

## Risks, Strengths and Weaknesses of Russian Oil and Gas

This publication can be downloaded from: <http://www.arewcon.fi/publications.html>

Hannu Arkonsuo  
Arewcon-Development Oy  
[www.arewcon.fi](http://www.arewcon.fi)  
[hannu.arkonsuo@arewcon.fi](mailto:hannu.arkonsuo@arewcon.fi)

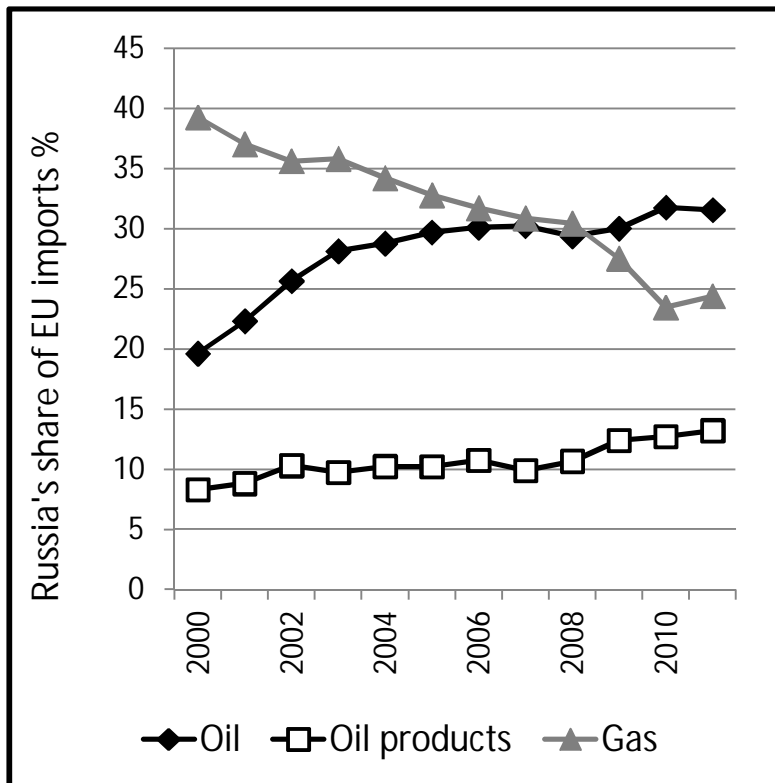
# Background and motivation

- ❑ This presentation is based on the study “Risks, strengths and weaknesses of Russian Oil and Gas” (An improved and updated version of my Licentiate Thesis at Helsinki University of Technology in 2009).
- ❑ The EU imports over 60% of its gas and over 80% of its oil facing growing competition for fossil fuel resources.
- ❑ Russia is an important but controversial source of energy supplies for Europe (following figure).
- ❑ Russia’s oil and gas sectors are important drivers of Russia’s economy (following figure).
- ❑ Europe has certain alternatives to Russia in energy imports and Russia has certain alternatives to Europe in energy exports.
- ❑ The purpose of this study is to construct a model for assessing energy suppliers and asses with this model Russia and other strategic oil and gas suppliers.
- ❑ The target audience of this study is companies, research institutes and other organizations and persons interested in energy and Russia.

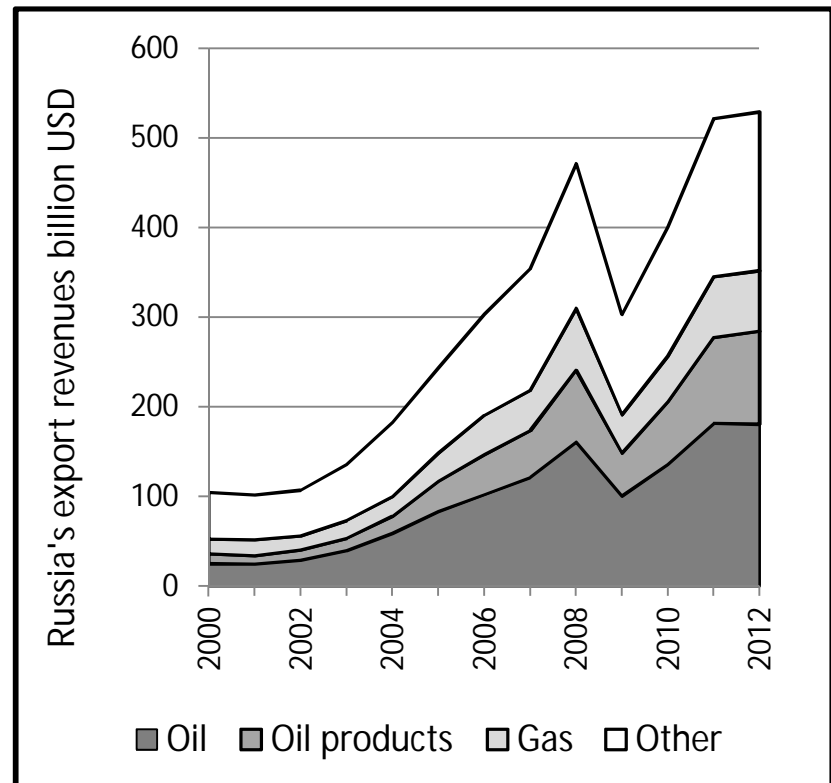
# Background and motivation

Example of the energy relations between the EU and Russia

Russia's share of EU 27 total oil and gas imports (Eurostat 2013)



Russia's export revenues (Bank of Russia 2013)



# Contents

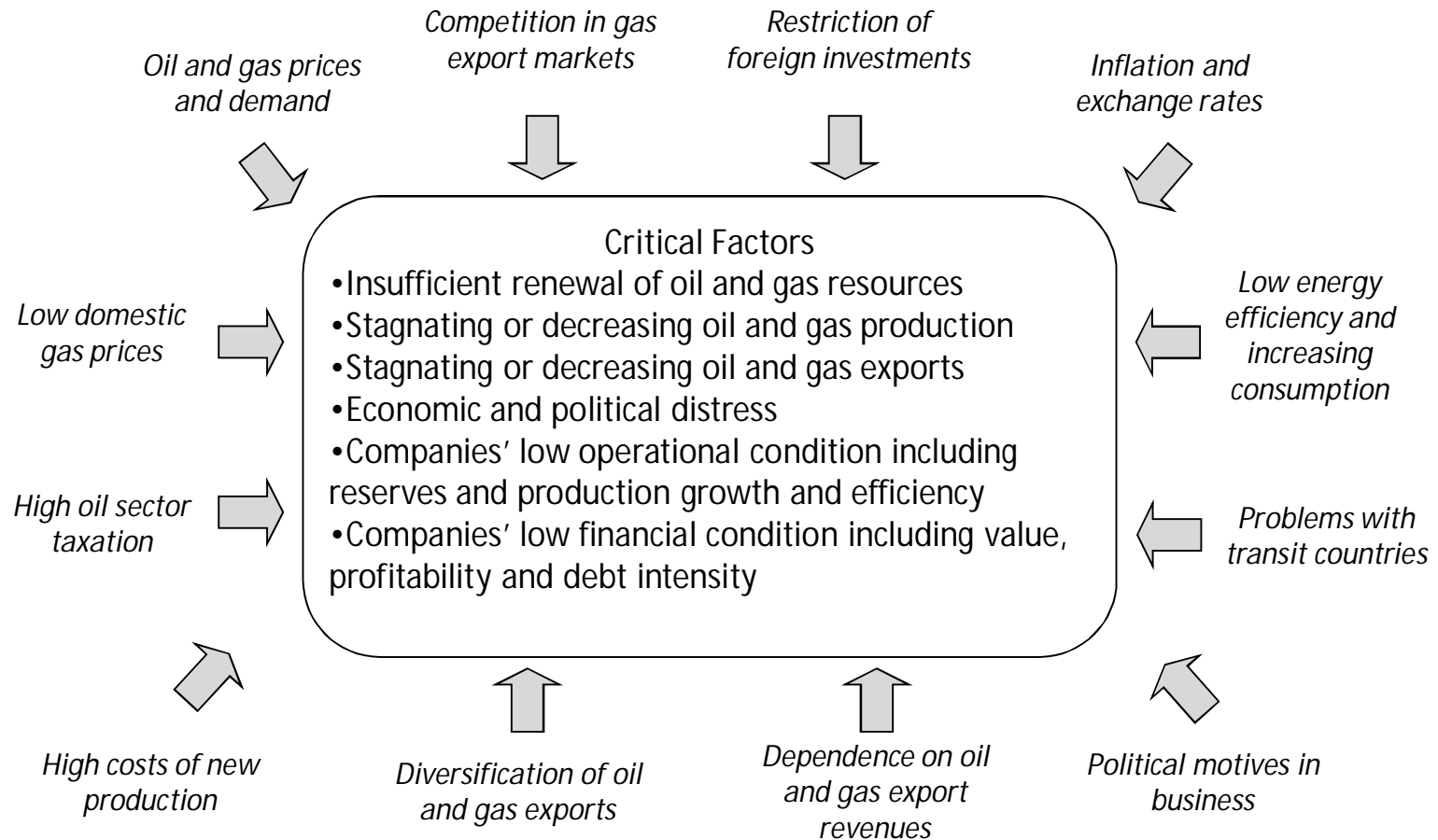
- ❑ Risk analysis and problem formulation
- ❑ Oil and gas data and its problems
- ❑ Value tree analysis
- ❑ Key results
- ❑ Key risks (background factors) to watch
- ❑ Risks, strengths and weaknesses
- ❑ Discussion and conclusions
- ❑ Thank You

