measures in 5 years, in the absence of this requirement the investment and energy savings potential is higher

[1] *Assuming the implementation of measures with a payback period under five years trialed in pilot projects*
[2] *Assuming that all measure with payback less than 5 years are realized*

SOURCE: Federal State Statistics Service (Russia); Energy Efficiency Working Group of the Commission of the President of the Russian Federation

ESTIMATED SIZE INVESTMENT IN ENERGY EFFICIENCY MEASURES IN THE RUSSIAN PUBLIC SECTOR WITH PAYBACK PERIOD LESS THAN 5 YEARS– MORE THAN 2.7 USD BN

	Type of facility	Number of assets[1], '000	Penetration potential1, percent	Energy savings potential, Mtce	Investment potential[2] USD bn
	Preschool facilities	45,6	~41	895	484
	Schools	50,3	~42	2 647	1 495
	Tertiary education institutions and colleges	4,0	~50	708	224
	Healthcare institutions	32,8	~30	519	134
	Administrative buildings	7,8	~50	386	372
	Overall potential			5 156	2 709

List of recommended measures for the public sector

- Replacement of incandescent light bulbs with energy saving lamps
- Overhaul of outdoor lighting systems
- Installation of heat-reflective screens
- Replacement of outdoor lighting systems
- The list is based on the assumption of fast payback of measures in 5 years, in the absence of this requirement the investment and energy savings potential is higher

[1] *Assuming the implementation of measures with a payback period under five years trialed in pilot projects*
[2] *Assuming that all measure with payback less than 5 years are realized*

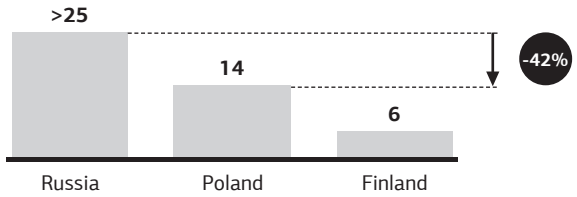
SOURCE: Federal State Statistics Service (Russia); Energy Efficiency Working Group of the Commission of the President of the Russian Federation

REDUCTION OF HEAT LOSSES IN TRANSMISSION CAN IMPROVE ENERGY EFFICIENCY BY 10%

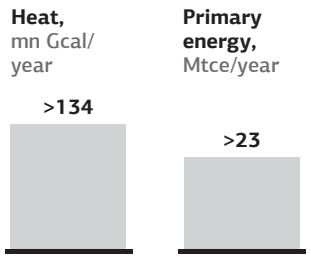
Russia has great potential with respect to decreasing heat losses

Heat losses in the grid,
percent

Decrease of losses
to Polish levels

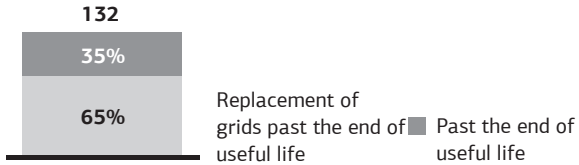


Savings potential[1]

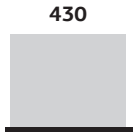


Leveraging this potential will require significant investment

Length of grids,
'000 km



Necessary investments[2]**,**
RUB bn



- Russia is a "leader" in heating mains losses
- If Russia decreases heat grid losses to Polish levels, the country will save over 10% of its heat energy
- The great length of deteriorated grids creates significant investment opportunities

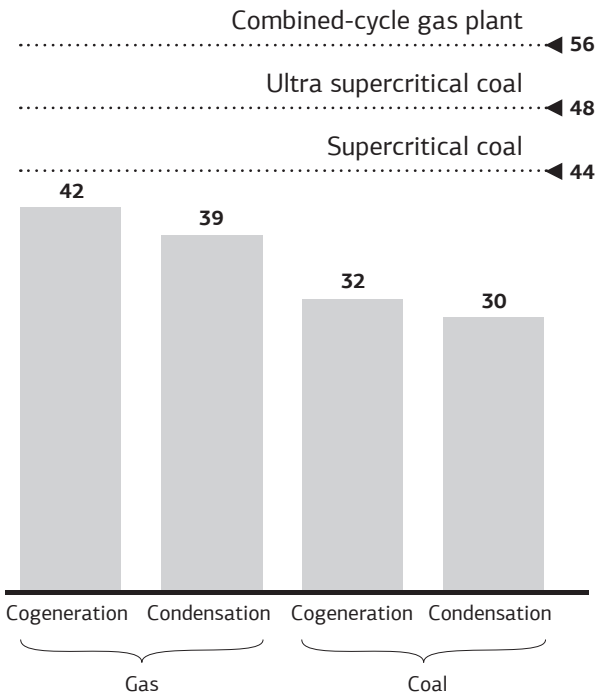
[1] *Assuming Russian decreases heat grid losses to Polish levels*
[2] *Replacement of grids past the end of normative life*

SOURCE: Federal State Statistics Service (Russia)

