



Energy Tariffs, Ways of Their Reducing Through Implementing Energy Saving Technologies in Production

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‘Russkie mashiny’ (Russian Machines) corporation is:

- Consolidated industrial assets in the field of automotive industry, railway engineering, aircraft manufacturing, military vehicles, special-purpose machinery;
 - 26 enterprises in 14 Russia’s regions with a number of more than 40 000 working people;
 - Largest enterprises of machinery industry and industrial regions of Russia: ‘GAZ’ OAO (Nizhegorodsky Region), Ural plant (Chelyabinsky Region), Avtodizel (Yaroslavsky Region), etc.



Corporation enterprises as energy resources consumers:

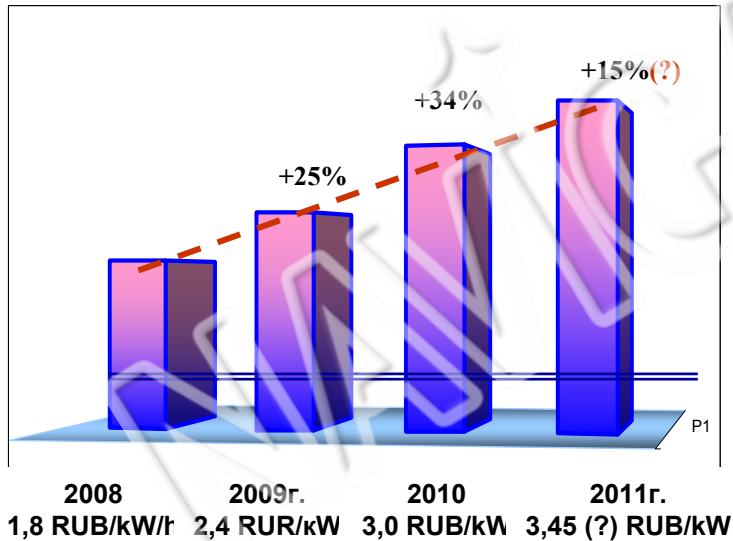
- *Use energy resources in the amount of more than 6 bln. ruble annually;*
- *Have large volume of infrastructural assets, including power and heat generation, power and heating network, substations, gas-supply grids, and other communications; assets are to be renovated and modernized; they are excessive in volume of generation and transfer of energy resources.*
- *Have strongly marked inequality of power load, either in daily or monthly intervals arising from the specific production and the change of production programs.*



1.

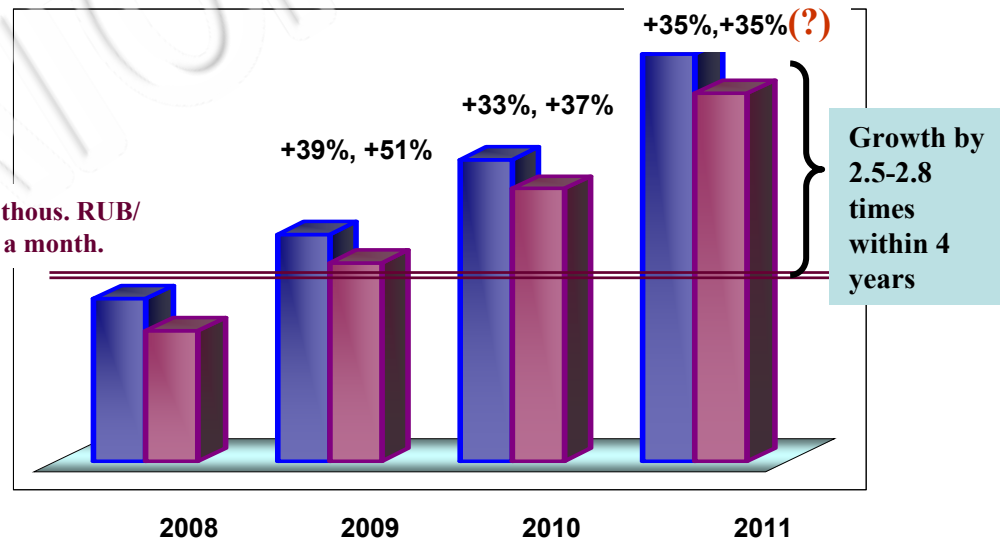
Growth of electricity tariffs including payments for distribution grid

Growth of average electricity tariffs for industrial consumers significantly exceed inflation rate and average growth rate for all Russian consumers. For **Russian Machines (PM)** enterprises the tariff growth constituted:

