



DECEMBER 2012

# who's who

# Number 20

Number

4.00 EUROS

Oil magazine no. 20/2012 - Targeted mailshot

**Eni quarterly - Year V**  
**N. 20 December 2012**  
**Authorization from the Court of Rome**  
**No. 19/2008 dated 01/21/2008**

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IMPRINTING • www.imprintingweb.com

*Printer:*

*In Italy:* Marchesi Grafiche Editoriali SpA - Rome

*In the U.S.:* Fry Communications Inc.

Mechanicsburg, PA

*In China:* Reference Standard Limited - Beijing

*Translated by:* RR Donnelley

*Text editing:* Abigail Asher



Sent to press on December 31, 2012



Selena Burgo Paper - Natural uncoated wood-free paper, 100% recycled, chlorine and acid free.

Publisher **eni spa**

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No. **20**

# Who's who



by **GIANNI DI GIOVANNI**

IOC, NOC. Together, these two acronyms represent the heart of the oil industry: the international production companies on the one hand, and their state-owned counterparts on the other. The first group has the most advanced technology and distribution organization, while the second holds virtually all of the available energy resources.

We decided to make the IOCs and NOCs the main subject of this issue of *Oil* not only because they have, for many years, been the key players in the profound transformation of the hydrocarbons sector, but above all

because the course of the relationship between the two groups will largely determine the future organization of the energy industry and the world's energy supply. In the following pages, readers will find articulate reflections on this subject, as well as detailed descriptions of how the oil companies – state-owned and not – are playing on the international scene.

One thing is clear: collaboration is inevitable. The national companies cannot do without the technological know-how of the IOCs, especially as they face the prospect of increasingly arduous conditions for finding and exploiting new energy sources. Nor can they ignore the market penetration capacity that the IOCs have reinforced over the decades. On the other hand, the private international companies cannot afford to go head-to-head with the NOCs; they would find it increasingly difficult to acquire new fields.

Cooperation is in everyone's interest. This fact is illustrated, in *Oil*'s overview, by the Qatari experience as described by **NASSER AL JAIDAH**, CEO of Qatar Petroleum International. The synergies between the state-owned company and the internationals have transformed this

small Arab country into one of the very top players in the realm of energy. More generally, as **BASSAM FATTOUH** of the Oxford Institute for Energy Studies explains, the presence of foreign companies is very visible across the entire MENA region – contrary to popular belief – and is making a fundamental contribution to the development of the upstream sector. A similar scene is beginning to emerge in Russia, says **SERGEY AGIBALOV**, senior expert at the Moscow-based Institute for Energy and Finance, and the same thing is also likely to happen – according to **LIFAN LI**, a professor at the Shanghai Academy of Social Sciences – with regard to the Chinese NOCs, which have been committed for many years to a vigorous strategy of international expansion that is hampered by autocratic rules. And then again, negative evidence supporting the need for agreements comes from another expert observer of energy topics: **JONATHAN STERN**, Chairman and Senior Research Fellow of the Natural Gas Programme at the Oxford Institute for Energy Studies. Stern points to the growing difficulties of the oil industry in Latin America and the Middle East due precisely to the inflexibility of the NOCs, which are spurring international companies to look for more welcoming markets.

But although the signs all point to collaboration, the balance between partners who “must” work together has yet to be defined, while everyone wonders how the new industrial strategies will affect future arrangements. This is the main theme of other contributions to this issue of our magazine, such as those from **ALDO FLORES-QUIROGA**, Secretary General of the IEF, **DAVID L. GOLDWYN**, President and founder of Goldwyn Global Strategies, economics writer **EVGENY UTKIN**, and **JOE GAGLIARDI**, Arctic Solutions Director of ION Geophysical.

These are deeply interesting topics, which we present as the lead-up to a crucial debate that will surely get underway in the energy sector in the near future.

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# Competition or cooperation?



**T**

by PAUL  
BETTS

Paul Betts has worked for the *Financial Times* for the past 36 years, spending 28 of them abroad as a correspondent in Rome, Paris, New York and Milan. He is currently based in London as a columnist covering international business affairs.

he relative roles played within the global oil economy by nationally owned companies (NOCs) and companies operating on a large international scale, mostly owned by multiple private investors (IOCs), have changed drastically in recent years.

Until the end of the 1960s, the IOCs were still the only important international oil operators, with more than 80 percent of the world's hydrocarbon resources on their books. After the wave of nationalizations that subsequently broke over the sector in the later years of the 20th century, the NOCs emerged as the dominant force in the sector, and today occupy increasingly important positions with respect to the IOCs, with around 90 percent of global reserves.

As a result, the NOCs are now able to lay down the law and determine the rules for access to new and existing reserves. Some of them are already turning into global competitors and extending their presence beyond national borders, challenging the IOCs. There has also been a significant shift in the contractual

relationship between the IOCs – which are looking to secure new reserves – and the NOCs – which need the technical, project management and marketing expertise of the IOCs – in the transition from the old system of “concessions” to “production sharing agreements” and, increasingly, to “service agreements.” The NOCs have also developed their own technical expertise, and can now rely on oilfield service companies and other operators to provide the know-how and structures that were traditionally provided by the IOCs.

It is therefore far from frivolous to wonder whether the NOCs, which operate and collaborate with the service companies, now have any need of the IOCs to achieve ongoing growth and international expansion. The simple answer is “Yes, they must continue to collaborate,” although this does not prevent them from competing amongst themselves, as has long been the case in a sector where the companies have always been simultaneously competitors and partners in a great many projects. However, in view of the huge shift in the balance of power in the sector, in favor of the nationally owned companies, the IOCs will need to be increasingly creative and flexible in developing their value propositions, in order to ensure continuing access to new and existing reserves.

The NOCs may possess the bulk of the world's petroleum resources, but they do not possess the markets. The IOCs, on the other hand, can provide the nationally owned companies with access to the main energy markets and can help to develop markets for new products. More importantly, both types of companies – despite the fact that the IOCs are essentially profit-oriented, while the NOCs inevitably have a broader range of national and social economic concerns – share common interests and challenges at a time of great uncertainty for the world economy, which is still struggling to recover from the biggest financial shock for more than 75 years.

Not least of these challenges is how to satisfy the ever-growing energy demands of our modern society. This means finding and developing new resources in hostile environments or technologically demanding situations, which in turn requires sector-level cooperation. The International Energy Forum (IEF) has

argued persuasively that cooperation between NOCs and IOCs is the way forward to secure and optimize investment in the oil and gas industry, help ensure its development, and by inference, improve global energy security of supply and demand. At the 2012 Ministerial Meeting in Kuwait, the IEF drew up a series of guidelines and principles for successful NOC-IOC cooperation.

The list is too long to be presented here. Suffice to say that the underlying concept of the guidelines is the construction of long-term partnerships based on reciprocal benefits, trust and respect, incorporating legitimate expectations in terms of economic development, environmental protection, technology transfer, development of the skills of the local workforce, development of infrastructures, and support for the local economy. Will all of this become the new Utopia of the oil industry, or is it just a vain illusion? The former, we hope. ●

The NOCs possess the bulk of the world's petroleum resources, but they do not possess the markets. The IOCs, on the other hand, can provide the nationally owned companies with access to the main energy markets

"Four million barrels by 2020," says **CAL DALLAS**, Alberta government minister

Canada Security  
 Water Hydraulic Fracturing  
 Energy Independence Environme  
 Middle East  
 Canada Oil  
 Energy Independence  
**Canadian**  
 Technology Environmental Impact Accessibility  
 Alberta Accessibility Technology Gas  
 Hydraulic Fracturing Oil San

Canada could soon become one of the world's major oil producers, thanks to the development of oil sands. The country has over 173 billion barrels of proven reserves and its oil fields cover an area the size of Florida

**C**anada has the third largest proven reserves of oil in the world, with 173, 625 million barrels, trailing behind Saudi Arabia and Venezuela. Much of the country's underground riches are due to oil sands, which account for two thirds of its current oil output; the largest fields, covering an area the size of Florida, are located in Alberta. In an exclusive interview with *Oil*, Alberta's minister for international and intergovernmental relations, Cal Dallas, told us that his home province of Alberta is not only in the running to become one of the world's leading oil producing regions, but also offers a "secure and stable environment" that is an ideal target for investment.

by SERENA VAN DYNE

**Thanks to oil sands, Canada has become the third leading country in the world for oil reserves. What is your current production and what are your expectations for the future?**

Today in Canada we're producing about 2.9 million barrels per day. The Province of Alberta alone produces about 2.4 million barrels, so a significant part – if not the vast majority – of the oil that's produced in Canada comes from Alberta.

Hydraulic Fracturing  
Shale Gas  
Oil  
Environmental Impact

# Middle East

Production Shale Gas Energy Independence

Investments Security

Canada Oil Sands

## Reserves

Security Production

Middle East

Hydraulic Fracturing

# Treasure

Shale Gas Water Investments

Energy Independence Production

Oil Sands Security Alberta Reserves Technology Middle East

And of the 2.4 million barrels, nearly 2 million barrels are derived from oil sands.