MANY OF RUSSIA'S POWER GENERATION FACILITIES ARE TECHNOLOGICALLY OBSOLETE

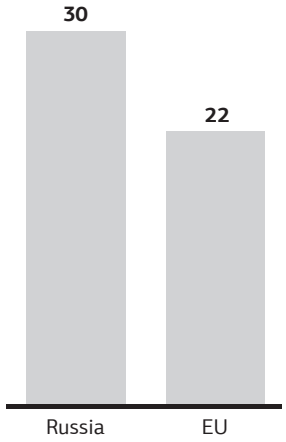
The average efficiency rate in Russia is much lower than that of new plants

Percent



Share of facilities over 40 years old

Percent



The average age of generation plants is much greater than the corresponding figure in Europe. The efficiency rate of obsolete plants is much lower than that of modern plants

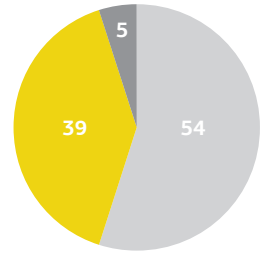
SOURCE: McKinsey, IEA, Federal State Statistics Service (Russia)

THE MODERNIZATION OF BOILER HOUSES IS A KEY LEVER FOR INCREASINGENERGY EFFICIENCY

Key levers	Description

TRANSITION TO GAS AND SOLID FUEL

Share of boiler houses by type of fuel
Percent



Solid Liquid Gas

- 3 400 boiler houses use liquid fuel
- The consumption of liquid fuel is 7.5 mil. ton a year
- Potential primary power savings due to transition from liquid to gas fuel are 1.3 mil. tce[1]

TRANSITION TO COGENERATION

Share of boiler houses with cogeneration
Percent

Other Cogeneration

- Less than 2% of boiler houses operate in cogeneration mode
- Potential primary energy savings if the share of cogeneration doubled are 0.82 mil. tce[2]

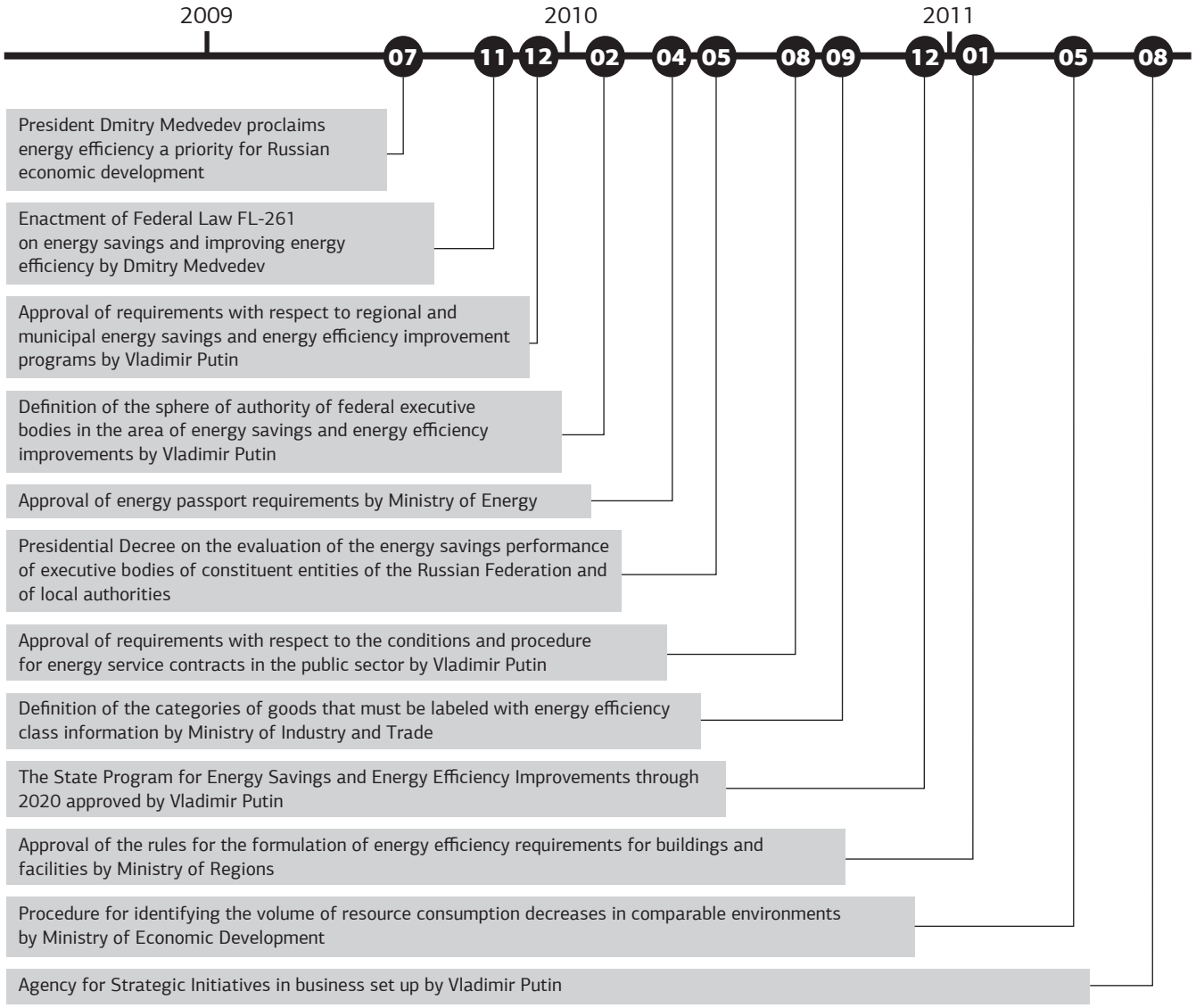
Boiler houses transition to gas and solid fuel and the use of cogeneration mode can help achieve signi-ficant energy savings