# Risk analysis

- ❑ First the risks to which Russia's oil and gas sectors and their deliveries to Europe are exposed are identified.
- ❑ Risk includes a source of risk, scenario and consequence.
- ❑ The identification is based on western and Russian research and monitoring reports and the reports of leading Russian and western oil and gas companies.
- ❑ Risks are classified into seven main categories:
  - Market risks (e.g. oil and gas prices, competition)
  - Macroeconomic risks (e.g. ruble inflation and exchange rates)
  - Regulatory risks (e.g. taxation and price regulation)
  - Geological risks (e.g. depletion of resources and more complex new resources)
  - Political risks (e.g. conflicts with transit countries)
  - Environmental and technical risks (e.g. poor condition of infrastructure and low energy efficiency)
  - Industry specific risks (e.g. low investments and their consequences)

# Risk analysis

Sources of risks, scenarios and consequences, i.e., dangerous scenarios and critical factors



# Problem formulation

Critical factors are the starting point of problem formulation.

To enhance objectivity, the following research approaches are chosen:

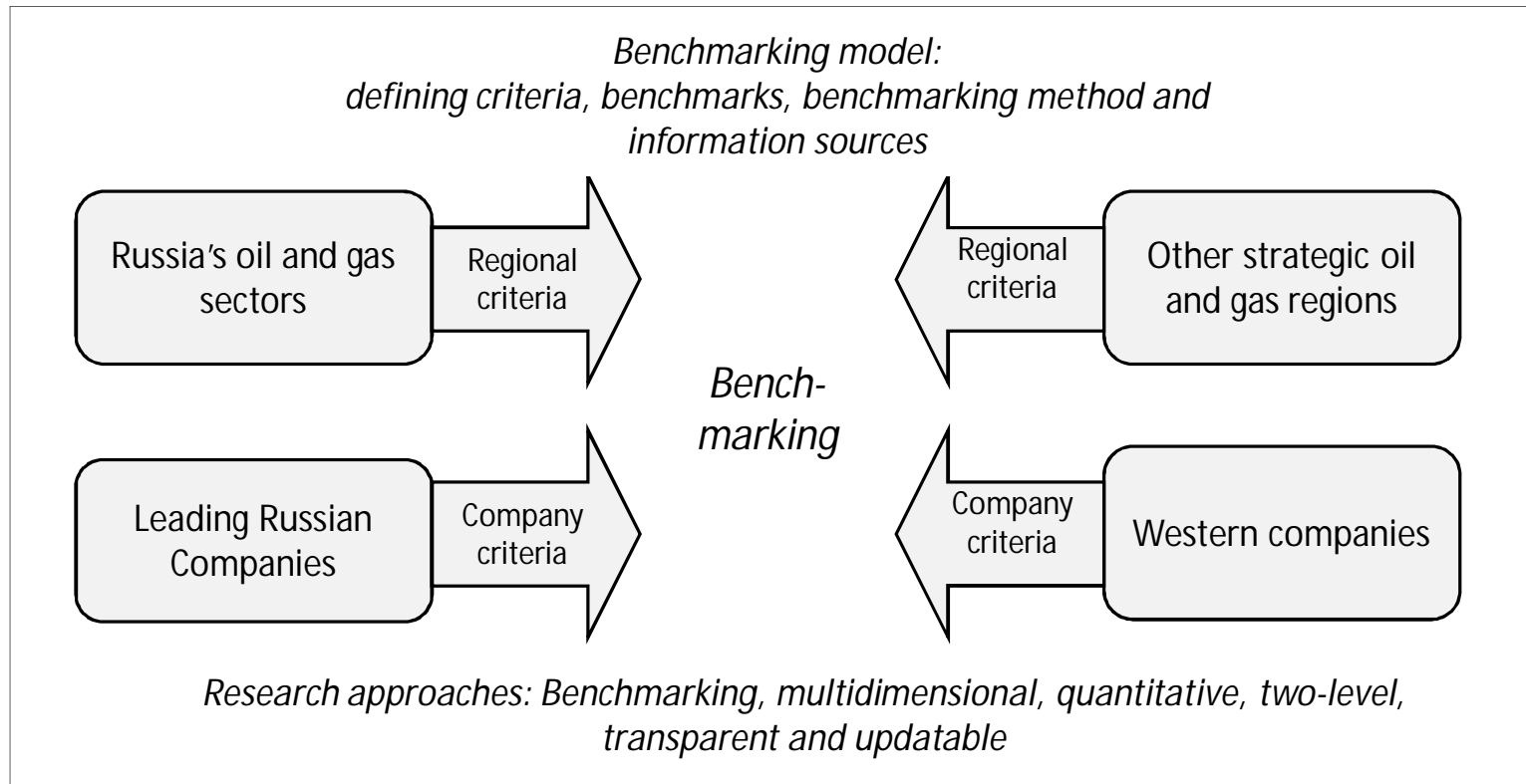
- Analysis uses benchmarking
- Analysis is multidimensional
- Analysis is quantitative
- Analysis is made both at regional and company level
- Analysis uses reliable, updatable and publicly available data sources

*Objectives of the study:*

- ❑ *The first objective is to construct a benchmarking model that takes into account the critical factors, results of relevant research, industry practices and availability of relevant data.*
- ❑ *The second objective is to benchmark Russia's oil and gas sectors against the other strategic oil and gas regions of the world.*
- ❑ *The third objective is to benchmark leading Russian oil and gas companies against leading oil and gas companies from other countries.*

# Schematic presentation of problem formulation

- *Task1: Find valid criteria, methods, benchmarks and information sources*
- *Task2: Make the analysis both at the regional and company level*
- *Task3: Evaluate how different risks and scenarios have affected Russian oil and gas*