We are anticipating that by 2020 – eight years forward – daily production will be about 3.9 million barrels per day.

### What are your main oil export routes?

Most of the oil that is produced in Alberta is being marketed throughout the west of Canada and certainly a significant portion is exported to the United States. There is one oil pipeline that goes to the west, to the province of British Columbia, and there are three major pipeline systems that carry oil east, into the eastern part of Canada, but most of that then goes south into the United States. We also export a lot of natural gas through a pipeline system. In Alberta, we produce 123 billion cubic meters of natural gas per year, and more than half of that ends up being exported to the United States.

**In your opinion, how have oil sands in Canada and shale gas in the United States changed the world energy scenario? Your country and the United States are, and will be, decreasingly dependent on imports, in particular from the Middle East. Do you think this new energy scenario has also changed global geopolitics?**

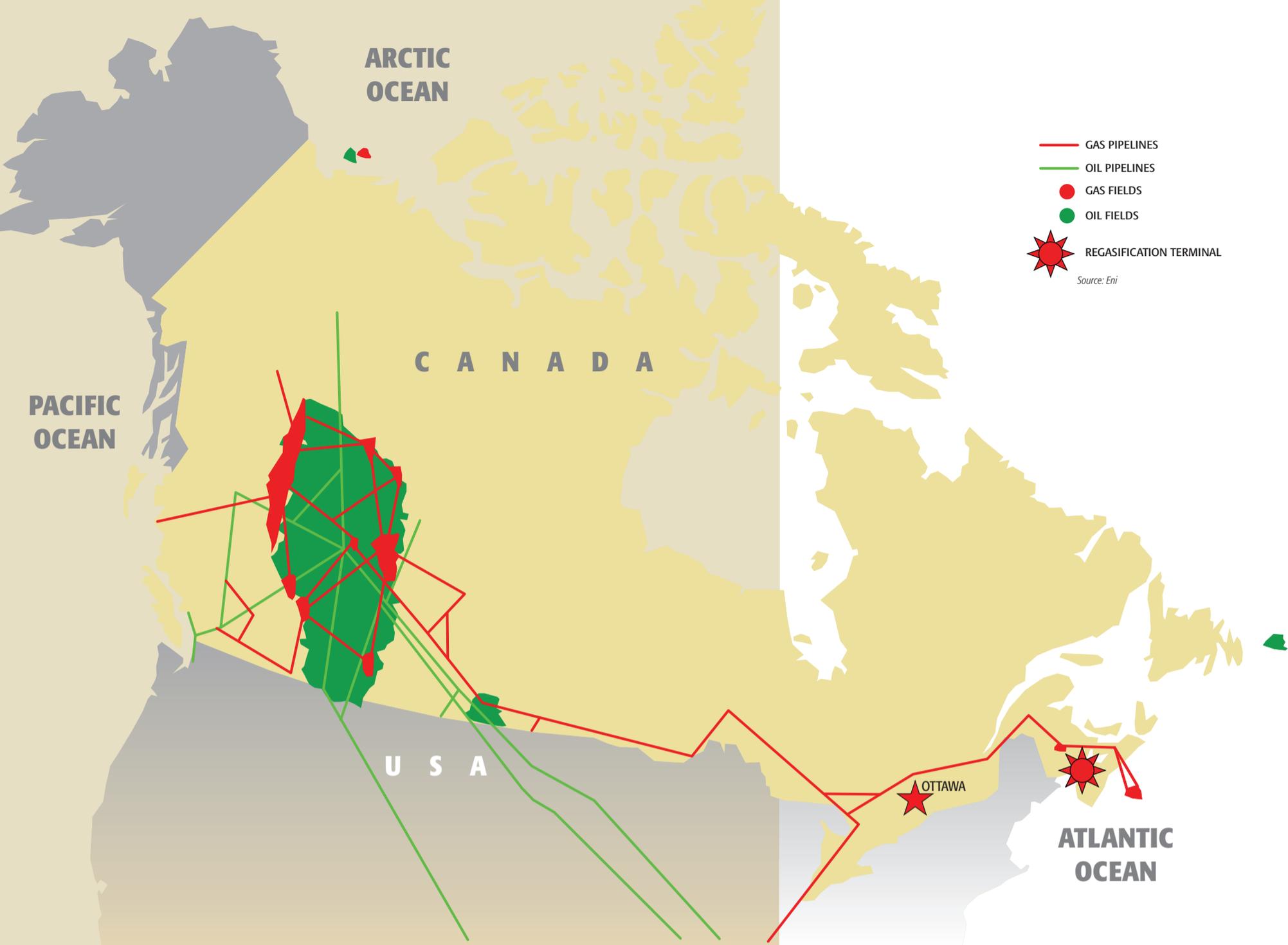
I think a number of countries around the world are trying to achieve energy self-sufficiency, and certainly in North Amer-

ica these discoveries are going to assist with that. However, so far the technological discoveries that help produce these formations are not sufficient to achieve that goal, so there is still a reliance on oil products moving round the globe. I think that the most significant thing for countries that are trying to achieve self-sufficiency is the fact that only about 13 per- →



### Cal Dallas

*Cal Dallas was elected as a Member of the Legislative Assembly for Red Deer-South on March 3, 2008 and re-elected on April 23, 2012. Mr. Dallas was appointed to cabinet on October 12, 2011 as the Minister of Intergovernmental, International and Aboriginal Relations and reappointed as Minister of International and Intergovernmental Relations on May 8, 2012. Prior to entering cabinet, Mr. Dallas served as parliamentary assistant to the Minister of Finance and Enterprise and parliamentary assistant to the Minister of Environment. He co-chaired Climate-Change Central, was vice-chair of the Regulatory Enhancement Project Task Force and served on the Cabinet Policy Committee on Energy. Prior to serving in the Legislative Assembly Mr. Dallas was Executive Director of the Red Deer Chamber of Commerce and, before that, he worked in the printing and publishing industry for 25 years, including nine years as publisher of the Red Deer Express.*



# Canada by numbers

<b>Area:</b>	9,984,670 km <sup>2</sup>
<b>Capital:</b>	Ottawa
<b>Population:</b>	34,300,083 (estimated in July 2012)
<b>Average population age:</b>	41.2 years (women: 42.4 / men: 40)
<b>Language:</b>	English (official) 58.8%, French (official) 21.6%, others 19.6%
<b>Natural resources:</b>	Iron ore, nickel, zinc, copper, gold, lead, rare earth elements, molybdenum, potassium, diamonds, silver, fish, timber, fauna, coal, oil, natural gas, hydroelectric energy
<b>Government:</b>	parliamentary democracy, federation, constitutional monarchy

## MAIN ECONOMIC INDICATORS

<b>GDP (at purchasing power parity):</b>	\$1.396 trillion (2011 estimate)
<b>GDP (at official exchange rate):</b>	\$1.711 trillion (2011 estimate)
<b>GDP growth rate:</b>	2.4% (2011 estimate)
<b>Unemployment rate:</b>	7.5% (2011 estimate)
<b>Public debt:</b>	87.4% of GDP
<b>Inflation:</b>	2.9%

## OIL

<b>Production:</b>	3,504 thousand barrels/day
<b>Consumption:</b>	2,229 thousand barrels/day
<b>Reserves:</b>	173,625 million barrels, as of December 31, 2011

## NATURAL GAS

<b>Production:</b>	158.43 billion cubic meters
<b>Consumption:</b>	104.64 billion cubic meters
<b>Reserves:</b>	1,700 billion cubic meters, as of December 31, 2011

Source: CIA World Factbook 2012; Eni World Oil and Gas Review 2012

cent of the world's oil is accessible to private investment, while the rest of those oil reserves are controlled by national governments. So the amount of oil that is definitely accessible for commercial transactions is very limited. In Alberta, where oil is accessible, more than half of the proven reserves are actually in oil sands. So we still see scenarios where there are significant trade opportunities to move oil product. We see ourselves as a secure and stable environment that has a commitment to environmental stewardship, and as a good alternative for companies that are trying to achieve self-sufficiency but are not able to do it, even with the new reserves that are just being discovered.

**As you said before, you need extremely advanced technology to extract oil from sands, or to obtain shale gas. Companies that come to operate in this field must therefore have the necessary skills and technologies.**

Technology certainly plays a crucial role in extracting resources. Moreover, the advances that have been made in terms of reducing the environmental impact of the extraction process have been based on enhancements and innovations in technology. As such, we are looking for companies that are willing to invest in and share the use of new technologies to allow us to extract more of the resource and to do it in a responsible way. Not all companies currently have the abilities or the necessary technology, but certainly this is also a great area for joint ventures to invest in the development of those technologies. Of course, many of those technologies are exportable, in the sense that it's in our interest to ensure that the new research and development that's taking place in Alberta is used around the globe as well, par-



ticularly in the areas of reducing the impact to the airshed, to water use, water quality and reclamation technology.