[1] *Assuming half of boiler houses on liquid fuel transition to gas, heat rate by fuel type is average heat rate of OAO «Sahalinskaya Kommunalnaya Kompania» in 2010*
[2] *Average heat rate of CHPs (166 kg/Gcal) and boiler houses (219 kg/Gcal) are used*

SOURCE:Federal State Statistics Service (Russia); annual report OAO “Sahalinskaya Kommunalnaya Kompania”

ENERGY EFFICIENCY IN RUSSIA: NEW OPPORTUNITIES

LEGISLATIVE REFORM CONCERNING ENERGY SAVINGS



- In a year and a half, federal ministries and regulators developed and enacted over 50 regulatory acts
- The reform of energy savings legislation is mostly completed
- The completed legal base has created an environment for the

LEGISLATION CHANGES. NEW OPPORTUNITIES (1/2)

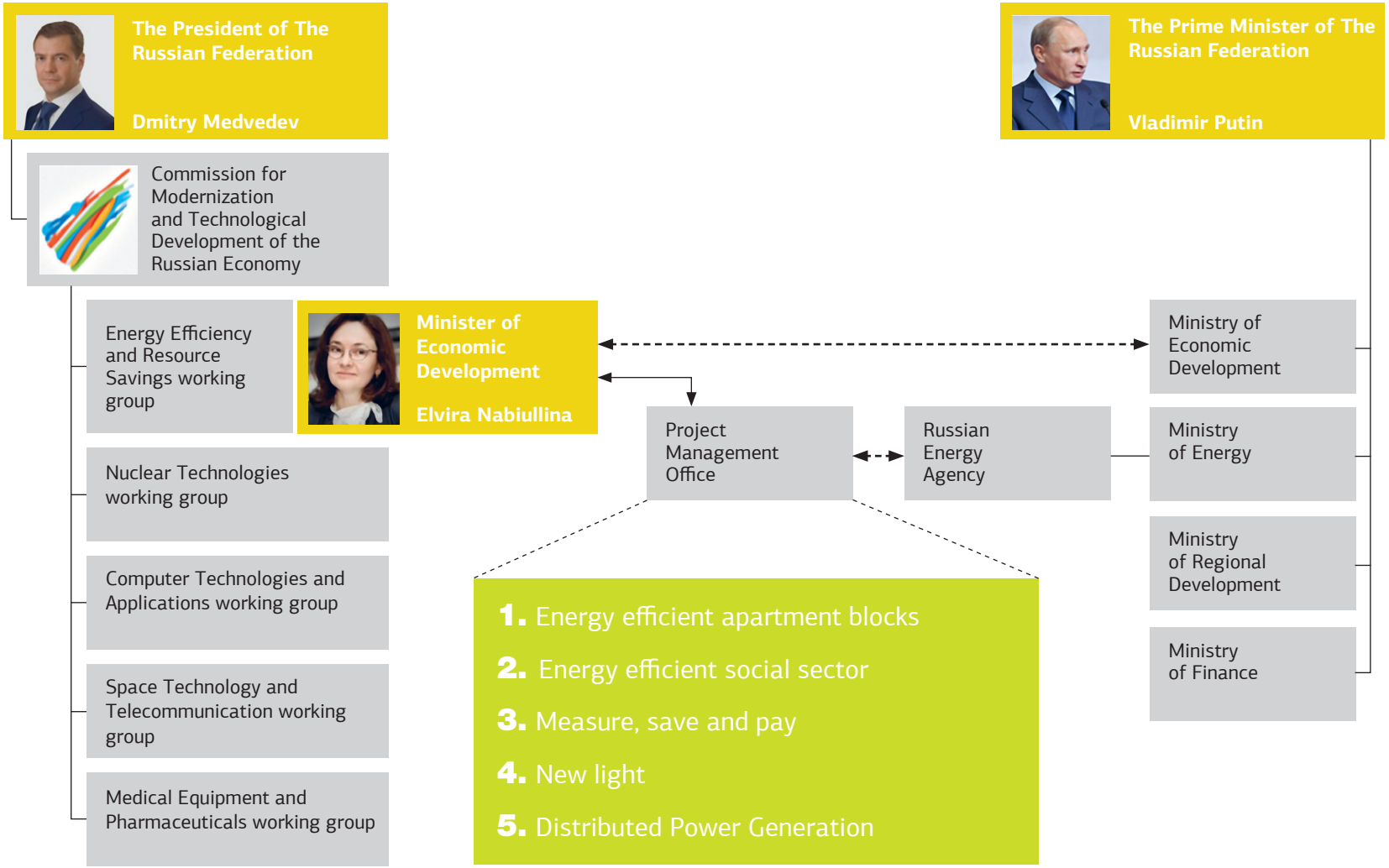
Area	Key legal provisions	Impact of current legislation
PUBLIC SECTOR	• Budget funded entities are obliged to decrease energy resource consumption by 15% between 2010 and 2015 (3% per year) • Budget funded entities are to pay for energy resources on the basis of metering data starting in 2011	• Public servants are to lower entities' energy consumption • Organizations will pay for resources on the basis of actual consumption • Incentive: savings lead to higher wages
	• Budget funded entities must conduct an initial energy audit before the end of 2012 and repeat it every five years	• Investment activities and projects in the public sector are developed on cost-effective bases
6 *regulations enacted*	• Energy service contracts conditions, forms and requirements with respect to the contracting procedure in budget funded entities have been defined • Budget funded entities' energy service contracting and accounting procedures have been approved • The methodology for assessing the impact of measures in comparable environments has been developed	• Recommended energy saving solutions for the public sector have been approved • Regional and municipal governments have instructions regarding expenditure planning with reference to savings • Energy saving assessing and calculating methodologies approved by federal law
RESIDENTIAL SECTOR AND HOUSEHOLDS	• Energy efficiency requirements for buildings and facilities and energy efficiency classes determination rules have been approved	• New buildings and projects are designed with reference to energy efficiency requirements
	• The types and characteristics of goods for which energy efficiency class must be stated have been approved • Energy efficiency class is to be labeled on the goods packaging	• People clearly see energy efficient classes of goods in the stores • Incentive: choose efficient goods and save on household energy payments
15 *regulations enacted*	• Households are to pay for energy resources on the basis of metering data from mid-2012	• New incentive: significant savings on utility payments for the family budget

