



# Investigating the barriers of sustainability transitions: example of Russian oil and gas sector

Anton Khoroshavin,  
lecturer of Institute of the Earth Science of SPbSU



# Sustainable development indicators research for oil and gas companies

The Research of SD data reports of companies for a five-year period (from 2010 to 2015) was conducted for **3 largest Russian companies (PJSC Gazprom, PJSC NK Rosneft and PJSC Lukoil)**, as well as **3 foreign companies** for comparisons in the two groups indicated, based on the data on sustainability reporting for 2010-2015 [biggest by capitalization based on TOP 2000 Forbes list of 2015].

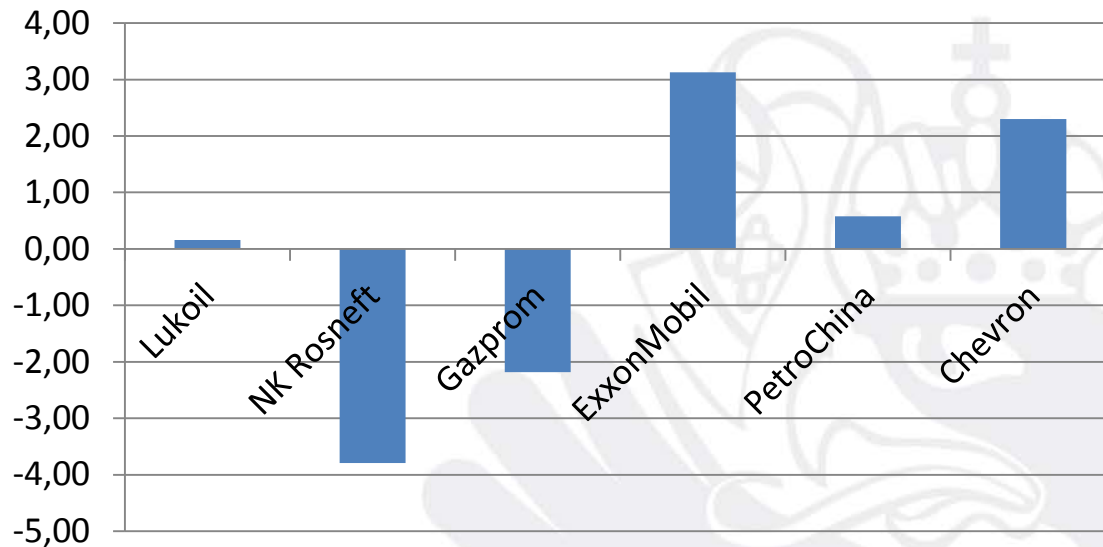
As a result of the calculations performed by the author and generalization of their results (see Figures below), the following conclusions were drawn describing the situation of Russian companies in the context of Sustainability transitions in comparison with foreign competitors.

Thus, the sample used is homogeneous from the point of view of the industry sector, the country where the activity is carried out and the companies' declared interest in business SD, which ensures the demonstration of the results. At the same time, it is not homogeneous, for example, from the point of view of production volumes, owners (the presence of the state among the beneficiaries) of the company, which additionally allows us to affirm the applicability of the developed approaches for various enterprises of the entire oil and gas sector.





# Proven reserves of hydrocarbons



This indicator of the dynamics of proved reserves indirectly demonstrates the efficiency of the company's work on the reproduction of its resource base with extreme events, including at the expense of technologies that increase the efficiency of development oilfield

## Dynamics of the supply of proven reserves of hydrocarbons (classified by the SEC) for 2010-2015 years

### Main causes:

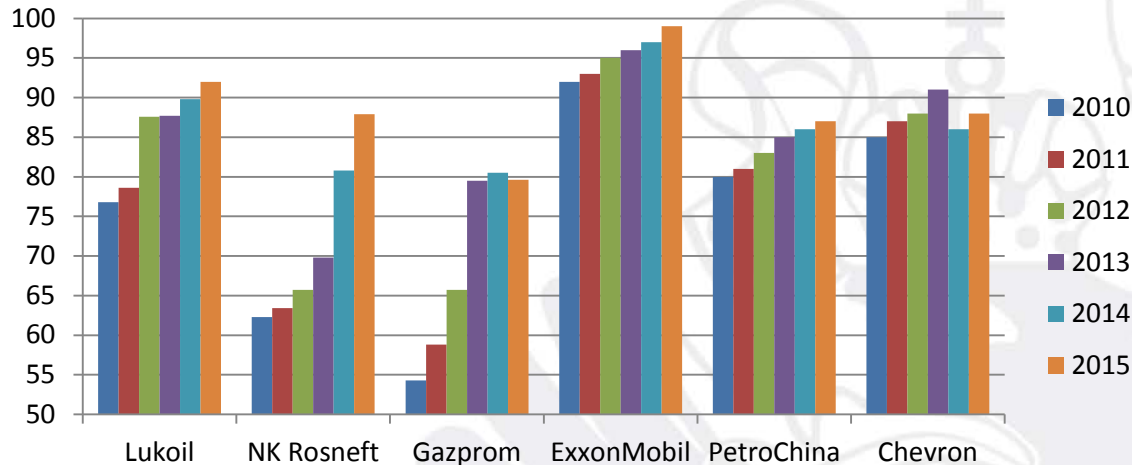
- insufficient volumes of geological exploration in the 90's
- increased exports of crude oil
- increased state participation as a shareholder, which stimulated the growth of crude oil production and exports to replenish the Russian budget.