**On that subject, environmentalists seem worried about the use of oil sands. Are you concerned about this?**

We have very high expectations in terms of our ability not only to extract the resource, but also the manner in which we do it and the environmental impacts. So, the governments of Alberta and of Canada are making a great deal of effort to support companies that are actively involved in oil sands extraction. We're ensuring that we're doing everything we can to properly monitor, regulate, and enhance or reduce the environmental impact that we're having. We're making great strides in this area, so we're pleased about that, but we know advances in technology will continue to help us to reduce the impact of these extraction processes. The Conference Board of Canada has suggested that more than \$6 billion will be invested in climate-friendly technology in Alberta from 2010 to 2014; that's more than all other investments that they're incurring in all the other Canadian provinces combined. We therefore have a big stake in trying to use technology to reduce the impact of our oil sands development, and carbon capture and storage is just one of those initiatives.

**Canada's abundant resources have attracted many foreign companies. Europe is looking to Canada with interest, but China is also particularly well represented.**

Investments in Alberta by international oil companies have been rising rapidly over the last number of years, both from privately-owned companies and from state-owned companies. As we look at the scenario in terms of capital investments, North American companies are currently the

largest investors and, actually, you might be surprised to know that European companies are the second-largest investors. Asian investors are a distant third in terms of the total capital that is being invested in oil sands. These projects are very expensive, so sometimes – in fact more often than not – what happens is that companies will joint-venture in an initiative. We have many examples of oil sands partnerships between North American and European companies, or North American and Asian companies, and the like. Some of the U.S. companies – which, as I said, account for a significant part of the investments – include Chevron, ConocoPhillips, Devon Energy and certainly ExxonMobil. But we are seeing a lot of activity from the European companies as well, so we have investments in oil sands from companies including BP, Shell, Statoil and Total – some of which are very significant.

**What trade and investment opportunities are there in Canada for Italian companies?**

We in Alberta really view Italy as a priority for technology exchange. We certainly see the opportunity to attract investments from Italy and Italian investors, and we see the opportunity to forge some new business connections in a whole range of sectors.

**HUNTING FOR BLACK GOLD**  
**Drillships breach the Beaufort Sea pack ice in the Northwest Territories. Canada could become one of the world's leading oil producers in the coming years.**



A review of 2012 by way of its notable figures

# Nine people who shaped the energy sector



**GEORGE MITCHELL**  
The Texan engineer who pioneered the techniques that made possible the boom in shale gas production



**WANG YILIN**  
Chairman of the China National Offshore Oil Company, CNOOC



**LEON PANETTA**  
The U.S. Secretary of Defense



**HANS-JOSEF FELL**  
Member of the Green Party in the German Parliament



**IGOR SECHIN**  
Russia's oil czar and head of Rosneft



**DILMA ROUSSEFF**  
The President of Brazil



**HUGO CHAVEZ**  
The President of Venezuela



**CRISTINA FERNANDEZ**  
The President of Argentina



**ENRIQUE PEÑA NIETO**  
The President of Mexico

From the Texan engineer who invented the techniques for extracting shale gas to the U.S.

Secretary of Defense, and from the chairman of CNOOC – who is driving the overseas development of Chinese companies – to the head of Rosneft

# W

by MOISÉS  
NAÍM

Who had the largest impact on the energy sector in 2012? A scientist or a politician? Iran's mullahs or the CEOs of major oil companies? The energy industry is so diverse and complex that it is impossible to trace its fast changes to the actions of specific individuals.

No one is that powerful. Nonetheless, here below I name nine individuals who made a big difference last year. It is, of course, a highly personal and arbitrary list. My goal was to pick individuals whose actions vividly illustrate the important trends – good and bad – that are reshaping the industry.

## George Mitchell

**The Texan engineer who pioneered the techniques that made possible the boom in shale gas production.**

Three decades ago, Mitchell developed the techniques that – among other consequences – will make the United States the world's top natural gas producer by 2015. According to the International Energy Agency, the country could even become a net exporter of energy by 2020. The shale gas revolution is not limited to the U.S. Major shale gas deposits have also been found in Mexico, Canada and Argentina. The U.S. boom has inspired a widespread search for shale gas in Europe and China. The plummeting prices of gas are having immense consequences for other energy prices and are altering investment patterns and the pace and direction of the development of other sources of energy.

## Wang Yilin

**Chairman of the China National Offshore Oil Company, CNOOC.**

Geologist Wang epitomizes the increasingly important role that Chinese companies are playing in oil, gas and energy in general. While the power structure of China's energy sector is complex and not easy to ascertain objectively, there is no doubt that Wang Yilin, the chairman of China National Offshore Oil Company, plays an important role. When he was CNPC's Deputy General Manager, Wang championed China's participation as investor and technical partner in the giant Iranian Pars gas field. Now he is Chairman of CNOOC, the company in charge of upstream activities abroad and – based on assets – the world's 13th largest oil company. Many informed observers also credit him as being one of the main architects of China's geostrategic approach to its energy policy. In December 2012 CNOOC made the largest acquisition ever undertaken by a Chinese energy company abroad, a \$15 billion takeover of Canadian energy company Nexen.



Essentially, thanks to this policy of “going abroad,” during the last ten years China has acquired – through a multiplicity of joint ventures and acquisitions – offshore reserves of “equity oil” that allow the country to meet a third of its total oil consumption. Only two decades ago, Chinese oil companies were not part of the global picture. Today they are one of its defining elements – and Wang Yilin has been a major protagonist of this development. →



#### GREEN ENERGY

**A solar energy facility in northern Germany. Germany's electricity generation from wind and solar power is increasing exponentially, while carbon dioxide emissions have fallen by a quarter since 1990.**

### Leon Panetta and Hans-Josef Fell

**The U.S. Secretary of Defense and a member of the Green Party in the German Parliament.**

These two individuals symbolize initiatives promoting the large-scale adoption of renewable energy practices. As U.S. Secretary of Defense Panetta has continued and expanded the Pentagon's efforts to become greener, while Fell is the main force behind the legislation that is rapidly expanding Germany's dependence on renewable sources of energy.

In April 2012 the Department of Defense announced plans to install three gigawatts (GWs) of renewable energy capacity at Army, Navy, and Air Force installations by 2025 (one gigawatt being enough to supply electricity to about 800,000 homes, equivalent to the capacity of the Three Mile Island nuclear reactor in Pennsylvania).

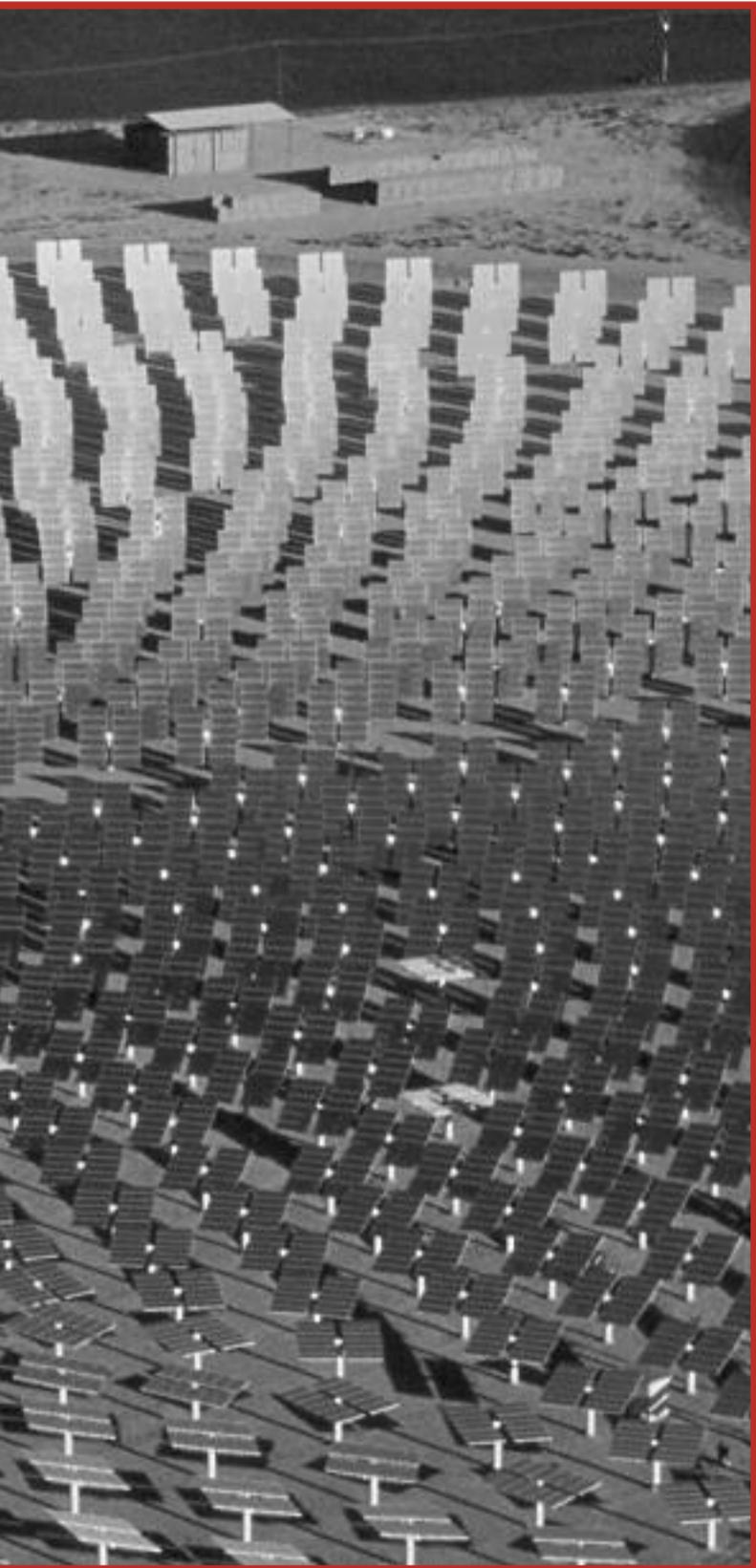
This announcement was another example of the substantial commitment of the U.S. Department of Defense, a massive consumer of energy in all its forms, to becoming more reliant on renewable energy. In his January 2012 State of the Union address, President Obama announced that by 2020 the U.S. Navy would have one gigawatt of renewable energy in each of its installations.