ЗАКОНОДАТЕЛЬСТВО И ИЗМЕНЕНИЯ. НОВЫЕ ВОЗМОЖНОСТИ (2/2)

Area	Key legal provisions	Impact of current legislation
INDUSTRY **3** *regulations enacted*	• Large consumers and regulated companies must conduct an initial energy audit before the end of 2012 and repeat it every five years • The Ministry of Energy has registered over 100 self-regulating organizations with a membership of over 4,000 energy auditors • Energy passport requirements and issuance procedure have been approved	• Investment activities and energy efficiency projects are developed on cost-effective bases • Energy auditor qualifications requirements have been determined • Energy efficiency measures feasibility reports are aggregated to develop best practices
POWER AND TRANSPORT **16** *regulations enacted*	• Requirements with respect to programs for energy savings in regulated companies issued by The Federal Tariff Service • Programs for energy savings in regulated companies are being monitored	• Overall system-based approach for energy efficiency implementation in power generation and distribution industry is underway
OVERALL	• Requirements with respect to regional and municipal programs for energy efficiency have been approved, a variety of cost-effective measures have been recommended for inclusion into these programs • Regional and municipal programs for energy efficiency have been approved in 2010	• Overall multilevel energy savings incentive framework and state investments tools set up
8 *regulations enacted*	• Performance indexes and controlling procedures for state-driven energy efficiency measures have been approved for government bodies at all levels	• Incentive for government bodies: energy efficiency is a key lever of modernization