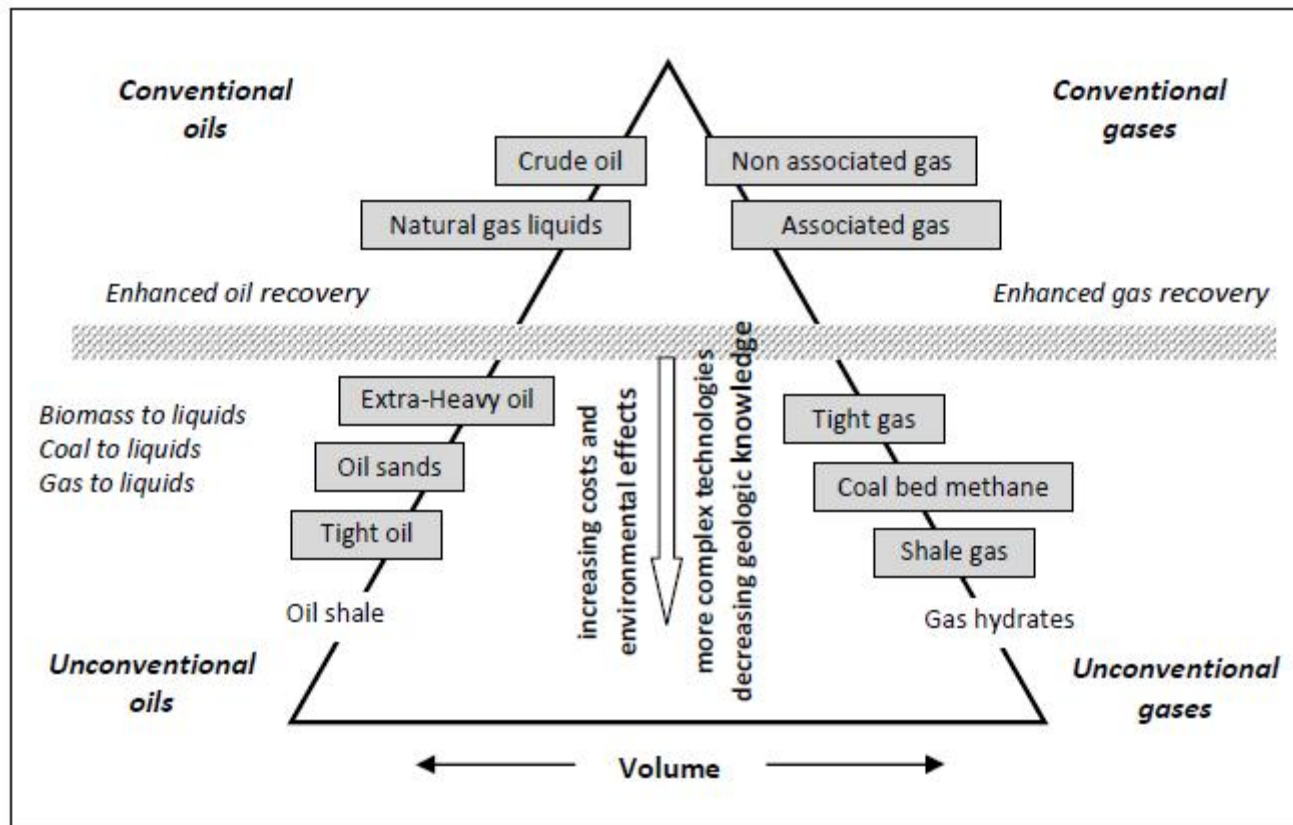
# Contents

- Risk analysis and problem formulation
- Oil and gas data and its problems
- Value tree analysis
- Key results
- Key risks (background factors) to watch
- Risks, strengths and weaknesses
- Discussion and conclusions
- Thank You

# Oil and gas data and its problems

## Problems of oil and gas data affecting the analysis

- Several different types of oils and gases which have different properties, geology and economics



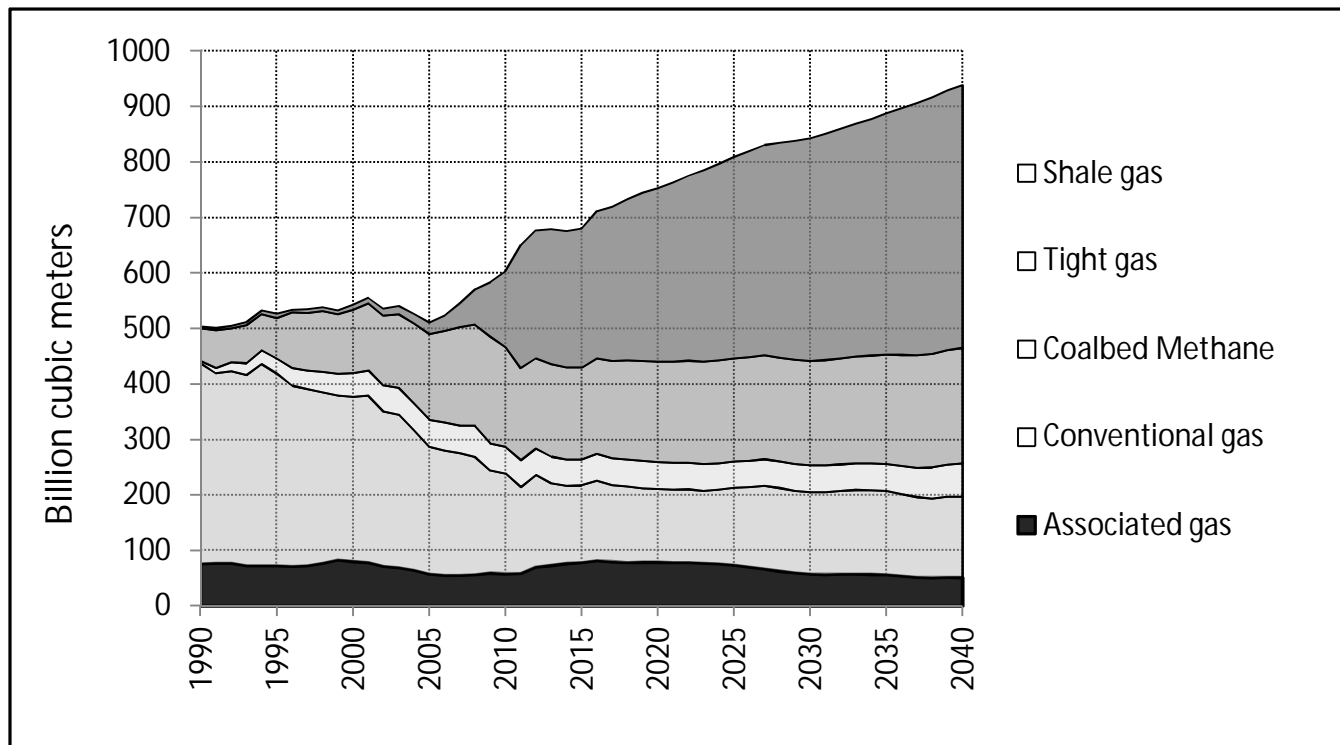
# Oil and gas data and its problems

- ❑ Several different resources classification systems which differ from each other such as
  - PRMS (Petroleum Resources Management System)
  - SEC (US Securities and Exchange Commission)
  - USGS (U.S. Geological Survey)
  - Russian system
  - And several other systems
- ❑ Differences in terminology, definitions, assessment and measuring methods
- ❑ Companies use of different accounting standards
  - Western and Russian companies U.S. GAAP or IFRS
  - Many Middle Eastern, African and Central Asian companies do not disclose comparable financial or operational information

# Oil and gas data and its problems

- ❑ Evolution of gas markets due to the USA's success in shale gas production and increased worldwide LNG trade