The U.S. military is also planning to set up 160,000 solar energy systems in 33 U.S. states. While green energy is being actively promoted in the U.S., it has become a true revolution in Germany, largely due to the 2000 adoption of the Renewable Energy Act, the initiative of Green Party member Hans-Josef Fell. The act established strong financial incentives for investors in renewable energy. Today solar and wind power have shown exponential growth. Electricity generation from wind power has increased by 25 percent of total output while carbon emissions are down to one-fourth of 1990 levels. The German government is initiating a \$270 billion program to install wind farms which will cover an area six times the size of New York City.

### Igor Sechin

**Russia's oil czar and head of Rosneft.**

As head of Rosneft, Igor Sechin has been the main actor in the two most important events in the Russian oil industry during 2012. The first was the \$56 billion stock and cash deal through which British Petroleum acquired 20 percent of Rosneft while Rosneft acquired the Russian AAR consortium that owned 50 percent of TNK-BP. The new entity will



## Dilma Rousseff, Cristina Fernandez and Hugo Chavez

### The Presidents of Brazil, Argentina and Venezuela.

These three leaders preside over countries with policies that hurt their oil and gas sectors. The nature and extent of these self-inflicted wounds varies among the three, with Venezuela being the most extreme example. But in all three nations a change of policies could yield immense benefits.

In Argentina, President Fernandez took over the shares in YPF, that country's largest oil company, that were owned by Spain's Repsol. Other policies of her government, and an unsustainable macroeconomic environment, also discourage or delay the initiatives that Argentina needs to achieve its significant energy potential.

In Brazil, President Rousseff has been imposing rules that force Petrobras to buy as much as 70 percent of its oil and gas equipment in the domestic market. Such rules not only fuel protectionism but may even contribute to delaying the development of Brazil's massive offshore, pre-salt oil resources. Moreover, no oil auctions for onshore new acreage in Brazil took place in 2012. Auctions for offshore, pre-salt areas will probably have to wait even longer, as the country remains undecided about the legal and taxation treatment it should give to oil reserves found in the pre-salt.

In Venezuela, the explosion of the Amuay refinery – one of the world's largest – dramatically called attention to that country's dwindling capacity to manage what used to be one of the most respected oil companies – PDVSA – and adequately exploit the huge hydrocarbon reserves the country has.

The problems that these three countries will be facing in their oil and gas sectors in coming years will be largely if not completely self-inflicted – a trend that is not restricted to South America.

## Enrique Peña Nieto

### Mexico's new president.

A few days after his inauguration, the new president announced a pact among the main political parties to support an ambitious reform program that, if implemented, can substantially change Mexico in general and its energy sector in particular.

Since Lazaro Cardenas nationalized this industry, total state control of oil has been a Mexican dogma. The cost has been increasingly high, as Mexican oil production has dropped from about 3.5 million barrels a day in 2004 to some 2.5 million barrels in 2012. Exports to the United States in 2012 are only two thirds of what they were some six years ago. At this rate, Mexico will become a net oil importer by 2020. President Peña Nieto has vowed to introduce changes in Mexican legislation that would allow private companies to enter Mexico's upstream oil activities.

He will face significant political opposition, including from within his own party, and from the labor unions that have long held a tight grip on Pemex. It is too soon to predict the outcome of his efforts, but it is clear that an opening of the Mexican oil industry to private, international participation could produce a major shift in the western-hemisphere energy equation and bring Mexico back to the international energy arena.

During 2012, two definite global trends seem to have emerged in the energy sector. One is the increasing importance given to the development of renewable sources of energy, a trend that appears to be irreversible. The other is the relative weakening of resource nationalism. With the exception of Iran and Venezuela, most important oil-producing countries exhibit an increasingly pragmatic attitude towards peaceful co-existence and cooperation with international oil companies.

produce four million barrels of oil a day, nearly half of Russia's oil production. The deal gives the government an even larger weight in the oil industry, while BP now has the largest stake owned by any foreign company in a Russian state enterprise. First Deputy Prime Minister Igor Shuvalov has announced the government's intention to privatize Rosneft sometime in the next two years, "depending on market conditions." The second event presided over by Sechin in 2012 was the joint exploration in the Arctic Sea by Rosneft and foreign oil companies. Three agreements have already been signed by Rosneft: with ExxonMobil, with ENI and with Statoil. The agreement with ExxonMobil, in particular, calls for an initial investment of \$3.2 billion to explore in the Kara Sea, with the potential of increasing the investment significantly in the future, and the participation of Rosneft in some of ExxonMobil's global properties. ENI has acquired a 33 percent stake in the development of two blocks in the Barents Sea and the Val Shatsky field in the Black Sea, while Statoil has obtained exploration licenses in the Barents Sea and in the Sea of Okhotsk. These events reaffirm Sechin's status as Russia's oil czar while clearly illustrating the kind of trends that have come to define a nation that is one of the world's top energy suppliers.

Moisés Naim, a scholar at the Carnegie Endowment for International Peace in Washington, is a member of *Oil's* editorial board. His next book, *The End of Power: From Boardrooms to Battlefields and Churches to States, Why Being in Charge Isn't What It Used to Be*, will be published in March. He served as Venezuela's Minister of Trade and Industry (1989-1990) and was the editor-in-chief of *Foreign Policy* magazine between 1996 and 2010.

The shale gas revolution is not limited to the U.S. Major shale gas deposits have also been found in Mexico, Canada and Argentina. The U.S. boom has inspired a widespread search for shale gas in Europe and China



On [www.abo.net](http://www.abo.net), read other articles by the same author

The IEF's **ALDO FLORES-QUIROGA** talks about challenges and prospects

# There is no growth without energy

We can expect an increase in energy resources over the short term, but investment and energy security need work now. And we should also keep an eye on U.S. policy changes

**E**nergy output has continued to increase despite all the different types of shocks in recent decades. So it is reasonable, says Aldo Flores-Quiroga, Secretary General of the International Energy Forum, to forecast that this trend will continue, and that the innovations ahead will “point to a promising energy future.” Speaking to us during the most recent Oil & Money conference in London, Flores-Quiroga also discussed oil prices and speculation, investment, U.S. policy and the Iran embargo, providing a holistic view of the energy sector of today.

by **SIMON TOMPKINS**

**OPEC has said that \$100 would be a fair**

#### **price for oil. What do you think of that?**

The fair price depends on whom you are talking to, and there is a very broad range of views. I think that we should really stick to the idea that the fair price is one that is good for both producers and consumers.

#### **But the Secretary General of OPEC, Abdalla Salem El-Badri, says that the current price is too high.**

There is still a concern – given the experience of 2008 – that financial markets are playing a “muddled” role in the process of price formation. I think we had a kind of bubble, and we are currently seeing a process in which it’s very hard to tell if something similar is happening. Right now there are clearly some expectations on geopolitical events that are affecting the market.



### NOT ONLY PRODUCERS OR CONSUMERS



The International Energy Forum (IEF) aims to foster greater mutual understanding and awareness of common energy interests among its members. The 89 Member Countries of the Forum are signatories to the IEF Charter, which outlines the framework of the global energy dialogue through this inter-governmental arrangement. Covering all six continents and accounting for around 90 percent of global supply and demand for oil and gas, the IEF is unique in that it comprises not only consuming and producing countries of the IEA and OPEC, but also Transit States and major players outside of their memberships, including Argentina, Brazil, China, India, Mexico, Oman, Russia and South Africa.

According to people who work with the fundamentals, the fundamentals don't appear to be so weak as to justify a degree of nervousness that could be associated with a high price.

But it's very difficult to say that prices are too high or too low against what the market should be. I think that to venture a proposal of what would be the right price would be to enter into very uncertain territory.