ENERGY EFFICIENCY IN RUSSIA: NEW OPPORTUNITIES

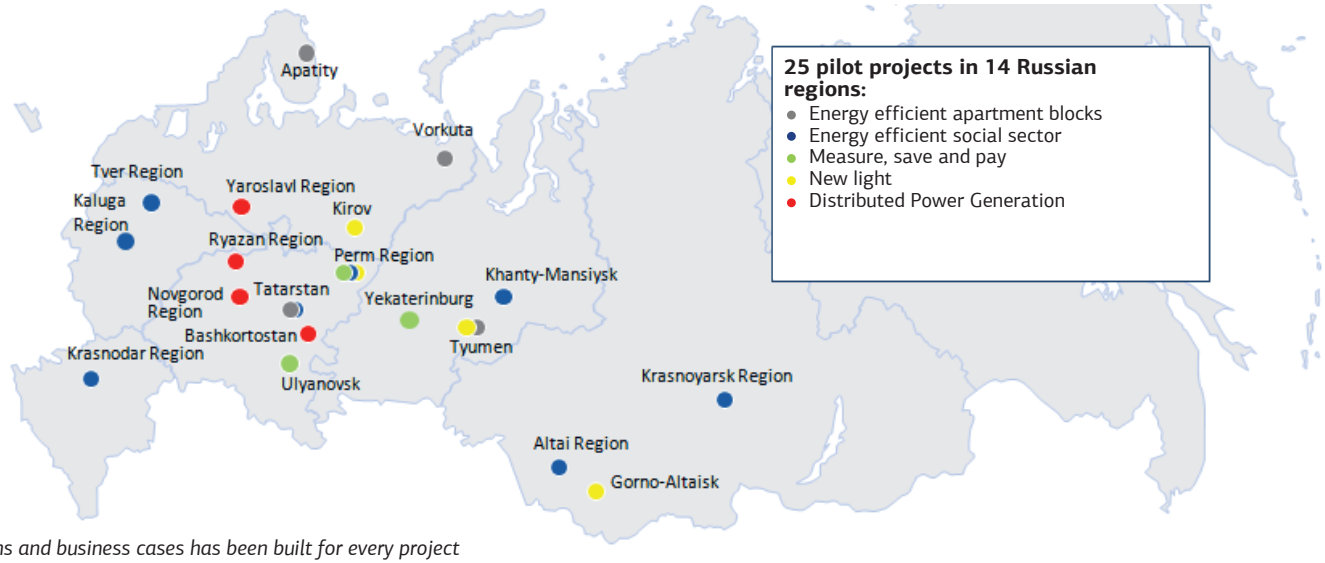
COMMISSION FOR MODERNIZATION AND TECHNOLOGICAL DEVELOPMENT



SOURCE: http://i-russia.ru/

PILOT PROJECTS OF THE ENERGY EFFICIENCY WORKING GROUP

Energy efficient apartment blocks	Pilot projects in apartment blocks implemented in Tyumen, Kazan, Vorkuta, Apatity	**Thermal energy savings: 20%** **Power savings in stairwells: 40%**
Energy efficient social sector	Pilot projects conducted and energy service contracts signed in public-sector organizations in the Kaluga, Nizhny Novgorod and Tver Regions, Tatarstan, the Khanty-Mansiysk Autonomous District and the Perm Territory	**Thermal energy savings: 25%** **Power savings for lighting: 15%**
Measure, save and pay	Demand for metering equipment assessed, pilot Smart Metering project executed	**87% of public-sector organizations equipped with metering units**
New light	Solutions to improve the performance of lighting systems in residential housing and other areas trialed in Kirov, Gorno-Altaysk, Perm	**Impact after roll-out: 37bn kW-h**
Distributed Power Generation	Operational and financial replicable blueprint for modernizing obsolete boiler houses with transition to cogeneration mode developed in the Yaroslavl, Smolensk, Sverdlovsk Regions and Bahskortostan	**The expected payback period for the project is 7-8 years**



[1] *A library of technological and organization solutions and business cases has been built for every project*

SOURCE: Energy Efficiency working group of the Commission of the President of the Russian Federation

RUSSIAN ENERGY AGENCY

Goals

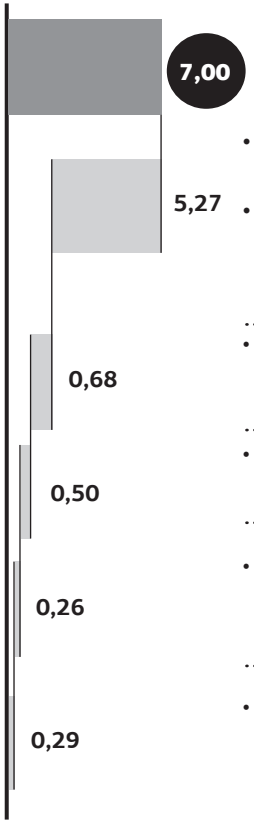
- Improve the effectiveness of public policy in the areas of energy efficiency and energy savings
- Serve as a point of contact and as unifying body of all activities in energy efficiency space in Russia from setting normatives to developing public policy
- Improve the investment attractiveness of the electric power industry

Activities

- Informational and analytic support in the areas of fuel and energy industry, energy efficiency, renewable energy sources
- Development of regional, municipal, public-sector and corporate programs to improve energy efficiency, supporting the implementation of these programs
- Coordination of international cooperation in the areas of improving energy efficiency and renewable energy sources
- Organization of events to raise awareness and providing training related to energy efficiency issues
- Methodological support in the areas of energy efficiency and renewables
- Expert analysis and support for projects in the areas of energy efficiency and renewables
- Support energy service activities and attracting financing
- Support innovations and research in the fuel and energy sector, energy efficiency and renewables
- Encourage the creation of Russian manufacturing capacity and technology transfer in the areas of energy efficiency and renewables

IMPLEMENTATION LEVERS FOR THE PUBLIC PROGRAM

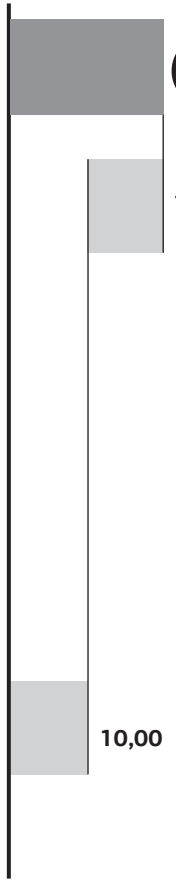
Public financing



RUB bn in 2011

- Best energy efficiency programs chosen in a competition among constituent entities of Russia
- Subsidies from the federal budget allocated in proportion to regional budgets' allocation to the implementation of programs, up to RUB 500mn per region
- Creation of a state information system to record energy passports and track the performance of energy efficiency programs
- Awareness campaign to encourage saving behavior in the country
- Training of staff responsible for energy efficiency in regional executive bodies and local authorities at the municipal level
- Other costs

Public guarantees for loans financing energy efficiency projects (within the framework of long-term target agreements)