### Last years Russian VIOC's improved their SD strategies:

- strengthening the exploration and development of new fields (including the Arctic region),
- R&D of new technologies for extracting difficult-to-extract reserves
- increasing the efficiency of developing existing fields



# Associated petroleum gas utilization



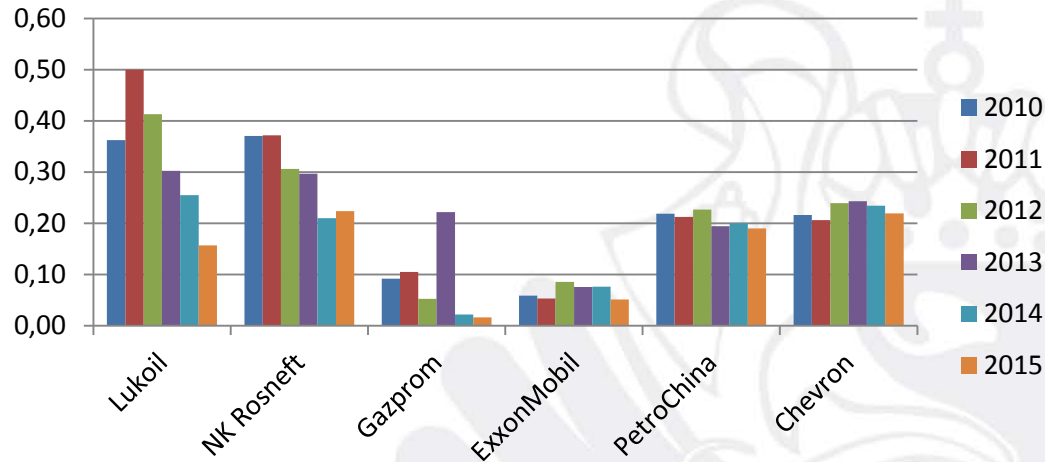
Share of associated petroleum gas utilization (%)

Based on the problem of irrational use of associated petroleum gas (its incineration in the Russian Federation and a number of other countries), which has a range of negative environmental impacts (primarily over limit emissions into the atmosphere, inefficient use of recoverable hydrocarbons, loss of energy resources)

The leader among Russian VIOCs is Lukoil Group, which reached the level of APG processing to 92% in 2015 (with the target set in the Russian legislation - 95%). Rosneft and Gazprom are lagging behind this indicator, but starting in 2012 (the government's introduction of a five-fold increase in the emission factor for pollutants from APG combustion) also began to show positive dynamics.



# Contaminated land to the production volume



One of the significant environmental impacts in the stages of oil production and transportation is land contamination in the event of emergency situations

Specific area of contaminated land to the volume of produced hydrocarbon raw materials (ha / million barrels AD).

Comparative analysis by years shows positive dynamics for this indicator for the last five years from Russian companies, which is a consequence of the introduction of a whole package of measures based on the results of investigations and analysis of the risks of accidents that occurred in previous years. As a result of risk analysis, domestic oil companies implement a whole range of measures, from the introduction of preventive failure measures to diagnostics and the improvement of planning preventive maintenance and replacement of pipelines to the formation of operational units involved in localization and liquidation of oil spills.



# Risk-oriented approach

Based on new ISO 14001:2015 Russian oil and gas companies determine the **risks and opportunities** that need to be addressed to:

- Environmental aspects
- Internal and external issues
- Requirements of interested parties



- give assurance that the EMS can achieve its intended outcome(s)
- prevent, or reduce, undesired effects, include external environmental conditions affecting to the organization

## CASE: biggest Russian oil company "Rosneft"

### Some identified sustainability risks in environmental component:

- **risks from the geographical and climatic conditions:** low winter temperatures, the ice conditions increase the risk of the safety of operations
- **risks from the gas realization:** PJSC "Gazprom" provides gas transportation in Russia - an increase of gas produced NC (APG utilization) - dependent on access to the facilities of the Unified Gas Supply System
- **risks of alternative energy development:** lack of development in the field of alternative energy projects may bear a financial loss (shift in demand) and a negative impact on the Company's reputation



