A Changing Russia in the Changing Global Energy Landscape

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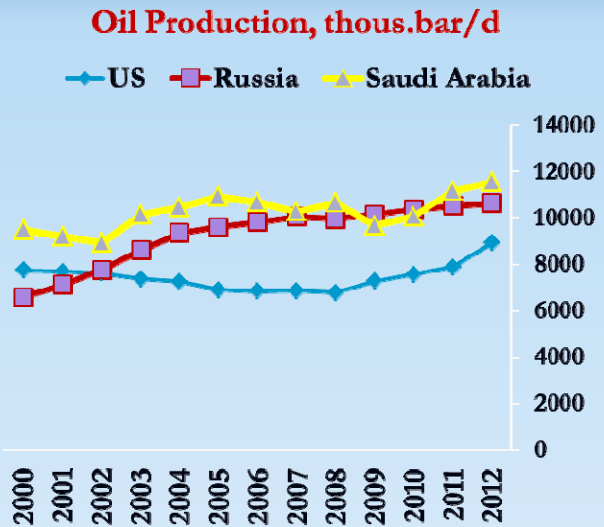
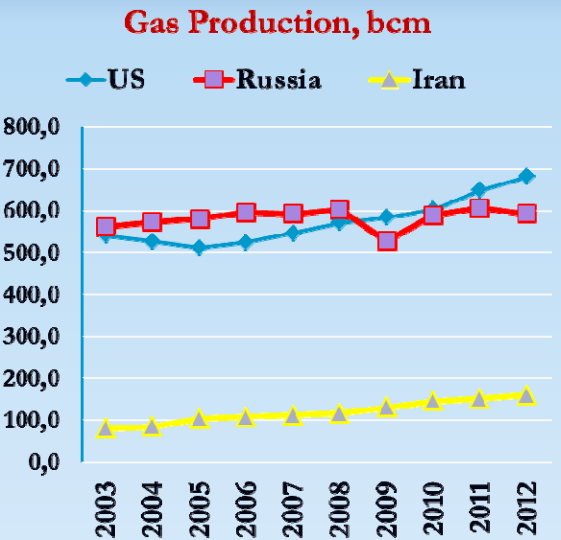
US: the New Global Energy Leader?





In 2013, US will overtake Russia and Saudi Arabia in liquids (crude oil + gas condensate + gas liquids + biofuel) production: preliminary estimates of 12.1 mln.bar./d

Key Global Energy Trends

- **Strong positions of OPEC**
  - Currently accounts for 40% of global oil production; will reach 46% by 2030. OPEC output to rise by 12 mb/day (BP forecast)
  - Middle East dominates in the future growth of oil and gas production
- **The growing role of national oil companies (NOCs) versus international oil companies (IOCs)**
  - NOCs control the bulk of the proved oil reserves (85% in 2010) and current production (58% in 2010) (EIA estimates)
- **Unconventional hydrocarbon resources on the rise (shale oil and gas, oil sands, deepwater)**
  - Growth leaders: US shale oil and gas, Canadian oil sands, Brazilian deepwater (subsalt layer), US and Brazilian biofuel
- **Decreasing energy consumption in OECD, increasing in the non-OECD world (primarily China, India and Middle East)**
- **Decline of oil refining in OECD countries, growth in the Middle East, India and China**
- **Development of the LNG market (Qatar, Australia)**
  - Global LNG supply to rise 4.5% p.a. to 2030 while gas production to rise by 2.1% p.a. (BP)
- **Focus on the renewables**
  - By 2030, renewables will supply 11% of world electricity and 7% of transport fuels (BP)
- **New levels of political instability: the Arab Spring**