RUB bn per year

- The aim is to launch the roll-out of proven generic designs in the utilities sector (payback periods of under 5 years)
  - *Installation of regulating units*
  - *Installation of local heating facilities for public-sector organizations*
  - *Replacement of incandescent light bulbs*
  - *Installation of frequency regulation drives at central heating facilities*
  - *Overhaul of outdoor lighting systems*
  - *Installation of metering equipment*
- The guarantees will be given to banks, ensuring low interest rates for financing sample projects and kick-starting the energy service mechanism
- The aim is to encourage businesses to execute energy efficiency-related projects. The guarantees will allow businesses to get access to preferential terms, so that energy efficiency projects receive high priority. Guarantee volume by year:
  - *2011 – RUB 5bn*
  - *2012 – RUB 10bn*
  - *2013 – RUB 10bn*
- The value of the guarantee is at least RUB 1bn

[1] *Starting from 2012; in 2011, the guarantees amount to RUB 10bn pro rata*

SOURCE: Energy Efficiency working group of the Commission of the President of the Russian Federation

BUDGETARY SUPPORT FOR ENERGY SAVINGS IN 2011

FEDERAL BUDGET

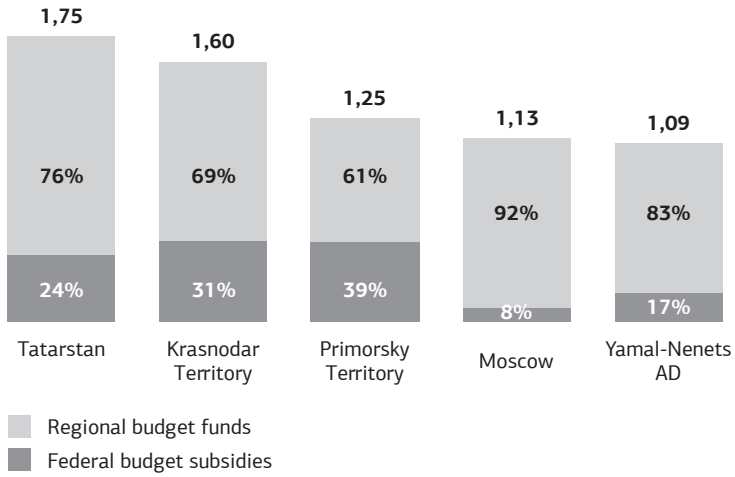
The planned funding for the implementation of the state energy savings and energy efficiency program is RUB 7bn in 2011. Key directions

- Subsidies to regions for co-financing energy efficiency
- State information system
- Comprehensive awareness campaign
- Expert training

- Responsibility for program implementation rests with the Ministry of Energy

REGIONAL BUDGET

Budgetary support for energy savings
RUB bn, 2011



- Regional budget funds in 2011- RUB 12.2bn
- Federal budget subsidies in 2011- RUB 5.27bn

Key items

- Co-financing of equipment installation and the implementation of measures in the residential sector
- Energy audits, public sector reporting
- Subsidized metering equipment for the population
- Modernization of boiler rooms and reference electrode units
- Subsidies to municipalities

SOURCE: Russian Energy Agency, working group on energy efficiency

ENERGY SAVINGS PROGRAMS IN REGULATED ORGANIZATION — EXAMPLES

Company name	Program description
РЖД	• Three large energy efficiency improvement programs implemented - Application of LED equipment (investments of more than RUR 220 million) - Improvement of the system of fuel and energy resources - Energy savings in transportation process • Next steps include comprehensive energy savings innovative products, including implementation of LED equipment, hydrogen power, nanotechnology • Contract on cooperation in the area of energy efficiency with the European Bank of Reconstruction and Development
TRANSNEFT ТРАНСНЕФТЬ	• Energy efficiency program for 2012 – 2015 - Optimization of technological process of oil transportation and storage - Application the electric equipment with higher efficiency ratio - Wide application of thermal insulation - Introduction of GLONASS monitoring to reduce the motor fuel consumption • Energy savings program implementation will allow to ensure the savings of fuel and energy resources for 2010 - 2015 by 12% as compared to 2009
РусГидро	• Energy savings program for 2010 – 2015 - Power efficiency improvement at a construction stage – use of local types of fuel, application of thermal insulation materials for winter concrete placing - Reduction of technological losses of operating units and of energy consumption - Power savings in sales: decrease in technological and commercial losses of power energy and improvement of accounting for energy resources - Energy audit (conducted for 16 Hydro power stations)
"ФСК ЕЭС"	• Energy savings program for 2010 – 2012 - Decrease of grid losses, smart grids - Equipment of sites with accounting devices - Decrease of the consumption of electric power and heat in buildings and constructions - Energy audit

