

# e.on

# Ruhrgas



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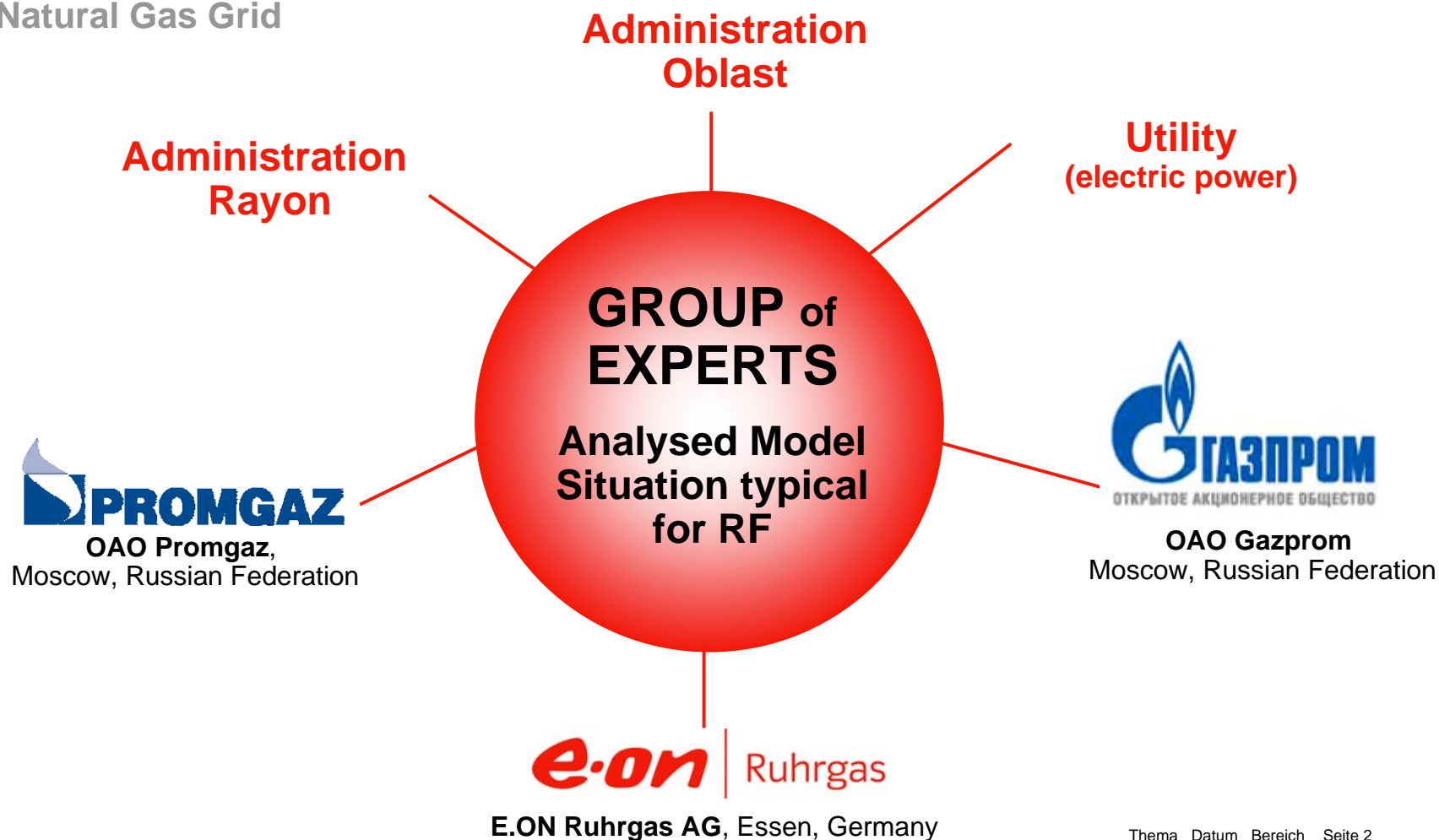
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**Steering Committee of the Energy Efficiency 21  
Project  
18th Session / Round Table: Focus on the  
Activity  
“Reducing Greenhouse Gas Emissions through  
Interfuel Substitution in RF”**