Top Twenty Energy Companies, 2011

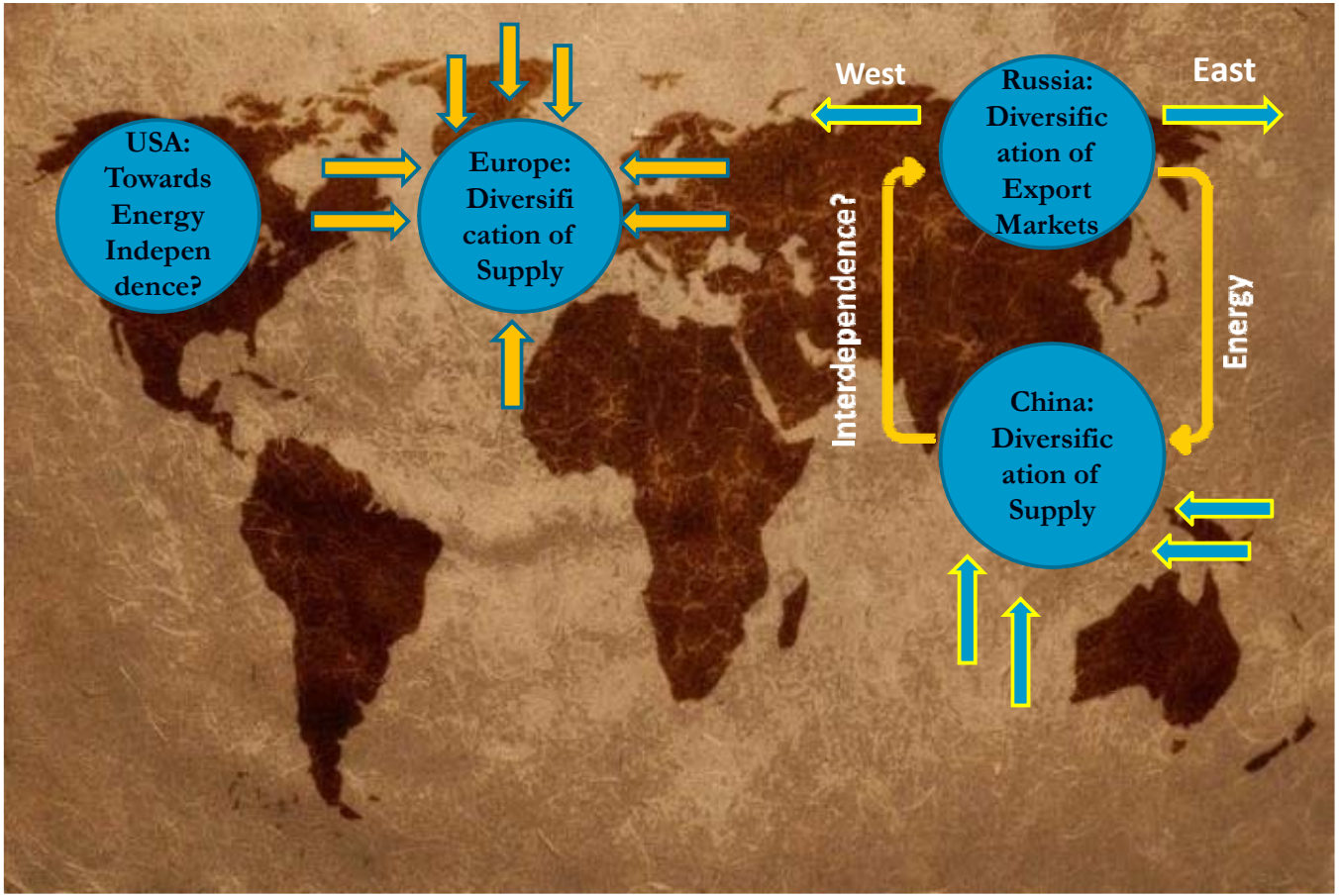
2011 Rank	2010 Rank	Company	Country	State Ownership (%)
1	1	Saudi Aramco	Saudi Arabia	100
2	2	NIOC	Iran	100
3	3	ExxonMobil	US	-
4	4	PDVSA	Venezuela	100
5	5	CNPC	China	100
6	6	BP	UK	-
7	7	Royal Dutch/Shell	Netherlands/UK	-
8	8	Chevron	US	-
9	10	Total	France	-
10	12	Gazprom	Russia	50.0023
11	11	Pemex	Mexico	100
12	8	ConocoPhillips	US	-
13	13	KPC	Kuwait	100
14	17	LUKOIL	Russia	-
15	15	Petrobras	Brazil	48
16	14	Sonatrach	Algeria	100
17	19	Adnoc	UAE	100
18	17	Petronas	Malaysia	100
19	16	Rosneft	Russia	75.16
20	21	QP	Qatar	100

Source: Petroleum Intelligence Weekly

Top Ten Hydrocarbon Producers in 2012

Country	Proved oil reserves, bln.bar	Country	Oil production, thous.bar/d	Country	Proved gas reserves, tcm	Country	Gas production, bcm/yr
Venezuela	297.6	Saudi Arabia	11530	Iran	33.6	US	681.4
Saudi Arabia	265.9	Russia	10643	Russia	32.9	Russia	592.3
Canada	173.9	US	8905	Qatar	25.1	Iran	160.5
Iran	157.0	China	4165	Turkmenistan	17.5	Qatar	157.0
Iraq	150.0	Canada	3741	US	8.5	Canada	156.5
Kuwait	101.5	Iran	3680	Saudi Arabia	8.2	Norway	114.7
UAE	97.8	UAE	3380	Venezuela	5.6	China	107.2
Russia	87.2	Kuwait	3127	Algeria	4.5	Saudi Arabia	102.8
Libya	48.0	Iraq	3115	Australia	3.8	Algeria	81.5
Nigeria	37.0	Mexico	2911	Iraq	3.6	Turkmenistan	64.4

Source: 2012 BP Statistical Review of World Energy


USA: Towards Energy Independence?
Europe: Diversification of Supply
West
East
Russia: Diversification of Export Markets
Interdependence?
Energy
China: Diversification of Supply