#### Could such high prices be traced back to speculation?

Speculation means different things to different people. When used for hedging and planning, speculation has played a useful role in the markets. But speculation when seen as market manipulation – which is what most people think of when they hear it – is not what we want to see, of course.



#### **Aldo Flores-Quiroga**

*Aldo Flores-Quiroga took up his post as IEF Secretary General in January 2012. Quiroga served in the Mexican government as Assistant Secretary for International Affairs at the Ministry of Energy (2007-2011), and as Assistant Secretary for Bilateral Economic Relations at the Ministry of Foreign Affairs (2001-2005). He also worked as an independent consultant on trade and industrial policy to the Food and Agriculture Organization, and the governments of Mexico and the Dominican Republic (2005-2006). Before joining the Mexican government he was Assistant Professor at the School of Politics and Economics of the Claremont Graduate University in California. Dr. Flores-Quiroga has published in English and Spanish on trade and exchange rate policy.*

# Oil prices. Point and counterpoint

During the Oil&Money 2012 event held in London in October, a panel of ministers brought together Abdalla Salem El-Badri, OPEC Secretary General; Maria van der Hoeven, Executive Director of the International Energy Agency; Abdulla Bin Hamad Al-Attiyah, Chairman of the Administrative Control and Transparency Authority of Qatar; and Aldo Flores-Quiroga, Secretary General of the International Energy Forum

"I think, I will always say it, I will say it (inaudible) but speculation is the problem. (...) Speculation is part of the market and nobody can eliminate it. Excessive speculation, that's what we are talking about. Now, as I said, you know, if the paper market is three times the physical market, that means there is something wrong. So OPEC is not asking to eliminate the speculation element of the market, but I'm sure everybody knows that the market is, and I repeat, the market is very well supplied."

**ABDALLA SALEM EL-BADRI • SECRETARY GENERAL OF OPEC**



"What about prices? I agree. It's important that market fundamentals determine the price. That's what we are all talking about and that's sound market policy, but of course there is sometimes always an anticipated risk or an anticipated expectation, what might happen, and this I think is not a very sound position, but it's there. As far as speculation goes, well, this is, I think we have a slightly different view on this because we do have some, we had some international surveys of that and there is not a real, how shall I put it, evidence of speculation on the long run, in the longer term, but of course in the short term there are always other things that influence the price."

**MARIA VAN DER HOEVEN, EXECUTIVE DIRECTOR OF IEA**



"When you talk about the economic growth, oil price, the product, the forecasting, I never, never felt all this what analysts or forecasters come to you and say, and give you a presentation about two/three hours. (...) So I think, in my opinion, I left with the new theory: don't trust forecasters. (...) Every time it really is very confusing because the market is very psychological..."

**ABDULLA BIN HAMAD AL-ATTIYAH, CHAIRMAN, ADMINISTRATIVE CONTROL AND TRANSPARENCY AUTHORITY OF QATAR**



One thing is clear right now: we are in a new area of market pricing, and financial markets will continue to play a role in defining that.

The jury's still out with respect to whether this is making the oil market more or less efficient. We have seen less volatility in commodities that are traded in financial markets than those that aren't, but the evidence still has to accumulate before we reach a final conclusion.

**One crucial issue in the energy sector is the importance of investments ...**

That is a key challenge that we are facing. Investments depend on expectations about future demand. In turn, those expectations depend on good information regarding consumption plans and capacity plans, and that means transparency of information in general, which is where we come into the equation.

For more investments – or the right investments – to materialize, we will need much better data transparency, and we still have a long way to go on that.

**Another challenge is the security of supply; are we a long way from real energy security?**

I don't think so. Indeed, I think that the increases in production that we're seeing in different parts of the world, and that are expected from new regions in Africa, the Middle East, and perhaps Asia, should give us enough pause and tranquillity about the availability of energy resources. The challenges lie elsewhere, like with the structuring of the markets themselves.

Markets need to be more resilient, less prone to nervous reactions, and again that will be addressed with greater transparency. You mentioned security of supply; remember that nobody makes the type of investments that are required in the oil and gas industry without an expectation of a reasonable return on those investments. That means that a better understanding of trends in demand is important. One challenge we still face is to provide access to indicators of investment plans and of policies that will be affecting demand in the short and long term.

**The United States have elected Obama for a second term. What now for U.S. energy policy?**

We will have to observe what the U.S. does. We have already seen that increasing output in the U.S. is going to cause changes in the world market.

We should be paying a lot of attention to what happens in the U.S., as there might be a re-balancing – or a re-direction, rather – of oil and gas flows in different regions, and these will affect our policies.

**Iran has said that it could stop oil production if the pressure increases. Do you think that's possible? Could it really come to that?**

I think that with respect to every country, not just Iran, we should be aiming for policies that provide enough robustness and resiliency so that there's a healthy growth in production and healthy expectations that demands are going to be met wherever they are made. Iran has been contributing in that regard: like many other countries, Iran faces challenges of policy, and our task at the IEF is to help provide information and elements that can help countries in making these decisions in a much more informed way. We also have to interact with their partners, which is what consumer/producer dialogue is.

**National oil companies are being increasingly aggressive as they address numerous problems around internationalization and cooperation with foreign companies. What do you think about this change, and what are the challenges for national oil companies?**

We have an NOC/IOC forum in the IEF which is taking place in New Delhi this February. Overall, the NOC sector is working very hard to find avenues of cooperation and collaboration, in what are becoming more and more complex projects all over the world.

National oil companies are controlling such a large share of the world's reserves and are also thinking differently about how to develop them. This means that we're going to see much more collaboration with IOCs and with the service companies that are now also becoming important players in this



*We should be paying a lot of attention to what happens in the U.S. during Obama's second term. There might be a re-direction of oil and gas flows in different regions*

new reality. So I still foresee NOCs as playing a vital role, and eventually developing even more expertise and innovation at a pace that we haven't seen before, spurred on by these challenges and also the opportunities that they are beginning to seize with IOCs.

**The International Energy Agency forecasts a new "golden age" of gas. What do you think about that? What is your vision of the sector's future, considering the boom in shale gas in the United States?**

It's a promising future. However, to get from where we are now – in terms of the usage of gas and the world market – to a place where gas plays a more prominent role, is going to take a while. It requires much more investment and infrastructure to make a gas market work than for other sources of energy.

What I mean to say is that this "Golden Age" of gas, which already seems to be happening in the U.S., is linked to a whole set of conditions that exist in the U.S. but not in other countries. That is not to say that other countries must have the same conditions as the U.S.

But a profitable gas market requires good infrastructure, and a workable trading hub for gas requires liquidity and infrastructure for distribution with many suppliers and many demanders.

In turn, a more efficient world market needs more trade between regions, and that will depend a lot on what happens with liquefied natural gas, which is still an open question. It depends a lot on whom you talk to: some analysts see fast growth for LNG, mainly in trade between the Middle East

and Asia, but others say that this is going to take longer, because shale gas is going to address part of the consumption requirements of some big consumers like the U.S. and China.

**What is your vision of the energy sector in the next 40 years?**

In the next 40 years? Let's try to think about it differently: 40 years ago, in the 1970s, I don't think anyone foresaw what we're seeing now. But there is one thing we must keep in mind: in 40 years we have seen all kinds of shocks – wars, economic booms, economic recessions – and every year the production of energy has continued to increase. So despite all these transformations, I think it is reasonable to expect this trend to continue.

There is no growth without energy; energy is a challenging business, but it's also a good business, and I think we'll continue to see innovations that will point to a promising energy future. That said, we will need to see much more innovation for clean energy, so that these next 40 years become years of sustainable energy too. And this applies not only to renewable energies, but also – and above all – to how we're going to be using hydrocarbons.

Researcher **JONATHAN STERN** says that the future of gas is uncertain

# Time to rethink strategy

International energy companies need to change their business model: their task now is to find resources in countries that allow outright ownership, as North America does with shale gas and shale oil



**T**

by DANIELLE  
DERN

he future of gas in Europe is uncertain and very dependent on renewable energies – not to mention the complex space in which national and international companies will soon have to interact in order to access and gain control of resources. In the long term, national companies seem to hold the advantage: “I think we do see collaboration and we will see collaboration, but national oil companies are now in charge of their resources and we need to understand that. And many national oil companies don’t believe they need international oil companies. They might be wrong, but that’s their belief.” This – and more – was revealed in

conversation with Jonathan Stern, President and Senior Research Fellow of the Natural Gas Programme at the Oxford Institute for Energy Studies, during the European Autumn Gas Conference 2012 in Vienna.

**Professor Stern, what role do you believe gas will play in the European economy over the coming decades?**

At the moment, in most European countries gas demand is declining and that means that gas will play a smaller role. But this is not necessarily going to continue forever and so we might see gas maintaining its role in smaller energy balances. So it’s very difficult to say that gas will have a growing role, at present.

The question is, will it be able to hold its share in energy balances, that is what is not certain.