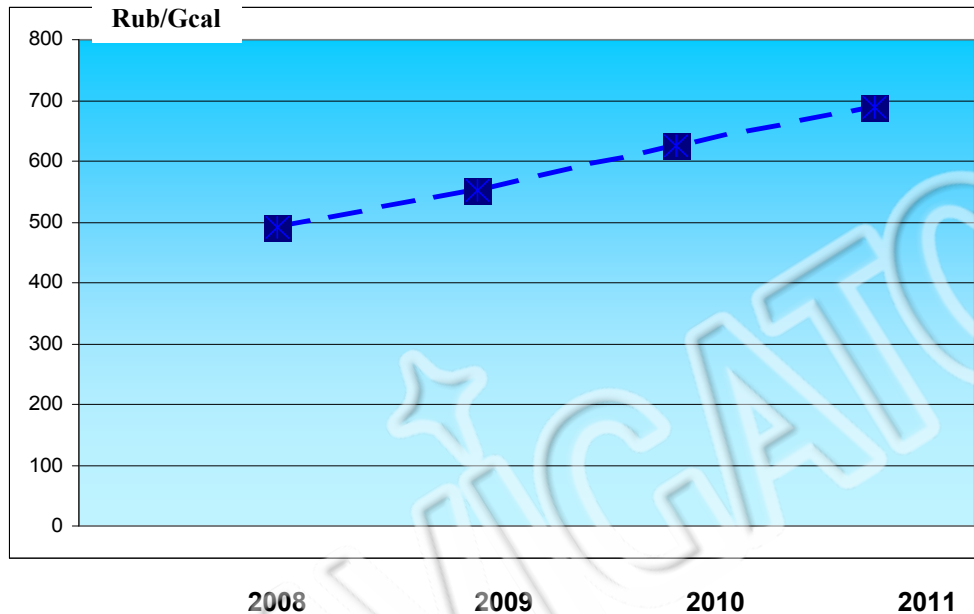


Some tariffs components grow by 35% -51% per year. Payments growth to maintain networks of boiler tariffs for electricity transmission:

■ Nizhegorodsky Region ■ Yaroslavsky region



2. Tariffs growth for heat energy



**Growth makes 41%
in 4 years**

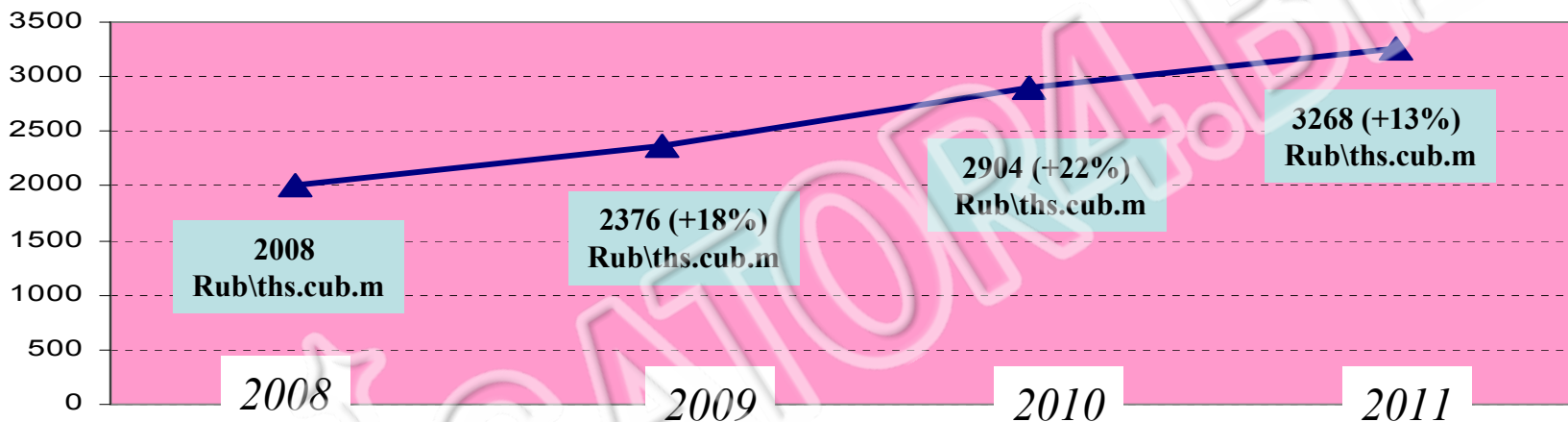
! *Despite the relatively moderate tariff growth rate, expenditures on heat energy are considerable, and the available convective heating system for the production buildings is ineffective and costly.*

**In 2009, the decrease of energy consumption was from 14% to 42%,
The overall value remained almost unchanged, while the share of energy resources
in prime cost grew by 2.7%**



3.