Russian Energy Realities

- Mature and relatively modest oil reserve base
- High rates of oil fields depletion (about 50% on average); high water cut (86% on average), growing share of hard-to-recover reserves and highly viscous oil
- Greenfields located in remote areas with harsh climate and complex geology
- Low reserve replacement ratio; no big fields left in undistributed fund; new discoveries are small fields; insufficient exploration efforts in greenfield areas
- Slowdown in oil production growth:
  - Decline in West Siberia, growth in East Siberia and the North
  - Small and mid-size fields are virtually ignored
- Situation with gas reserves is better than with oil reserves, but:
  - Three Soviet giants (Urengoi, Yamburg, and Medvezhiye fields) are declining
  - Growing share of complex and hard-to-recover reserves
  - New reserves lie deeper and further to the North
- Rising production costs
- Inefficient development of existing fields (design oil recovery ratio of 38%, actual oil recovery ratio of 20%)
- Losses and inefficiencies:
  - Associated gas flaring of about 35 bcm/yr (World Bank)

Hopes for the Future

- **Continental shelf**: initial total recoverable resources of 90.3 bln tons of oil equivalent (16.5 bln tons of oil and condensate and 73.8 tcm of gas)
- **However**: 96% of Russian oil reserves are located on-shore
- **Greenfields** on-shore (East Siberia, Far East, Timano-Pechora)
- **Brownfields**
  - 82.5% of current recoverable reserves are located at producing fields with established production and social infrastructure
    - Increasing the design oil recovery ratio from the current 38% to 42% will permit producing additional 30 mt/yr of oil
- **Small and mid-size fields**
  - Fields with reserves of less than 5 mln tons account for 5% of total initial recoverable reserves, and their share will grow in the future
- **Shale gas and oil** (Bazhenov formation – insufficiently explored, estimates of geological resources range from 60 mln to 30 bln tons)
- **Energy saving**
  - "The biggest gas fields in Russia are located in its major cities".

The Arctic: a New Petroleum Eldorado?

- The Arctic is to become the principle resource base of Russia in the XXI century?
  - Hydrocarbon production at the Russian Arctic shelf will grow significantly by 2030 reaching 66.2 mln tons of oil and 230 bcm of gas.

    Dmitriy Medvedev, Prime-Minister of Russia, Summer 2012
  - "Strategy for Developing the RF Arctic Zone and Ensuring National Security up to 2020", February 2012
- How big is the real Arctic resource potential?
- Will Russian Arctic hydrocarbons be competitive in the global energy market? At what level of world oil prices will production be feasible?
- Is Russia ready to develop its Arctic hydrocarbons:
  - Financially
  - Managerially
  - Organizationally
  - Sustainably
  - Technologically:
    - The Arctic is very diverse:
      - Ice-free areas: can be developed with existing technologies
      - Areas covered with ice part of the year: can be developed with incremental innovations
      - Areas covered with ice most of the year: can be developed with break-through innovations

Key Russian Energy Trends-1

- **Further consolidation of the energy sector**
  - Two national champions:
    - Gazprom, the ailing gas giant
      - Growing competition in the gas sector (Rosneft, NOVATEK)
    - Rosneft, the rising energy giant
      - Deal of the century – acquisition of TNK-BP.
      - World's biggest public oil company (Reserves of 3,957 bln tons of oil equivalent, production of 235 mln tons oil equivalent/yr)
      - What are the longer-term implications?
- **Privatization or nationalization of the sector?**
  - Acquisition of TNK-BP

  But:
  - BP is now the second biggest shareholder of Rosneft (19.75%) after the Russian state
  - Plans to continue privatization of Rosneft
- **Internationalization of Russian oil and gas companies**
  - Rosneft, LUKOIL, Gazprom
- **Developing partnerships with IOCs**
  - Rosneft + ExxonMobil, ENI, Statoil
- **Gradual liberalization of LNG exports :**
  - winners: Rosneft and NOVATEK

Key Russian Energy Trends-2

- **Facing West and East: Energy Interdependence with China?**
  - Gas negotiations with China are still underway
  - Oil cooperation is expanding
    - East Siberia – Pacific Ocean pipeline (ESPO) and a spur to China
    - Chinese companies in the Russian upstream
    - Rosneft in the Chinese downstream
    - Current exports of 15 mt/yr of crude, might exceed 40 mt/yr
    - Chinese credits (loans-for-oil):
      - $ 6 bln in 2005, $ 25 bln in 2009
    - Oil export contracts in 2013
      - 360 mt for 25 years Rosneft with CNPC ($ 270 bln)
      - 100 mt for 10 years Rosneft with Sinopec ($ 85 bln)

Strategic Objectives

- Diversification of export markets (focus on premium markets of the Asia-Pacific region)
- Exports of higher value-added products
- Stronger focus on the domestic market
  - further gasification of Russian regions
  - development of petrochemical and gas-chemical industry
- Development of the LNG business
- Support to small and mid-size companies that develop small, marginal or depleting fields
- Focus on prospecting, exploration, R&D and technology
- Development of partnerships with IOCs
  - continental shelf
  - enhanced oil recovery projects
  - hard-to-recover reserves
- Promotion of internationalization of Russian energy companies
- Fiscal reform
- Rules for foreign investments