SOURCE: corporate internet sites

ENERGY EFFICIENCY IN RUSSIA: NEW OPPORTUNITIES

IN THE LAST 2 YEARS OVER 8 BLN USD WERE GIVEN BY OVER TEN NEWLY CREATED FINANCING FUNDS

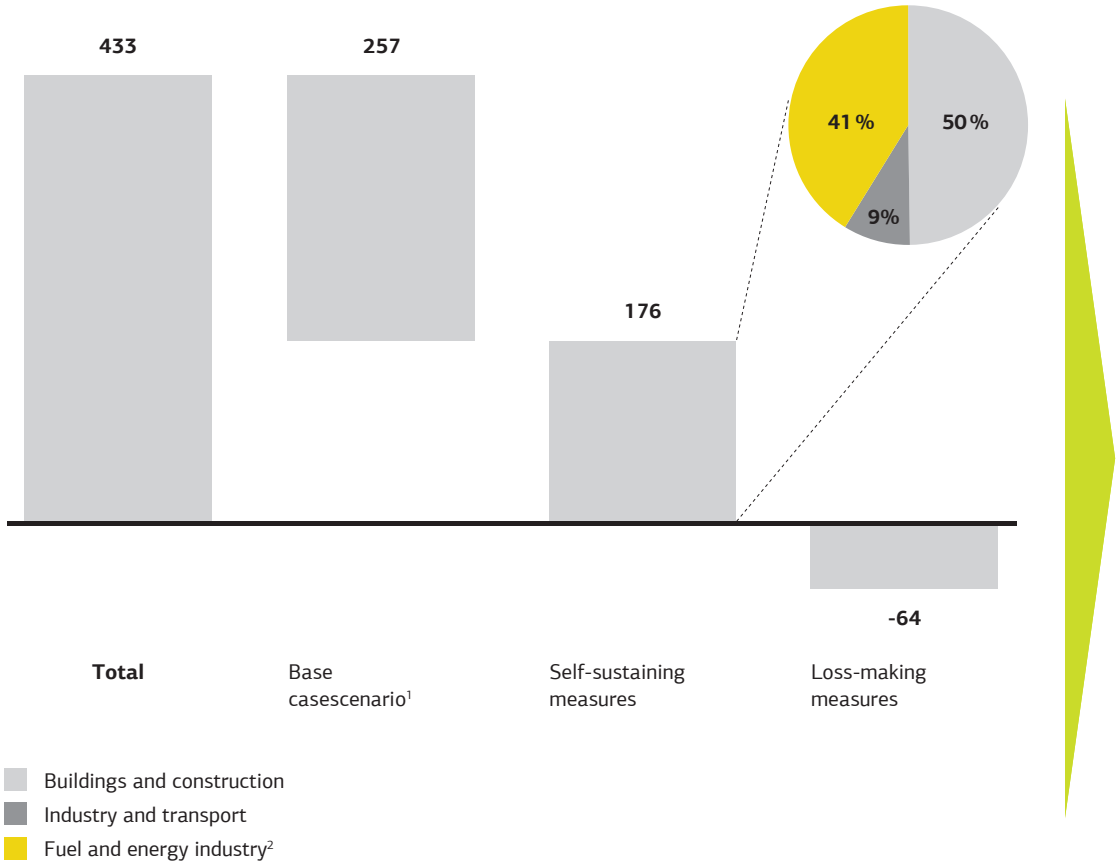
- There is a significant number of institutes which finance energy efficiency projects at different stages of project lifecycle
- Various instruments for financing by state of already started projects and grants in R&D in energy efficiency
- A high number of energy efficiency projects are already being financed now

ENERGY EFFICIENCY IN RUSSIA: NEW OPPORTUNITIES

POTENTIAL FOR REDUCED ENERGY CONSUMPTION IN 2020 DUE TO ENERGY EFFICIENCY MEASURES

Overall fuel savings in 2020

Mn tfe



More than 40% of fuel savings can be achieved via profitable measures, which are approximately evenly split between buildings and the fuel and energy industry

[1] Savings due to necessary economic modernization via equipment upgrades
[2] Including the oil and gas industry

SOURCE: McKinsey estimate

DESCRIPTION OF INVESTMENT PROGRAMS FOR ENERGY EFFICIENCY PROJECTS IN RUSSIA

Name	Amount of investment	Investment programs	Examples
РОСНАНО Российская корпорация нанотехнологий	• Total amount of RUB 130 bn	• Co-investing in nanotech projects with a significant economic or social potential	• ZAO Optogan – development and manufacturing of ultra bright LEDs based on nano-heterostructure technology (RUB 2.3 bn) • OOO Liotech – production of new-generation LI batteries for electric transport and power industry in Russia (RUB 7.6 bn)
РОССИЙСКАЯ ВЕНЧУРНАЯ КОМПАНИЯ	• Total amount of RUB 30 bn • RUB 12 bn invested	• Investments into venture capital funds	• BrightSource Energy – development, production and sales of systems for converting solar energy into electric power and heat energy • ZAO Hydraulic Power Machines – production and sale of rotary vortex plants for hydraulic power industry and mining operations • ZAO Seismoshelf – developer of a technology for complete seafloor seismic exploration
РОССИЙСКИЙ ФОНД ПРЯМЫХ ИНВЕСТИЦИЙ	• Total amount of USD 10 bn	• Investments into leading companies in the highest-growth sectors	