Growth of tariffs for natural gas



From 2014, the Russian Federation is shifting to domestic gas pricing based on equal return of fuel sales revenue in Russia and Europe. From 2008 Federal Tariff Service (FST) calculates and publishes new prices. The current prices and calculated by FTS prices based on equal return of sales revenue (in the brackets) are given below for comparison,

RUB per thousand cubic meters

Nizhegorodsky Region: 1Q 2010 - 2931 (5465), 2Q - 2748 (4138), 3Q - 2574(4204).

Shift to new prices is performed annually in rates exceeding inflation.





Price increase of
energy resources for
industry
is it inevitable?

OR

Increase of
energy resources for
industry
is it a booster for development?

What a Russian industrial consumer should do
to keep expenses on energy resources in prime cost
on a competitive level?

Apply energy efficient and
energy saving technologies

considerable non-recurring
investments
ARE NEEDED



Package measures programs to increase the energy efficiency are developed at each enterprise, taking into account implementation of new high-efficient technologies and decommissioning the old technologies and equipment in two key ways:



1. To reduce **cost** of energy resources consumed:

- installation of its own cogeneration;
- measures to change suppliers and terms of supply.

2. To reduce **volumes** of energy resources consumed :

- Change of technology (refusal from steam use, installation of modern smelting furnaces), localization of production;
- Use of up-to-date technologies on heating and illumination (give up traditional convective heating and shift to infrared heating, mounting up-to-date illumination systems with energy saving lamps);
- Installation of additional energy and resource saving equipment (machine and mechanisms variable frequency drives, increment starters installation);
- Organizational and technical measures focused to energy resources saving and energy consumption reducing.

Note: Implementation of energy saving technologies and decrease of energy consumption due to suppliers' persistent gross income will inevitably lead to further increase of energy tariffs.



- 1. Economy from decrease of electricity cost (up to 50-70%), due to suspension of payments:**
 - services on grids maintenance (including investments on grids modernization; cross-subsidization), losses in grids;
 - sales margins and infrastructural services;
 - expenses incurred by modernization of large power stations of power and heat suppliers.
- 2. Improvement of energy supply reliability (decrease of intermediates in power and heat supply).**
- 3. Generation of heat and power energy from exhaust gas utilization and removing from services inefficient boiler plants.**
- 4. Decrease of maintenance costs.**
- 5. Equipment unload of the own step-down substations.**



1. Effect at Yaroslavsky diesel facilities plant:

Annual economy - 180,5 mln. rub. + opportunity to sell the boiler's released heating power;

Decrease of electricity tariff rates from 2,7 RUB/kwh
up to 0,63 RUB/kwh

Payback period 4,6 years

2. Effect at Arzamassky engineering works (Nizhegorodsky Region):

Annual economy 157 mln. rub.

Decrease of electricity tariff rates from 3,0 RUB/kwh
up to 1,3 RUB/kwh

Payback period 3,7 years



**Gas engine generator plant on the territory of
Pavlovsky bus plant
in Nizhegorodsky region:**

The electric power station was put into industrial operation in 4Q 2009 with the aggregate capacity of 4 MW

Electricity tariff is more than by 40% lower than the tariff on electricity supplied by the guarantee supplier.

Annual effect is 6 mln. RUB



Problems of enterprises during implementation of energy efficient technologies

1. Necessity for considerable non-recurrent investments - in the substantial volume in particular from the proprietary sources of funding.

As per one's own generation:

1. Difficult to choose manufacturer and the optimal equipment configuration in "peak" load conditions and considerable change of production programs, as well as due to maximums' mismatching of the enterprises' electricity and heat load.

2. Price growth from domestic manufacturers of equipment, it's relatively low reliability. Lack of foreign manufacturers' servicing centers on the territory of the Russian Federation.

3. Necessary and continuous approval to build one's own generation with a large number of supervising governmental institutions.

Note: unless there are operating gas-supply system and sufficient volumes of natural gas supplied, the problem of fuel-supply for gas-turbine unit and IR heater is not relevant for Russkie mashiny OAO enterprises.



Terms for successful implementation of energy efficient technologies in the Russian Federation on industrial sites of energy resources consumers

- acceleration of legislative initiatives' realization in the field of energy saving, including tax legislation (tax credits, applying of accelerated depreciation of new equipment);
- increase of credit accessibility without primary contribution particularly, with repayment of credit from the received effect as per the so-called 'performance-contracts',
- increase of reliability and coefficient of efficiency of small-generation domestic equipment;
- lack of penalty for deviation from energy consumption targets at enterprises that implemented energy efficient technologies.



Thank you !