**Presentation May 2007**

**> The Importance of Connecting  
Small to Medium-sized Cities in the  
Russian Federation to the Natural Gas Grid <**

The Importance of Connecting  
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Connecting  
Small to Medium-sized  
Cities

in the Russian Federation to  
the Natural Gas Grid

**GENERAL**

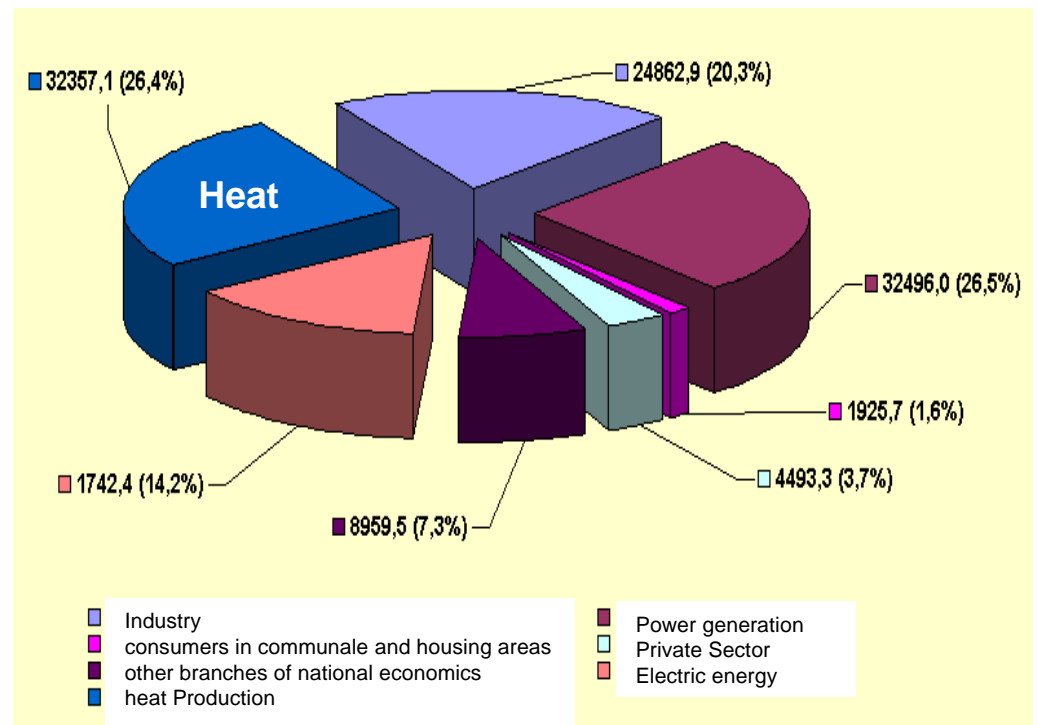
- **NG penetration in RF about 50% (average)**
  - high energy cost / economic breaks
  - for developing living standards ,breaks in'
  - available energies = high environmental burden (masut, lignite/brown coal, wood)
- **NG sound solution under all respects**
  - potentials obvious
    - inter fuel substitution
    - upgrading energy supply systems
    - improving enduse efficiency

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## Energy Saving Potentials (RF wide)

- Some 120 bln m<sup>3</sup>/a Natural Gas
- 1/4 thereof in field of Heat Production