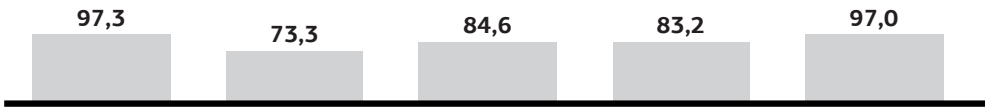
DESCRIPTION OF GRANT PROGRAMS FOR ENERGY EFFICIENCY PROJECTS IN RUSSIA

Name	Amount of investment	Investment programs	Examples
Сколково	• Over RUB 1 bn has been allocated (2011)	• Support for projects at all stages from design concept to development of an industrial equipment prototype • Provision of tax benefits for innovative projects • Provision of grants for projects selected according to the Fund's procedures	• OOO STM Innovation Development Center – development of a prototype SinaraHybrid (TEM9N) shunting locomotive with intelligent asynchronous hybrid drive – RUB 35 mn • ZAO Elton – establishing production of asymmetric electrochemical condensers with aqueous electrolytes • OOO FM Lab – development of basic technologies and structures for production of lithium-air rechargeable chemical current sources for mobile applications and electric transport
АГЕНТСТВО СТРАТЕГИЧЕСКИХ ИНИЦИАТИВ	• It is planned to provide VEB guarantees and subsidize loan interest rates for projects	• Assistance in promotion and implementation of unique business projects • Support of unique socially important projects and initiatives of medium-sized businesses • Promotion of development projects for social institutions, including socially oriented non-profit organizations	• Project selection is to start in November 2011

SITUATION WITH METERING EQUIPMENT IN RUSSIA

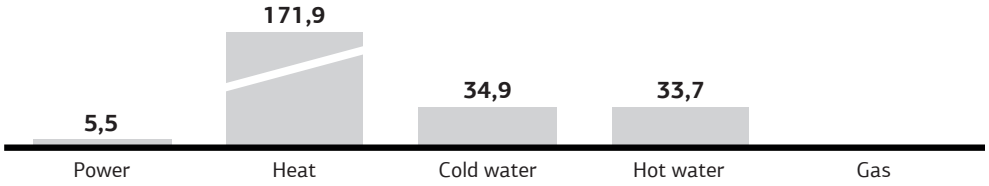
Penetration of energy resource metering equipment in the Russian Federation
September 11, 2011

Share of public-sector organizations equipped with metering units
Percent



Share of apartment blocks equipped with metering units
Percent

Potential for investment in installing metering equipment to track consumption by the entire building
RUB bn



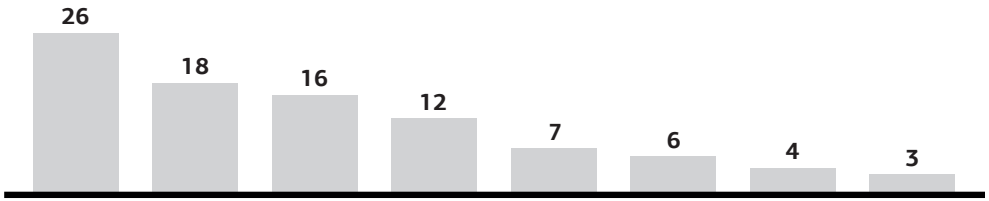
- Despite the expiration of the deadline for installing metering equipment in the public sector (January 2011), the average penetration of metering equipment still stands at 87%. At the same times the deadline for installation in the residential sector (July 2012) is approaching, with current coverage at 31%
- The market for metering equipment in Russia is large, with a volume of over RUB 250bn, chiefly accounted for by equipment tracking consumption by entire buildings
- Demand for these products has grown significantly due to the short deadlines for installing the equipment
- An interesting market segment is the installation of metering equipment allowing remote readings, including Smart Metering solutions in the public and residential sectors

SOURCE: Commission for Modernization analysis

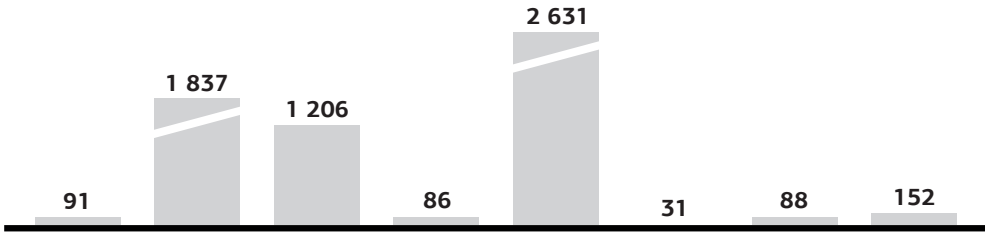
TODAY ONLY A SMALL FRACTION OF BUILDINGS HAVE BEEN SUBJECTEDTO AN ENERGY AUDIT

Energy audits, 2011

Share of budget funded organizations that have passed an energy audit
Percent



Number of apartment blocks in different Russian districts that passed an energy audit
Number of buildings (2010)



- The energy audit market in Russia is substantial: public-sector organizations are to pass an initial energy audit be-fore the end of 2012 and repeat it every five years. This measure involves over 50,000 buildings in the public sector
- Energy audits of residential houses are not obligatory, but conducting such an audit and getting an energy passport are an appropriate step towards further energy saving measures
- The demand for services has grown significantly due to the short deadlines for energy audits for some customer groups

SOURCE: Russian Energy Agency, Commission for Modernization analysis