	Strengths	Weak
Internal factors	<p>Economic aspects:</p> <ul style="list-style-type: none"> <li>• The largest taxpayers (+ tariffs)</li> <li>• Influence on industrial markets (pipe products, machinery and services)</li> </ul> <p>Environmental aspects:</p> <ul style="list-style-type: none"> <li>• Accumulated experience and knowledge about the causes of accidents and ways to prevent it</li> <li>• Used technologies for reclamation of contaminated land</li> </ul> <p>Social aspects:</p> <ul style="list-style-type: none"> <li>• large employer</li> <li>• city-forming enterprises</li> <li>• Charity</li> </ul>	<p>Economical aspects:</p> <ul style="list-style-type: none"> <li>• low “depth” of processing (oil refining and petrochemistry)</li> <li>• depreciation of infrastructure</li> <li>• low quality of main types of oil products</li> <li>• final stages of oil pad development</li> <li>• low share of raw materials goes for dependence on foreign technologies and equipment</li> </ul> <p>Environmental aspects:</p> <ul style="list-style-type: none"> <li>• discharges, leaks and accidents</li> <li>• emissions to the atmosphere</li> <li>• water abstraction for production</li> <li>• pollution with oil products</li> </ul> <p>Social aspects:</p> <ul style="list-style-type: none"> <li>• affect indigenous areas of the North</li> </ul>
External factors	<p><b>Opportunities</b></p> <p>Economical aspects:</p> <ul style="list-style-type: none"> <li>• relatively low costs due to currency exchange rate</li> <li>• MET tax exemptions for hard-to-recover reserves</li> </ul> <p>Environmental aspects:</p> <ul style="list-style-type: none"> <li>• undiscovered deposits</li> <li>• undeveloped areas for production location</li> </ul> <p>Social aspects:</p> <ul style="list-style-type: none"> <li>• availability of qualified personnel in the industry and specialized educational institutions</li> <li>• inflow of skilled migrants from neighboring regions</li> </ul>	<p><b>Threats</b></p> <p>Economical aspects:</p> <ul style="list-style-type: none"> <li>• the price of oil and petroleum products</li> <li>• the growth rate of the world economy</li> <li>• the demand for Russian oil brands</li> <li>• the degree of state regulation of the oil and gas industry</li> <li>• undeveloped oil transport system (to the East)</li> </ul> <p>Environmental aspects:</p> <ul style="list-style-type: none"> <li>• complicated oil production conditions</li> <li>• global warming and alternative energy technologies</li> <li>• undeveloped market for environmental services</li> <li>• frequent changes in environmental legislation</li> </ul> <p>Social:</p> <ul style="list-style-type: none"> <li>• remoteness regions with labor resources from the extraction sites</li> <li>• undeveloped social infrastructure in the oil regions.</li> </ul>

**Table 2.1 Key external and internal factors of Russian oil and gas companies as a base of sustainable development strategy (author's development)**



Санкт-Петербургский  
государственный  
университет  
www.spbu.ru

# THANK YOU FOR YOUR ATTENTION



*Anton Khoroshavin*  
*a.horoshavin@spbu.ru*





# Sustainability transitions in oil and gas companies

As a base of sustainability transitions in order to maintain a competitive and image benefits oil and gas companies should implement:

- **strategic approach** to eco-management (important due to the duration of the investment and production cycles and significance sunk cost).
- accounting **risk parameters** which are associated with the production (including environmental), marketing, finance, and others the activities of companies.

## CASE: the largest company in the sector - **Saudi Aramco**:

### The context of the organization:

- limited growth opportunities for companies in the mining sector
- own big business value can prevent achieve successful financial results.

### Competitive strategy of sustainable development:

- creating **integrated energy and chemical companies** throughout the value chain on the basis of hydrocarbons
- **leadership** in the development of **alternative technologies** and **innovations**.



أرامكو السعودية  
Saudi Aramco



# Life cycle perspective

ISO 14001:2015 control the stages of product lifecycle by:

- Establishing environmental requirements for:
  - **product design & development**, addressing each stage of product or service lifecycle
  - **procured products/services**
- Communicating environmental requirements to external providers
- Providing **information on environmental impacts associated with transport/delivery, use, end-of-life treatment**, final disposal of products/services.

п.8.1 ISO 14001:2015



Potential issues in lifecycle control requirements implementation in Russia:

- **undeveloped market for eco-services** (e.g. lack of qualified contractors for waste recycling),
- **deterioration of eco-infrastructure** (e.g. ineffective waste water treatment in many RF regions)
- **GAP's in environmental legislation** (e.g. a moratorium on payments for the final disposal of products, required by law Ф3 N 458 от 29.12.2014)