*Even the longest journey.....*



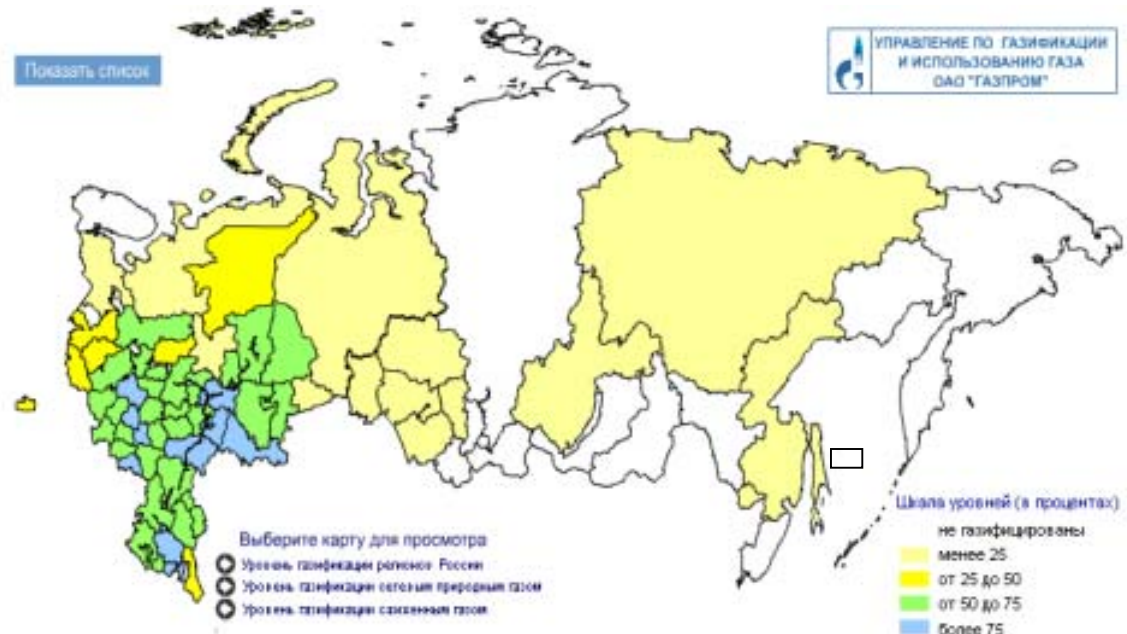
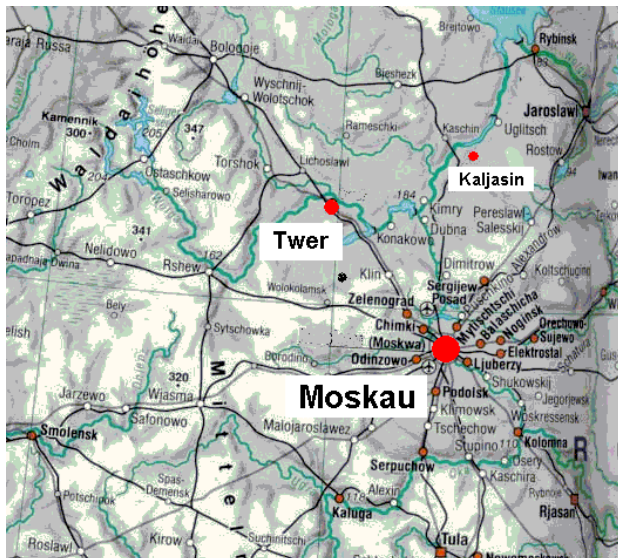
base 2003 statistics

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**Model Situation Kaljasin**

- typical rural
- < 20.000 inhabitants
- 200 km northeast Moscow
- quay for barges, railway link
- Industry (metal, food, textile)
- Fuel (oil, coal, wood, diesel, petrol)
- central Heating (masut)

***Even the longest journey starts with first steps !***



**State of Connection of RF-Regions to Natural Gas Networks:**

- Actually 64 of 89 Regions connected
- with NG Penetration 25 to 75 %

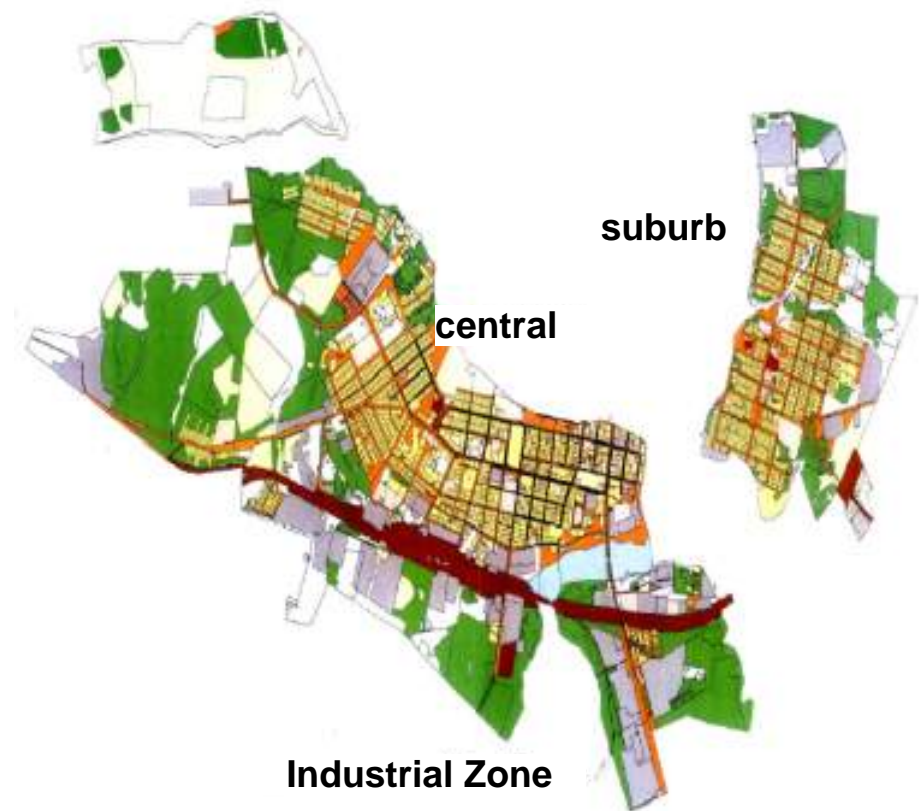
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## ***As-is Kaljasin City***