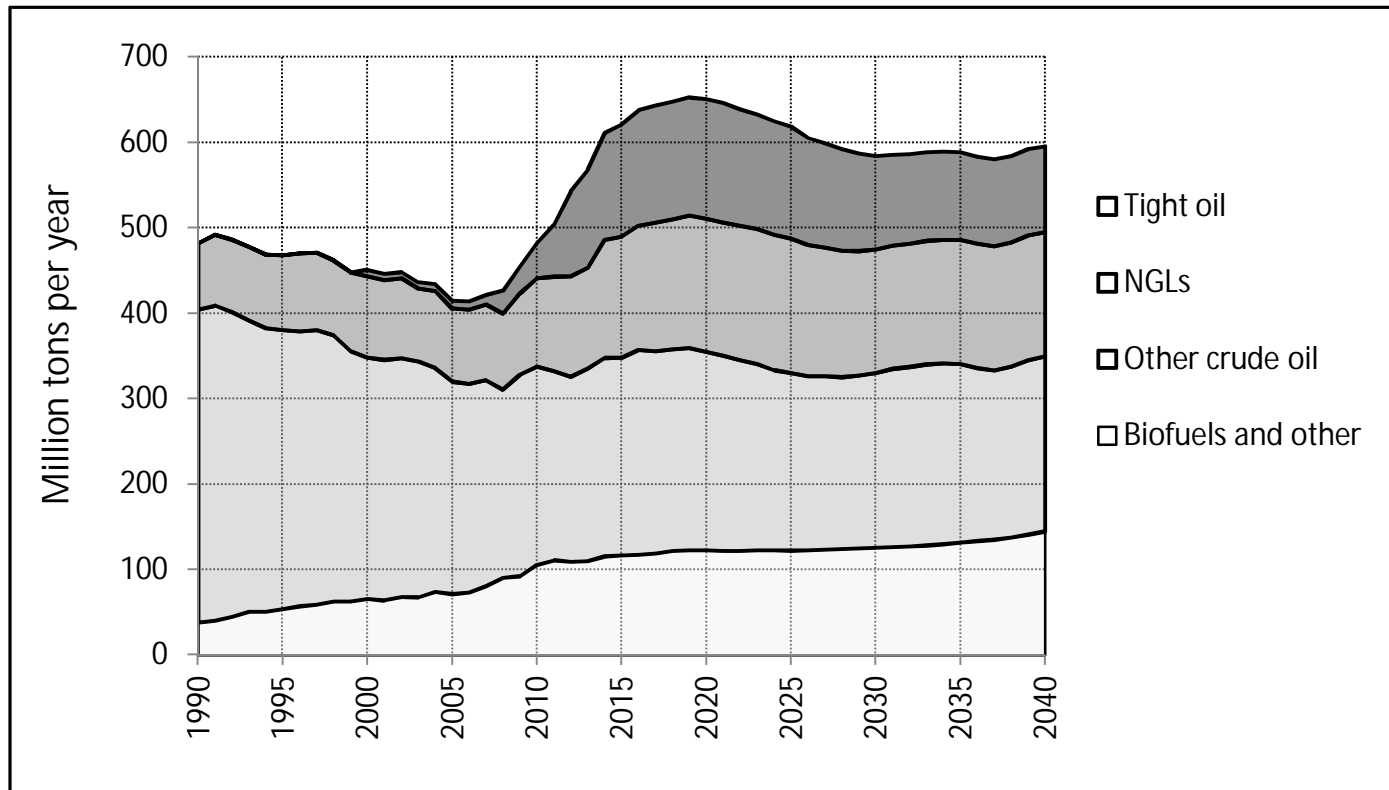
The figure below: USA's gas production history and future projections (source EIA)



# Oil and gas data and its problems

## ❑ Evolution of oil markets due to the USA's success in tight oil production

The figure below: USA's oil production history and projections (source EIA)

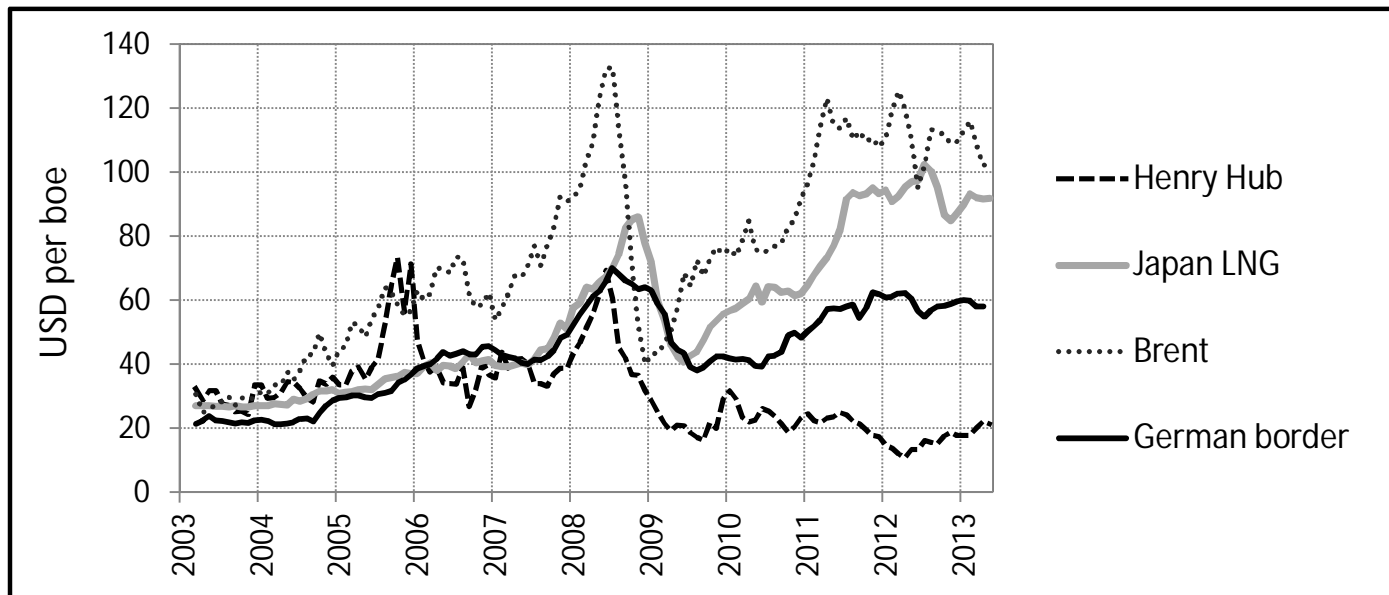


# Oil and gas data and its problems

- ❑ Many energy market experts expect that increasing unconventional oil and gas production in North America and elsewhere will increase competition, bring down oil and gas prices and limit the market power of big oil and gas exporters such as Russia , Saudi Arabia and Venezuela
- ❑ Although the development of shale gas and tight oil production in the USA has been convincing, the sustained growth of shale gas and/or tight oil production is not a certainty. For example, following counter arguments have been presented against the shale gas and oil revolution and overly optimistic expectations.
  - The economically recoverable quantities of shale gas and tight oil are uncertain
  - Most of current production is confined to deposits that have highest known production rates and costs are bound to rise in more problematic areas
  - The estimates of shale gas and oil finding, development and production costs vary considerably and are often difficult to interpret
  - The gas production growth in the USA is in part a result of high oil prices which improve the economics of gas deposits which have high concentration of liquids

# Oil and gas data and its problems

- ❑ Although oil is a global commodity, the volatility of oil prices is high and the predictability of oil prices is low. The long run marginal cost of oil is well below the market price of oil generating significant economic rents to governments and companies
- ❑ Although shale gas production and LNG trade have increased, gas prices have diverged rather than converged and the predictability of gas prices is low. The figure below presents oil price (Brent) and gas prices in different parts of the world



# Contents

- Risk analysis and problem formulation
- Oil and gas data and its problems
- Value tree analysis**
- Key results
- Key risks (background factors) to watch
- Risks, strengths and weaknesses
- Discussion and conclusions
- Thank You



# Value Tree Analysis

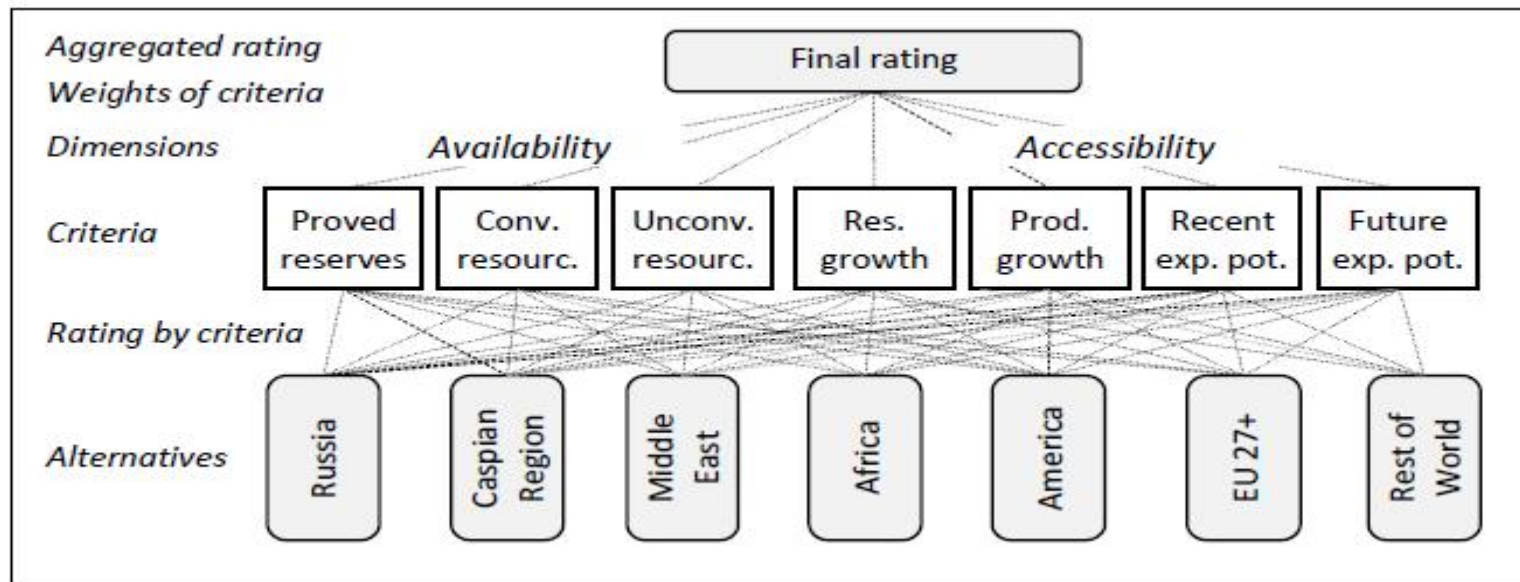
This study uses benchmarking and a good benchmarking model shall fulfill following requirements:

- It must objectively and transparently evaluate all alternatives
- It must enable comparisons between different alternatives and criteria
- It must enable the combining of results from different assessment dimensions
- It must be easy to understand and use

In this study the benchmarking method is based on value tree analysis

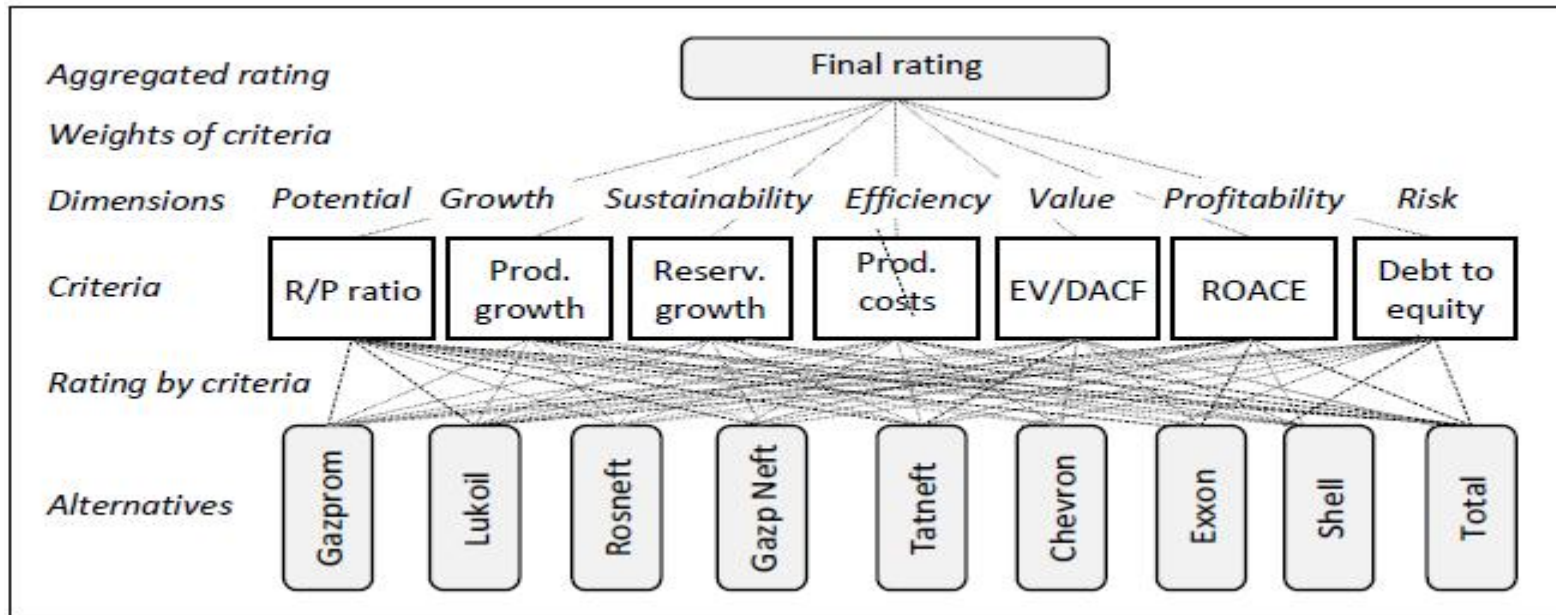
- Value Tree Analysis is typically used in analyzing several alternatives under different criteria
- An analyst or decision maker (DM) ranks alternatives based on the quantitative assessment of DM's preferences under each criterion and between different criteria

# Regional Value Tree



- ❑ Resources are sub-commercial or undiscovered, reserves are commercial, export potential is the difference between production and consumption, production and reserves growth is the growth during the assessment period 2003-2012. Future export potential in 2030 is based on scenarios.
- ❑ Caspian Region: Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan. EU27+ is EU27 plus Norway.
- ❑ Oil and gas sectors are analyzed separately using an equivalent unit: ton of oil equivalent (toe).
- ❑ First alternatives are ranked under each criterion using the criterion value function. Criterion scores are combined using the aggregated value function.
- ❑ The criteria are based on the critical factors and the recommendations of relevant research.
- ❑ The EU 27 dependence on and the political stability of the strategic regions are assessed separately.

# Company Value Tree



- ❑ R/P (reserves to production) ratio measures the relative quantity of reserves, production and reserves growth is the growth during the assessment period 2007-2012, production costs are the unit costs of production (USD/boe), enterprise value to debt adjusted cash flow (EV/DACF) measures the relative value of a company, return on average capital employed (ROACE) measures profitability, debt to equity (D/E) measures indebtedness and risk.
- ❑ The criteria are based on the critical factors and the recommendations of relevant research.
- ❑ Companies are assessed as a whole including oil, gas and other activities.
- ❑ First alternatives are ranked under each criterion using the criterion value function. Criterion scores are combined using the aggregated value function.

# Value functions

- Criterion value function (1) describes the performance level of each alternative under each criterion.

$$(1) \quad v_i(x_j) = 100 \cdot \frac{x_j}{x_j^*} \quad \text{where } x_j^* = \max x_j$$

The term  $x_j$  is the observed value of criterion  $i$  associated with the alternative  $j$  and  $x_j^*$  is the largest observed value of criterion  $i$  among all alternatives  $j$ . Thus the best alternative gets a score of exactly 100 and other alternatives get lower scores.

- Aggregated value function (2) combines the criterion scores of each alternative.

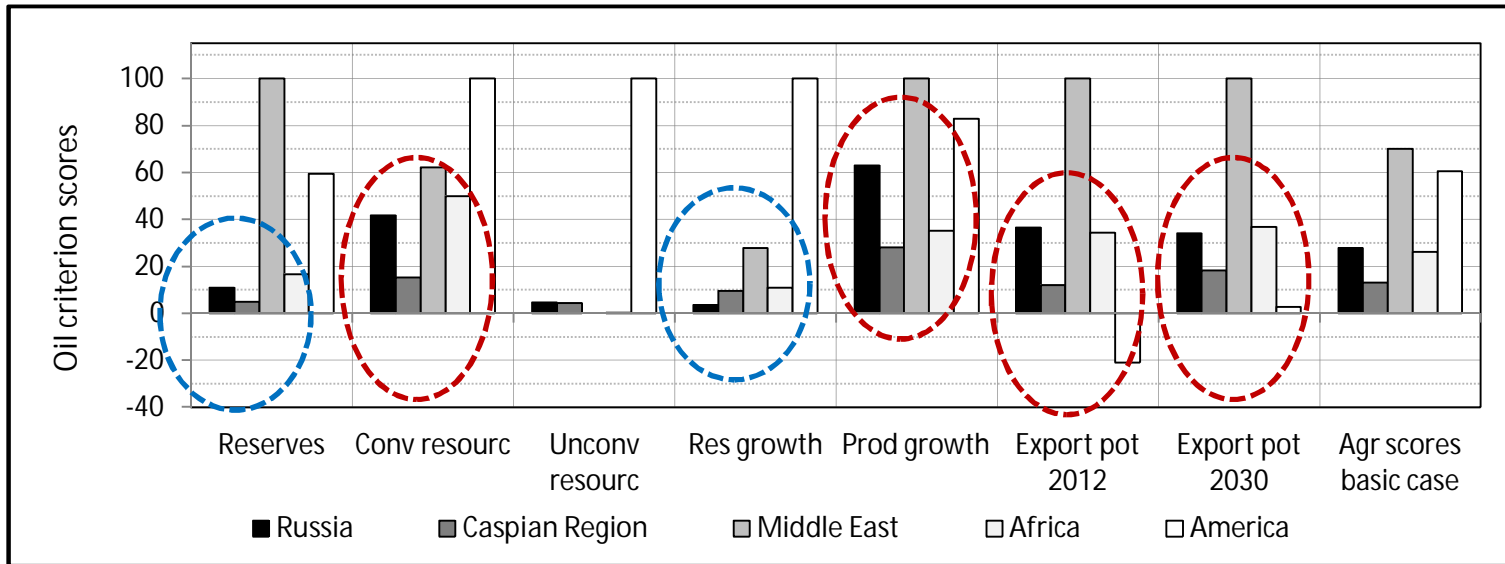
$$(2) \quad V_j(X) = \sum_{i=1}^N \mu_i v_i(x_i) \quad \text{where } \mu_i = \frac{1}{N}$$