**What will be the key drivers, and what impact will they have on the market in the future?**

Well, the principal drivers at the moment are carbon policy, renewables and carbon targets. So, to the extent that companies and governments are successful in promoting renewables, there will be less gas. The second very big question is the price of gas and whether that price will continue to be related to oil, or whether it will become a market price. If gas is going to increase its role, then the price must fall, relative to other fuels. But it looks as if some producers will not accept that, and if that continues, then, as I say, gas will be a smaller share of the energy balance.

**So the "Golden Age" of gas is coming to an end...**

The "Golden Age" of gas in Europe finished around 2006. This is not just because of decarbonization; it's also for economic growth reasons and the recession. And also because the price of gas is too high. So the future is not certain, but the period since 2006 has been relatively bad, and 2012 was worse than 2011. So demand in 2012 was back to the levels of the early 2000s, a trend that needs to be reversed, and at the moment that's not happening. But part of it is the problem of European economic growth, which is very low.

**Nowadays international oil companies, the IOCs, are denied access to the world's largest and cheapest reserves of oil and gas. International oil companies can access less than 10 percent of all global oil reserves and less than 30 percent of global gas reserves. In your opinion, is it possible to change this situation now?**

It's not possible to change the situation in resource-rich regions such as the Middle East and Latin America, because these governments and their companies want to control their own resources. Some of them are prepared to give IOCs a share, but they do not want IOCs controlling these reserves. Mostly that means the reserves will be developed slower than if IOCs were controlling them.

The only way that IOCs can increase their ownership of resources is finding new reserves in countries which will allow them to own those reserves, hence shale gas and shale oil in North America. There's no other way for IOCs to continue their business model of owning and developing oil and gas reserves.

**Over the past few years, technology and cost reduction have made LNG the better choice for international companies to solve many problems. However, there are obstacles to building regasification terminals, and this prevents the introduction of LNG in these markets. How can international oil companies overcome this problem?**

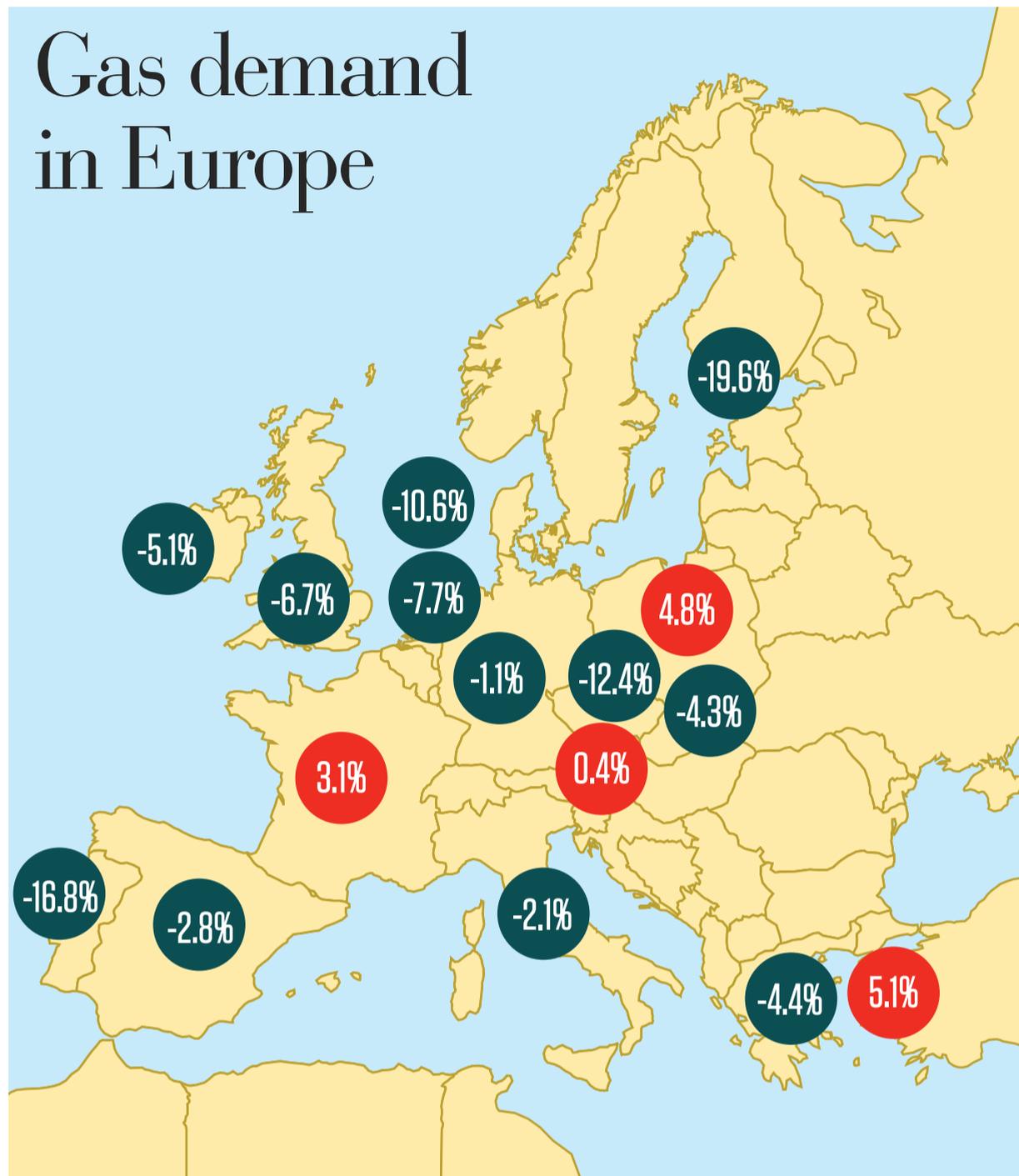
The cost reduction process in LNG finished around 2006. Since then, costs have gone up enormously – for some projects by a factor of four – and this is one of the biggest obstacles to new projects. So, the last cheap LNG facilities were built in Qatar. Since then, all of the new LNG facilities are much more expensive. At the moment almost all projects are over budget, sometimes as much as twenty percent. Many of them are not on schedule; for example the Australian Pluto project just came on stream, well over a year late.

So the industry is getting a little bit out of control in terms of costs and time schedules. The projects are huge, much too big for any one company, and what the industry needs to do is to exert downward cost pressure and get projects back under control. To have a project now costing \$40-50 billion sounds like too much money. It's incredibly difficult to do very big and very risky projects, because of the cost overrun risk. A cost overrun on a \$10 billion project is bad, but on a \$40 billion project you could find the cost overrun is \$10 billion, which is frightening.

**What can we expect for the future – are we going to see the domain of the IOCs or of the NOCs (national oil companies) in the energy world? Or do you think that the two can work together? If so, in which areas could they collaborate?**

I think we do see collaboration and we will see collaboration, but national oil companies are now in charge of their resources and we need to understand that. And many national oil companies don't believe they need international oil companies. They might be wrong, but that's their belief.

# Gas demand in Europe



There are areas where it's very clear that they need international oil companies. LNG, deep offshore operations and the Arctic are three areas where they definitely need international companies. But we should expect, as these national companies become more sophisticated, more technologically trained, that they, in time, will not need international oil companies.

And this is a big problem for the business model of the international oil companies. Where in the future is it that they will be indispensable, that they will have to be involved? I think it's a big problem. Clearly in countries – for example in East Africa – which have just discovered gas, which have no experience in oil and gas, then IOCs have a big role. But there are not so many countries like that anymore.

**THE DECLINE OF BLUE GOLD**  
Year-on-year demand for gas fell almost everywhere in Europe during the first two quarters of 2012, due to excessive prices and the near-absence of economic growth in recent years.



**Jonathan Stern**

A world-renowned expert on energy issues, Jonathan Stern is the President and Senior Research Fellow of the Natural Gas Programme at the Oxford Institute for Energy Studies. Among other roles, he is Honorary Professor at the Centre for Energy, Petroleum & Mineral Law & Policy, University of

Dundee; Visiting Professor at Imperial College's Centre for Environmental Policy in London; and Part Time BP Professor at the Moscow School of Management's Energy Centre at Skolkovo. Since 2011 he has been the European Union's speaker for the EU-Russia Gas Advisory Council. He is the author of several books and many shorter works on energy and gas.

**HIGHER COSTS**  
 A liquefied natural gas (LNG) carrier ship in Ras Laffan, close to Doha, Qatar. The costs of bringing LNG projects to production have increased considerably since 2006, which is one of the major obstacles to more widespread use.



*The future is not certain. The trend of gas demand needs to be reversed, but at the moment that's not happening*

**So do you see the future of energy as being dominated by national oil companies?**

I believe that international oil companies have to reinvent their business model. It's been a very successful model for a long time – you go to a country, you find oil and gas, you sign an agreement with the government which says we get this much, you get that much, you produce for many decades. But that was from a time where these countries had no capabilities. The world has changed.