Energy Consumption:  
~ 20,000/a  
standard fuel units (~tce)

- light and heavy fuel oil
- coal, wood
- diesel, petrol

Electricity 35,000 MWh/a



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## *As-is Kaljasin City*

72 % of living space  
municipal property,  
housing around  
75 % of population

25 % of population  
private homes

no uninterrupted hot water supply



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## *As-is Kaljasin City*

### **Space Heat / 100 residential Bldg.**

- central boiler station
- some 20 small local boiler plants (municipality operated)

remaining 500 residential Bldg.

- Stoves
- Electrical\*) heating systems

\*) Electrical energy purchased externally for distribution through the municipality's own grid



### **Industrial Heat**

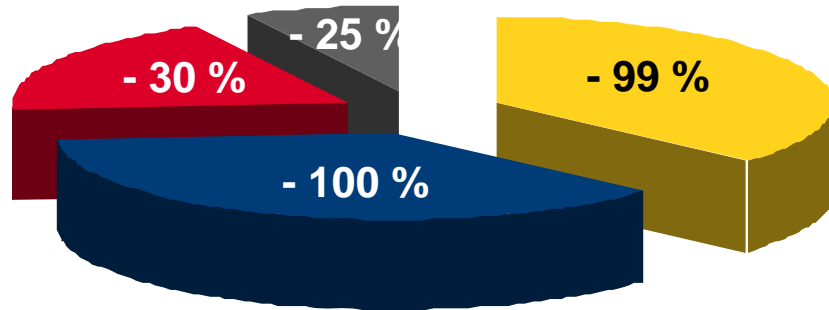
- 22 boiler plants (industry operated)

Production wastes fired

- Wood chips
- flax processing waste

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## *Expectations Kaljasin City*



■ sulphur dioxide      ■ dust/particle  
■ nitrogen oxides      ■ carbon oxide

(round figures / Graphic not to scale)

## **Environmental benefits**

from bringing NG into rural regions:

- *Dust and particle emissions* to almost zero in the long term
- *sulphur dioxide* by more than 99 %
- *nitrogen oxides* by around 30 %
- *carbon dioxide* by some 25 %

Participation *Joint Implementation*  
process under Kyoto Protocol  
only logical

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## ***Expectations Kaljasin City***



**Central Heating Station Kaljasin**

## **The Core: *Central boiler plant***

- modernisation
- conversion to natural gas
- cogeneration system retrofit

### **economic benefits**

- significant lighthouse effect  
entire region – particularly for  
commercial and industrial  
customers.

### **proving**

- natural gas conversions are not  
just environmentally friendly but  
also

### **extremely profitable**

- worthwhile copying.

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## ***Conclusions to principle***

Once connected to the NG grid, market penetration time essentially depends – apart of the lighthouse project success – on two factors:

- **scope and extent energy advice is provided to private, commercial and industrial customers (key industries) in the district**
- **tailor-made advice on efficient gas technologies and how to introduce natural gas into industrial processes.**



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## ***Conclusions to principle***

- start-up assistance **instead** of **subsidise**
- core for **self driving** renewal process
- **copyable** in many other regions of RF
- High **practice relevance**
- **Snowball effect** supported by Gazprom's gasification program
- **Attracting investors** / Funds by producing trust in Energy investments
- Being **fully on track** with international activities

***Business Plan Master = key to copy***

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## **Saving Environment**

...



**... needs  
interfuel  
substitution !**