$N$  is the number of the criteria and the criterion weights  $\mu_i$  reflect the psychological importance of the criteria and are the same for all the criteria. In sensitivity analysis different criterion weights are used based on the different reliability and importance of the criteria.

# Contents

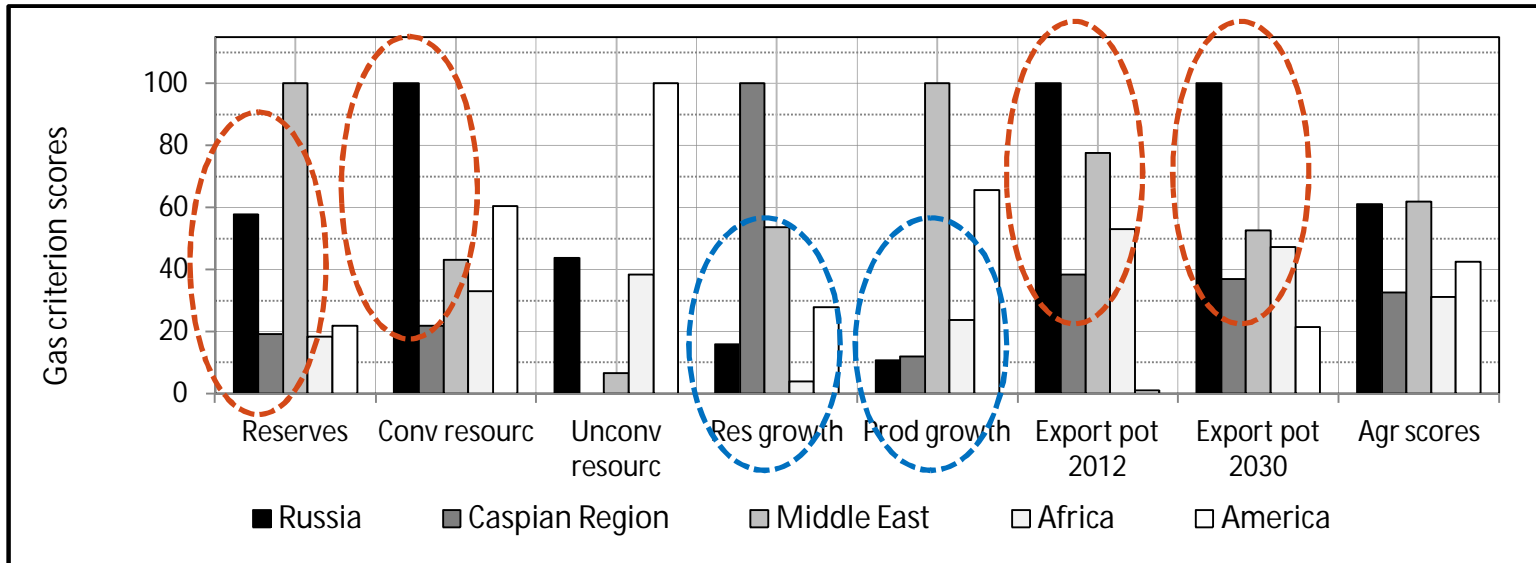
- Risk analysis and problem formulation
- Oil and gas data and its problems
- Value tree analysis
- Key results**
- Key risks (background factors) to watch
- Risks, strengths and weaknesses
- Discussion and conclusions
- Thank You

# Key results, regional oil performance profiles



- ❑ Performance profile includes an alternative's criterion scores and aggregated score. Criterion scores linearly reflect the actual values of criteria. The best alternative gets a score of exactly 100. Aggregated score is the weighted average of the criterion scores.
- ❑ Compared to other alternatives and criteria, Russia's weaknesses are reserves quantity and reserves growth (blue circles).
- ❑ Compared to other alternatives and criteria, Russia's strengths are conventional resources, production growth and export potential in 2012 and 2030.
- ❑ Unconventional resources are not regarded as a weakness or strength because information is insufficient and new data may change the situation.

# Key results, regional gas performance profiles



- ❑ Performance profile includes an alternatives criterion scores and aggregated score. Criterion scores linearly reflect the actual values of criteria. The best alternative gets a score of exactly 100. Aggregated score is the weighted average of the criterion scores.
- ❑ Compared to other alternatives and criteria, Russia's weaknesses are reserves growth and production growth (blue circles).
- ❑ Compared to other alternatives and criteria, Russia's strengths are reserves, conventional resources and export potential in 2012 and 2030 (red circles).
- ❑ Unconventional resources are not regarded as a weakness or strength because information is insufficient and new data may change the situation.

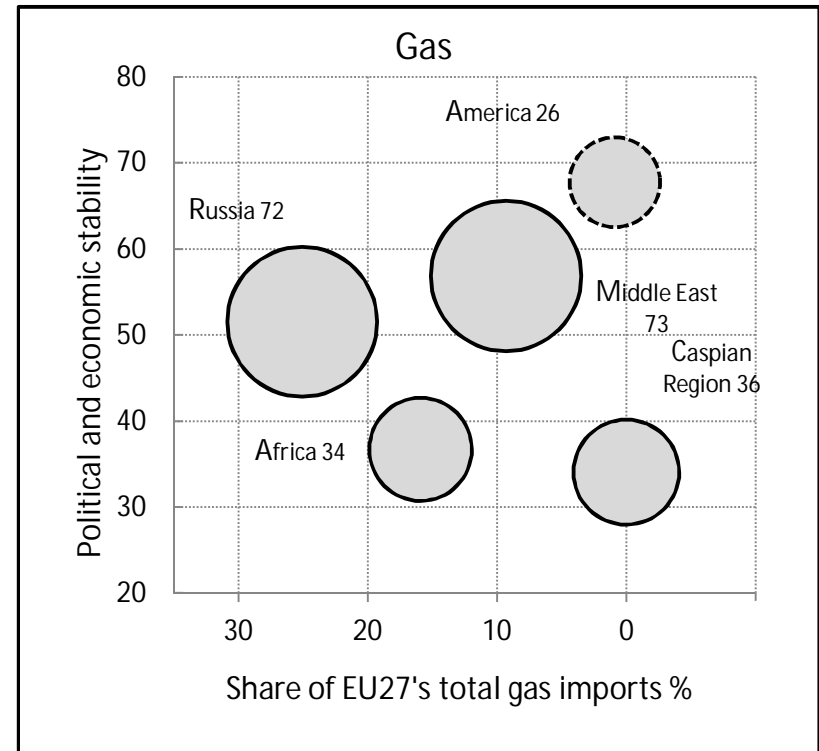
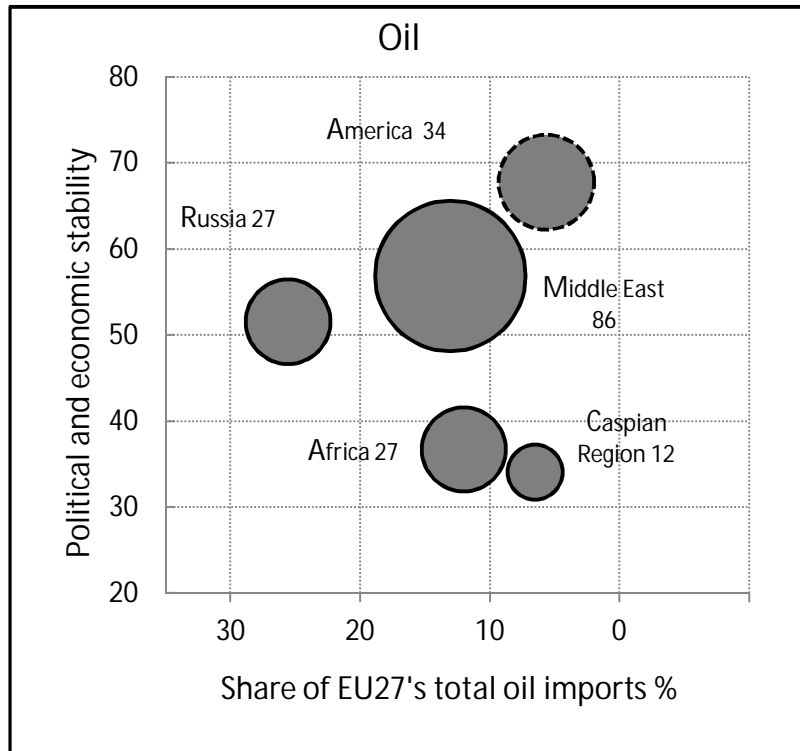
# Key results, final