**Nowadays, fifty percent of gas reserves are located in three countries: Russia, Iraq and Qatar. But the global spread of unconventional gas is changing the distribution model. There are many resources in North America, Australia, and China. What does this mean in terms of developing the security of supplies and affordability? Which companies will take the most advantage of this?**

Outside of North America, the only significant unconventional gas is being produced in Australia. Everywhere else it is potential. I don't expect significant, unconventional gas to be produced anywhere outside North America and Australia for another decade. In the 2020s, yes, definitely we shall see unconventional production – but it will be a decade before this happens on any significant scale.

Now, we have to understand that in North America it was not the big international companies that developed unconventional: it was small companies. So these big international companies will have a role, but the size of the role will really depend on whether there is a big advantage in developing unconventional – as opposed to conventional – gas elsewhere. Because in North America the reason the companies went to unconventional is they had largely depleted low-cost conventional gas. Many countries have not yet developed their conventional gas. In Europe, most of the conventional gas

has been produced, but I think it will be very difficult, for environmental reasons, to develop unconventional gas on a large scale. There's a lot of opposition and I'm uncertain of how that will end up.

**Because of problems related to fracking?**

Because of fracking, and drilling anywhere on land; because of land use and water use. There is very big opposition to any kind of land and water disturbance.

**So, anywhere is fine, but not in my back yard?**

That's right. And governments are generally afraid to maybe create opposition from their electorates. I'm not completely pessimistic, but I think it will take time. And for sure, it has to have a different business model compared with the U.S. No country in Europe is going to allow thousands of wells a year to be drilled, which is what happens in North America, where around 45,000 wells a year are drilled. To think of a thousand wells a year being drilled in a European country is probably unrealistic. So, I think unconventional gas will take time and will become significant outside North America, but only in the 2020s and not necessarily in Europe.

# WHO'S WHO

In the new millennium, a number of issues have re-emerged in the global oil panorama: oil prices have gone through the roof, there are fears that the planet will be unable to sustain energy demand from the U.S., China and India, and there are worries over the security of oil supplies. In this context, international oil companies (**IOCs**) also have to address the increasing challenge posed by national oil companies (**NOCs**) in the global race for control of reserves and markets for oil and natural gas. In the following pages, we compare IOCs and NOCs against the increasingly competitive background of today and analyze their market perspectives and business models.

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**Anadarko**  
**ANADARKO**  
**Nationality:** USA  
**Ownership:** Multinational  
**CEO:** R. A. Walker  
**President:** J. Hackett  
**Turnover:** 13,967

**Reserves:** 771  
**Production:** 78

**Reserves:** 1,563  
**Production:** 159

**Total hydrocarbons reserves:** 2,334 • **rank:** 24  
**production:** 237 • **rank:** 23

**ENI**  
**Nationality:** Italy  
**Ownership:** Cassa Depositi e Prestiti (27%); others (73%)  
**CEO:** P. Scaroni  
**President:** G. Recchi  
**Turnover:** 154,731

**Reserves:** 3,434  
**Production:** 308

**Reserves:** 3,790  
**Production:** 279

**Total hydrocarbons reserves:** 7,224 • **rank:** 16  
**production:** 587 • **rank:** 16

**SUNCOR**  
**Nationality:** Canada  
**Ownership:** Multinational  
**CEO and President:** Steve W. Williams  
**Turnover:** 39,225

**Reserves:** 3,670  
**Production:** 517

**Reserves:** 257  
**Production:** 40

**Total hydrocarbons reserves:** 3,927 • **rank:** 20  
**production:** 557 • **rank:** 17

**TOTAL**  
**Nationality:** France  
**Ownership:** Multinational  
**CEO:** C. De Margerie  
**President:** T. Desmarest  
**Turnover:** 186,229

**Reserves:** 5,784  
**Production:** 447

**Reserves:** 5,738  
**Production:** 416

**Total hydrocarbons reserves:** 11,522 • **rank:** 14  
**production:** 863 • **rank:** 13

**BP**  
**Nationality:** UK  
**Ownership:** JP Morgan (26.5%); others (73.5%)  
**CEO:** T. Hayward  
**President:** C. Svanberg  
**Turnover:** 357,517

**Reserves:** 10,565  
**Production:** 787

**Reserves:** 7,775  
**Production:** 513

**Total hydrocarbons reserves:** 18,340 • **rank:** 11  
**production:** 1,300 • **rank:** 7

**TULLOW**  
**Nationality:** Ireland  
**Ownership:** Multinational  
**CEO:** A. Heavey  
**President:** S. Thompson  
**Turnover:** 4,096

**Reserves:** 244  
**Production:** 21

**Reserves:** 60  
**Production:** 9

**Total hydrocarbons reserves:** 304 • **rank:** 27  
**production:** 29 • **rank:** 26

**CHEVRON**  
**Nationality:** USA  
**Ownership:** Multinational  
**CEO and President:** J. Watson  
**Turnover:** 253,706

**Reserves:** 6,455  
**Production:** 675

**Reserves:** 5,358  
**Production:** 337

**Total hydrocarbons reserves:** 11,813 • **rank:** 13  
**production:** 1,012 • **rank:** 10

**QUICKSILVER**  
**QUICKSILVER RESOURCES**  
**Nationality:** USA  
**Ownership:** Multinational  
**CEO:** T. Darden  
**President:** G. Darden  
**Turnover:** 944

**Reserves:** 105  
**Production:** 5

**Reserves:** 403  
**Production:** 23

**Total hydrocarbons reserves:** 509 • **rank:** 26  
**production:** 28 • **rank:** 27

# IOC & NOC

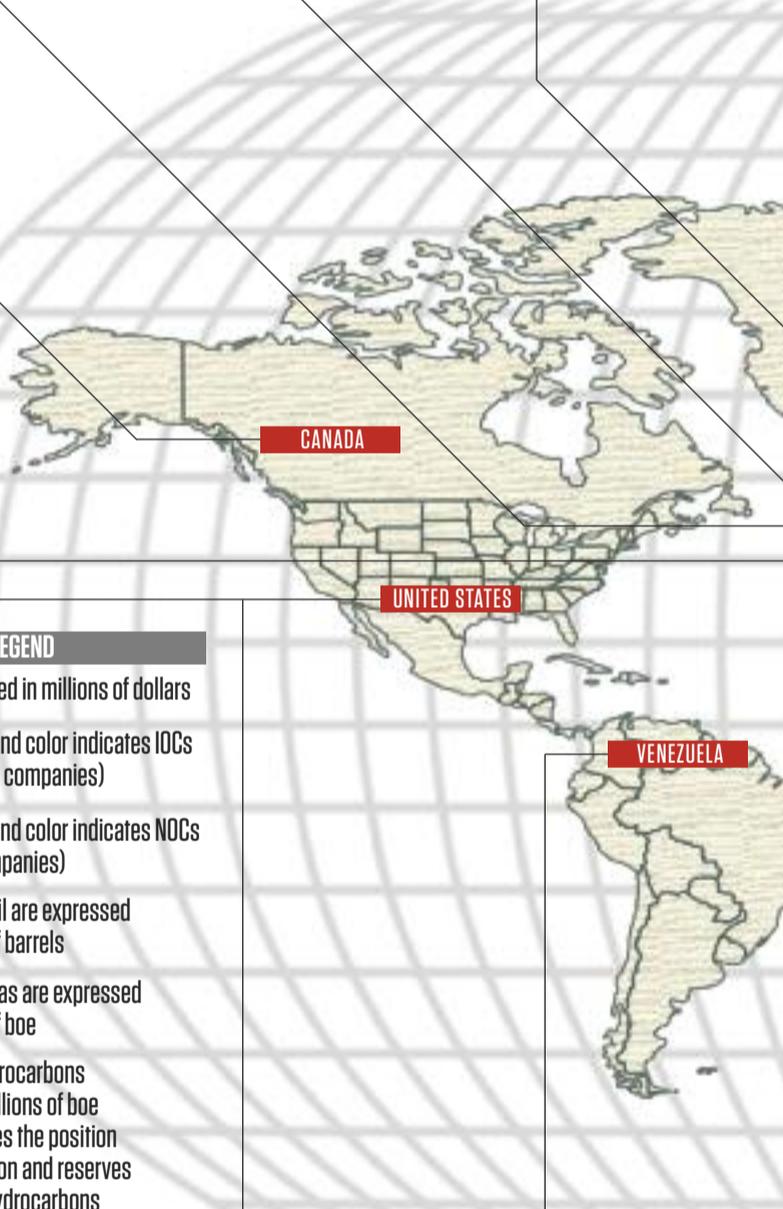
**LEGEND**

Turnover is expressed in millions of dollars

- The background color indicates IOCs (international companies)
- The background color indicates NOCs (national companies)
- Figures for oil are expressed in millions of barrels
- Figures for gas are expressed in millions of boe

Figures for total hydrocarbons are expressed in millions of boe  
 The ranking indicates the position in terms of production and reserves in relation to total hydrocarbons

*Source: Nomisma Energia*



**Chesapeake**  
**CHESAPEAKE**  
**Nationality:** USA  
**Ownership:** Multinational  
**CEO and President:** A. K. McClendon  
**Turnover:** 11,635