The following figure present the aggregated scores, political and economic stability scores and the EU27's dependence on the imports from the regions.

*The number after the region's name is the region's aggregated score and the bubble areas are proportional to the aggregated score.*

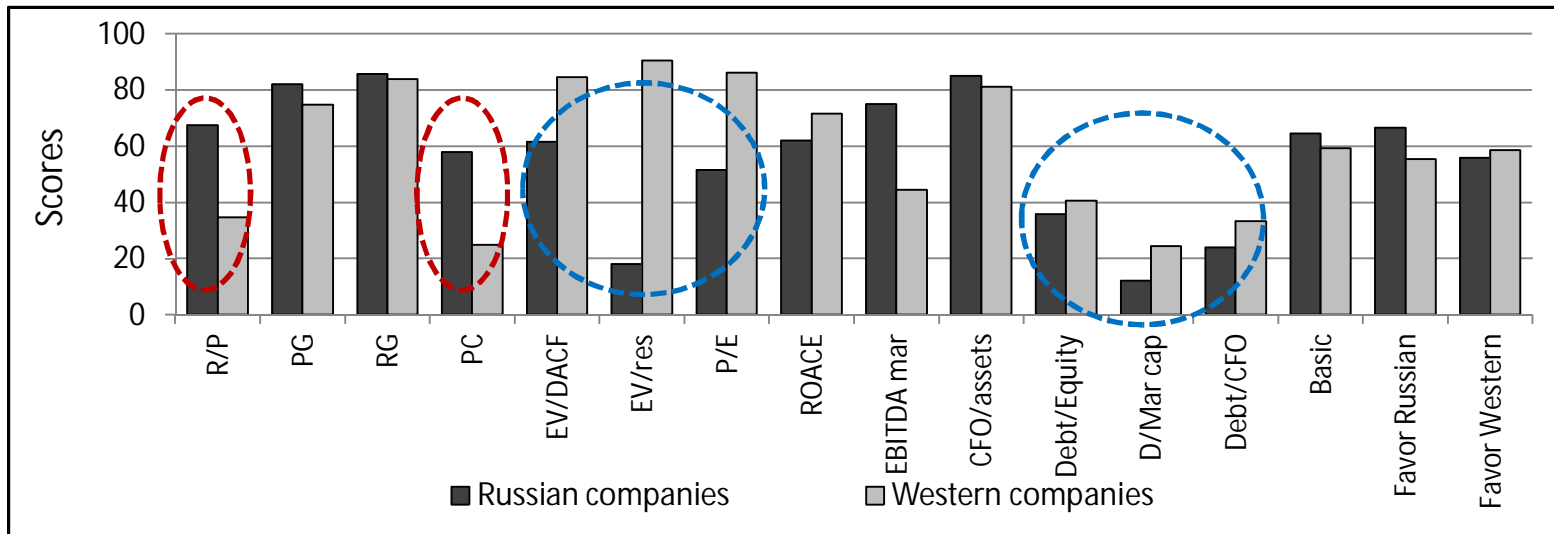
*The share of EU27's total imports is a region's share in percents. In principle smaller is better.*

*Political and economic stability is described by Euromoney country risk (ECR) with scale 0 – 100 where greater is better. Consequently, large bubble in North East is good.*





# Key results, average performance profiles of Russian and Western companies

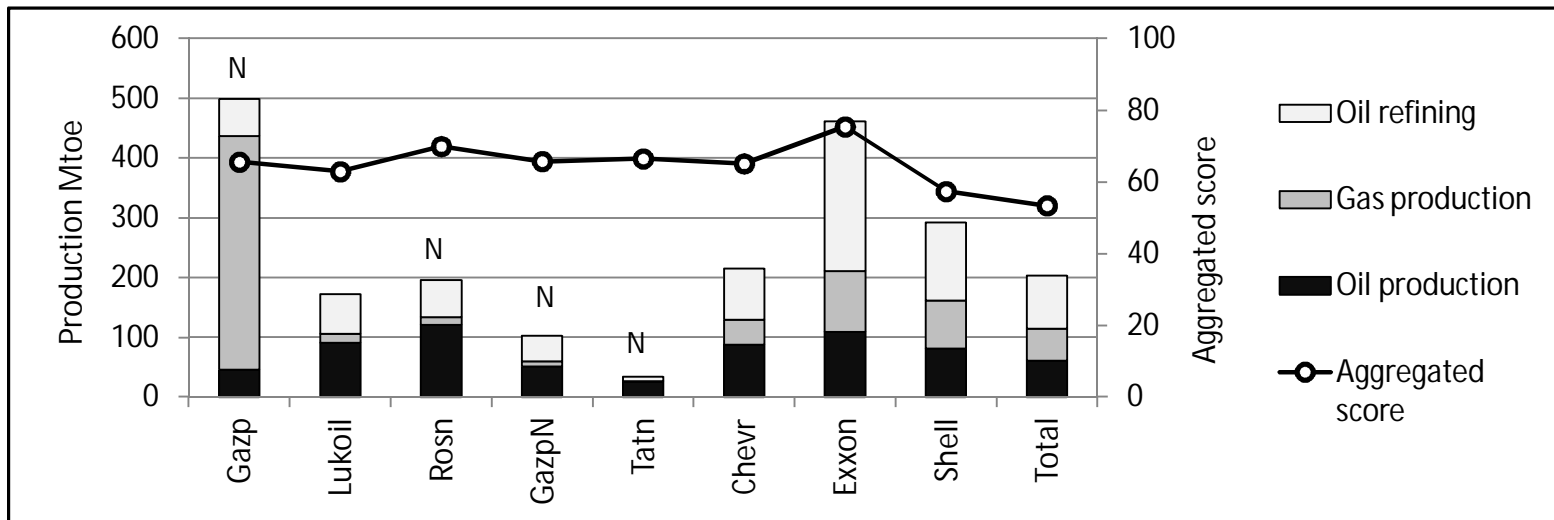


*R/P: reserves to production ratio; PG: production growth, RG: reserves growth; PC: production costs; relative company value is measured by EV/DACF or EV/reserves or P/E ratio; profitability is measured by ROACE or EBITDA margin or CFO to assets; debt intensity is measured by Debt to Equity or Debt to Market capitalization or Debt to Cash flow.*

- ❑ The strengths of Russian companies are large relative reserves (R/P) and low production costs (PC) (red).
- ❑ The weaknesses of Russian companies are low company's relative value (EV/DACF, EV/res, P/E) and high debt intensity (Debt/Equity, D/mar cap, Debt/CFO) (blue).
- ❑ Figure shows that using different criteria to measure the same dimensions gives different results. E.g. the combination EV/DACF, EBITDA margin and Debt to Equity favors Russian companies. Consequently, some interest groups can manipulate companies' observable performance by using suitable criteria.

# Key results, final, companies

The figure below presents the companies' aggregated scores and also reminds that the companies differ significantly from each other in size and production and ownership structure. N means a partly national company



Three important Russian companies: Surgutneftegaz, TNK-BP and Novatek are excluded from this analysis.

- ❑ Surgutneftegaz reports only restricted reserves information according to the Russian system and until 2012 made financial reports according Russian standards.
- ❑ Rosneft finished the acquisition of TNK-BP in 2013 and this reflected in TNK-BP's financial results in 2012.
- ❑ The values of Novatek's certain criteria are exceptionally good due to recent big acquisitions
- ❑ The Western oil major BP is excluded because 40% of its oil came from TNK-BP in 2012.
- ❑ Gazprom Neft's financial and operational information is partly included in Gazprom's information.

# Contents

- Risk analysis and problem formulation
- Oil and gas data and its problems
- Value tree analysis
- Key results
- Key risks (background factors) to watch
- Risks, strengths and weaknesses
- Discussion and conclusions
- Thank You

# Key risks (background factors) to watch

The risks presented in slide 6 are divided into controllable and uncontrollable risks. Controllable risks depend mainly on decisions made in Russia. Uncontrollable risks are mostly outside the control of Russian oil and gas companies and authorities.

## *Uncontrollable risks/indicators of risks to watch*

- ❑ Oil and gas prices and demand/oil prices and regional gas prices in different parts of the world.
- ❑ Competition in the European and other markets/Russia's market share in Europe; unconventional oil/gas production in North America, Europe, Ukraine and China.
- ❑ Growing capital intensity of new production/Russia's reserves and production growth
- ❑ Ruble inflation and exchange rate against the U.S. dollar /real appreciation (depreciation )of the ruble

## *Controllable risks/indicators of risks to watch*

- ❑ Domestic gas prices /development of gas prices
- ❑ Russia's oil and gas sector taxation/development of taxation
- ❑ Dependence of energy export revenues/share of oil and gas export revenues of total export revenues
- ❑ Russia's energy efficiency/development of energy efficiency
- ❑ State ownership/development of the state ownership in the leading oil and gas companies
- ❑ Problems with transit countries/development of the quantity of transit oil and gas
- ❑ Restriction of foreign investments/development of the share of foreign investments in companies
- ❑ Diversification of energy exports/the size and structure of Russia's energy export portfolio

# Contents

- Risk analysis and problem formulation
- Oil and gas data and its problems
- Value tree analysis
- Key results
- Key risks (background factors) to watch
- Risks, strengths and weaknesses
- Discussion and conclusions
- Thank You

# Risks, strengths and weaknesses

Controllable risks	Uncontrollable risks
<p><i>Russia and Russian companies</i></p> <ul style="list-style-type: none"> <li>▪ Oil sector taxation</li> <li>▪ Domestic gas prices</li> <li>▪ Dependence on energy export revenues</li> <li>▪ State ownership, political motives in business</li> <li>▪ Restriction of private and foreign investments</li> <li>▪ Problems with transit countries</li> <li>▪ Diversification of exports</li> <li>▪ Low energy efficiency and increasing consumption</li> </ul>	<p><i>Russia and Russian companies</i></p> <ul style="list-style-type: none"> <li>▪ International oil and gas prices and demand</li> <li>▪ Competition in the European and other gas markets</li> <li>▪ Ruble inflation and exchange rates</li> <li>▪ Growing capital intensity of new production</li> </ul>
<i>Strengths</i>	<i>Weaknesses</i>
<p><i>Russia</i></p> <ul style="list-style-type: none"> <li>▪ Conventional oil resources</li> <li>▪ Oil production growth</li> <li>▪ Oil export potential in 2012 and 2030</li> <li>▪ Gas reserves</li> <li>▪ Conventional gas resources</li> <li>▪ Gas export potential in 2012 and 2030</li> </ul> <p><i>Russian companies</i></p> <ul style="list-style-type: none"> <li>▪ Large reserves compared to production</li> <li>▪ Low production costs</li> </ul>	<p><i>Russia</i></p> <ul style="list-style-type: none"> <li>▪ Oil reserves</li> <li>▪ Oil reserves growth</li> <li>▪ Gas production growth</li> <li>▪ Gas reserves growth</li> </ul> <p><i>Russian companies</i></p> <ul style="list-style-type: none"> <li>▪ Low company's relative value</li> <li>▪ High debt intensity</li> </ul>

# Contents

- Risk analysis and problem formulation
- Oil and gas data and its problems
- Value tree analysis
- Key results
- Key risks (background factors) to watch
- Risks, strengths and weaknesses
- Discussion and conclusions
- Thank You

# Discussion and conclusions

- ❑ This benchmarking model uses value tree analysis and its key elements are: alternatives, criteria, criterion value functions, criterion weights and information sources. The quality of this analysis depends on the quality of the key elements.
- ❑ The choice of regional alternatives takes into account the EU's current and also possible future suppliers.
- ❑ In company analysis, it would be ideal to benchmark Russian companies against a few companies from each chosen region. The problem is that most national oil and gas companies in the Middle East, Africa and Caspian Region disclose only restricted financial and operational information.
- ❑ The choice of regional criteria is based on the critical factors and the factors affecting energy security.
- ❑ The choice of company criteria takes into account the critical factors, recommendations of many researchers and company practice.
- ❑ The criterion value function is based on the assumption that decision maker linearly values oil and gas quantities and operational and financial ratios. Also other value functions can be used if it can be justified.
- ❑ The aggregated score is the normalized weighted average of the criterion scores. The weighting is done with criterion weights which sum up to 1. The weights are based on literature and personal judgment.
- ❑ The regional primary data originates mostly from the reports and/or data bases of the BGR, BP Statistical Review of World Energy, the EIA, the IEA, OPEC, Eurostat, Bank of Russia and Rosstat. Although there are differences between the data from different organizations, there are only few, if any, publicly available alternatives to these data sources.
- ❑ The data for company analysis is mostly from the companies' reports. The problems are that some companies use US GAAP and other IFRS financial reporting and some companies report PRMS reserves and other report SEC reserves. It is impossible to precisely evaluate the effects of different financial or reserves reporting systems. It is suggested that a rule of thumb for the possible differences in both cases could be some 20%.



# Discussion and conclusions

- ❑ When the results of this study are interpreted, it should be remembered that besides the uncertainties of criterion values, there are also other possible sets of criteria and alternatives and other possible value functions which can give different results. Also, the chosen assessment period affects results.
- ❑ The value tree model is not bound to the criteria, value functions or alternatives used in this analysis. The limiting factors are an analyst's ability to choose proper elements of the model and the availability of relevant information irrespective of whether the question is of expert opinion or recorded data.
- ❑ This study shows that the value tree model suits well for the assessment of oil and gas regions, countries and companies. The assessment chain: information sources, criterion values and scores and performance profiles works well. Performance profiles clearly and unambiguously present the strengths and weaknesses of an alternative compared to the other alternatives and criteria and are not dependent on the different units of measurement. The aggregated scoring forces the user of the model to consider the relative importance of different criteria.
- ❑ This study also clearly shows that it is misleading to evaluate Russia's or some other region's or company's performance based only on a qualitative assessment or to benchmark them only against their own past performance or a single benchmark like the Middle East using only one or a few criteria.
- ❑ I think a critical reader should especially pay attention to the core themes of this study, i.e., the risks of Russia's energy supplies for Europe, choice of the criteria used for assessing oil and gas supplying regions, countries and companies, importance of different criteria and treatment of the uncertainties of source data and analysis results. I would be grateful for any questions, comments, proposals and criticism which help me to develop better methods for assessing energy suppliers. All feedback can be addressed to my email address: [hannu.arkonsuo@arewcon.fi](mailto:hannu.arkonsuo@arewcon.fi) .

# Russian oil and gas

Thank You!