**Reserves:** 545  
**Production:** 32

**Reserves:** 2,898  
**Production:** 188

**Total hydrocarbons reserves:** 3,443 • **rank:** 21  
**production:** 219 • **rank:** 24

**ConocoPhillips**  
**CONOCO PHILLIPS**  
**Nationality:** USA  
**Ownership:** Multinational  
**CEO and President:** R. Lance  
**Turnover:** 251,226

**Reserves:** 4,506  
**Production:** 292

**Reserves:** 3,881  
**Production:** 308

**Total hydrocarbons reserves:** 8,387 • **rank:** 15  
**production:** 600 • **rank:** 15

**devon**  
**DEVON**  
**Nationality:** USA  
**Ownership:** Multinational  
**CEO:** J. Richels  
**President:** J. Larry Nichols  
**Turnover:** 11,454

**Reserves:** 1,259  
**Production:** 81

**Reserves:** 1,746  
**Production:** 159

**Total hydrocarbons reserves:** 3,005 • **rank:** 23  
**production:** 240 • **rank:** 22

**eog resources**  
**EOG RESOURCES**  
**Nationality:** USA  
**Ownership:** Multinational  
**CEO and President:** M. Papa  
**Turnover:** 10,126

**Reserves:** 692  
**Production:** 52

**Reserves:** 1,362  
**Production:** 102

**Total hydrocarbons reserves:** 2,054 • **rank:** 25  
**production:** 154 • **rank:** 25

**EXXON**  
**EXXON**  
**Nationality:** USA  
**Ownership:** Multinational  
**CEO and President:** R. Willerson  
**Turnover:** 486,429

**Reserves:** 16,049  
**Production:** 844

**Reserves:** 13,451  
**Production:** 897

**Total hydrocarbons reserves:** 29,500 • **rank:** 9  
**production:** 1,741 • **rank:** 4

**PDVSA**  
**PDVSA**  
**Nationality:** Venezuela  
**Ownership:** State  
**CEO and President:** R. Ramirez Carreño  
**Turnover:** 94,292

**Reserves:** 296,501  
**Production:** 1,084

**Reserves:** 36,445  
**Production:** 273

**Total hydrocarbons reserves:** 332,946 • **rank:** 2  
**production:** 1,357 • **rank:** 6



**SHELL**  
**Nationality:** Denmark  
**Ownership:** Multinational  
**CEO:** P. Vosser  
**President:** J. Van der Seer  
**Turnover:** 484,489

 **Reserves:** 4,650  
**Production:** 645

 **Reserves:** 9,600  
**Production:** 529

**Total hydrocarbons reserves:** 14,250 • **rank:** 12  
**production:** 1,173 • **rank:** 8



**STATOIL**  
**Nationality:** Norway  
**Ownership:** State (67%); Folke-trygdfondet (3.26%); Bank of NY (2.5%); other private investors  
**CEO:** H. Lund  
**President:** S. Rennemo  
**Turnover:** 112,326

 **Reserves:** 2,214  
**Production:** 343

 **Reserves:** 3,212  
**Production:** 268

**Total hydrocarbons reserves:** 5,426 • **rank:** 18  
**production:** 611 • **rank:** 14



**NIOC**  
**Nationality:** Iran  
**Ownership:** State  
**CEO and President:** A. Galebani  
**Turnover:** 80,715

 **Reserves:** 151,821  
**Production:** 1,567

 **Reserves:** 218,302  
**Production:** 906

**Total hydrocarbons reserves:** 370,123 • **rank:** 1  
**production:** 2,473 • **rank:** 3



**SAUDI ARAMCO**  
**Nationality:** Saudi Arabia  
**Ownership:** State  
**CEO and President:** K. Al Falih  
**Turnover:** 402,600

 **Reserves:** 264,500  
**Production:** 3,653

 **Reserves:** 52,885  
**Production:** 554

**Total hydrocarbons reserves:** 317,385 • **rank:** 3  
**production:** 4206 • **rank:** 1



**ROSNEFT**  
**Nationality:** Russia  
**Ownership:** State (75%); LLC (9.5%); Sberbank(10%); private investors (4.5%)  
**CEO:** I. Sechin  
**President:** A. Nekipelov  
**Turnover:** 91,975

 **Reserves:** 18,351  
**Production:** 869

 **Reserves:** 5,607  
**Production:** 84

**Total hydrocarbons reserves:** 23,958 • **rank:** 10  
**production:** 953 • **rank:** 11

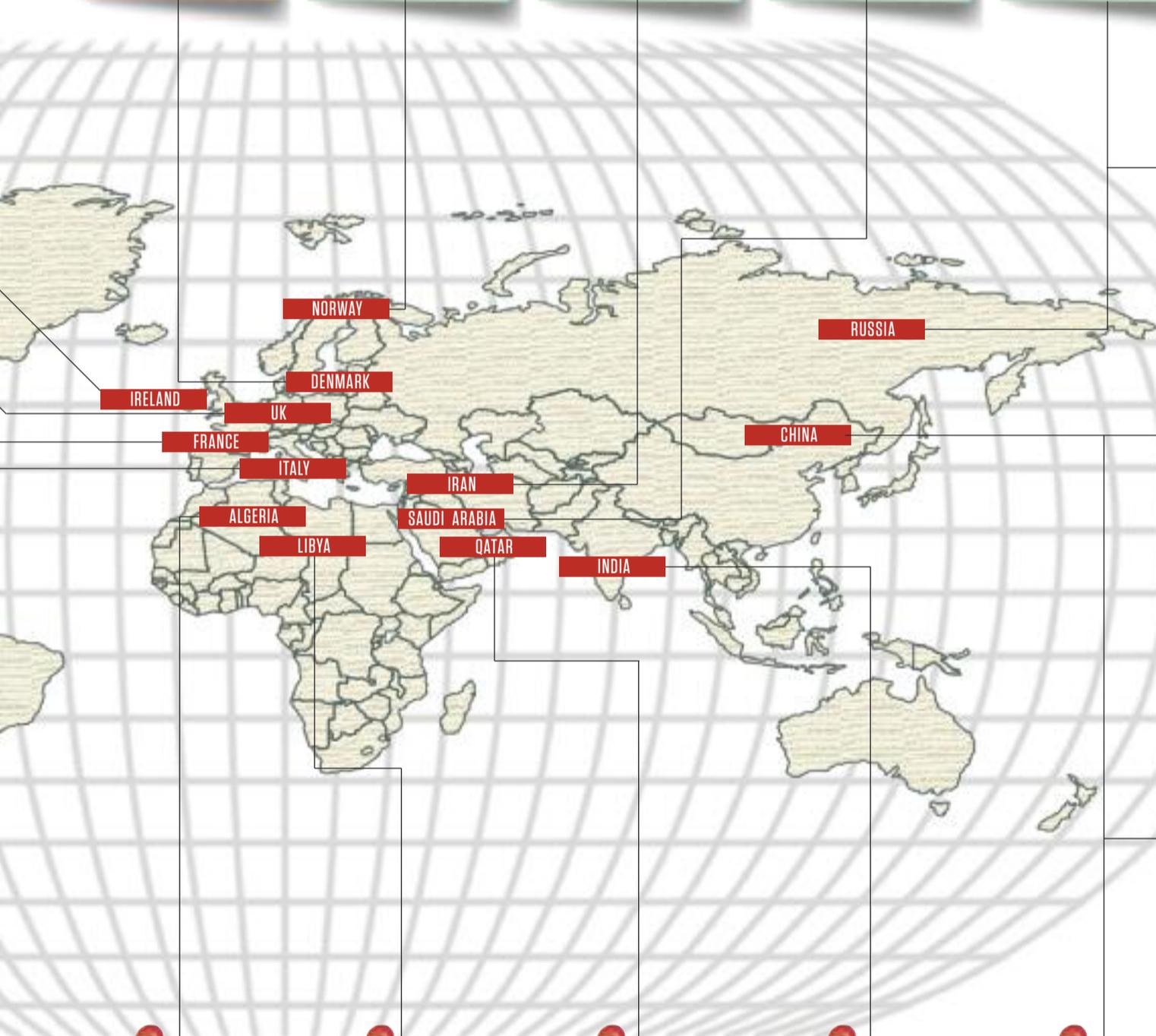


**GAZPROM**  
**Nationality:** Russia  
**Ownership:** State  
**CEO:** A. Miller  
**President:** V. Zubkov  
**Turnover:** 123,889

 **Reserves:** 5,284  
**Production:** 236

 **Reserves:** 26,199  
**Production:** 3,388

**Total hydrocarbons reserves:** 31,484 • **rank:** 8  
**production:** 3,621 • **rank:** 2




**CNOOC**  
**Nationality:** China  
**Ownership:** State  
**CEO and President:** L. Fanrong  
**Turnover:** 37,370

 **Reserves:** 1,916  
**Production:** 263

 **Reserves:** 1,209  
**Production:** 71

**Total hydrocarbons reserves:** 3,125 • **rank:** 22  
**production:** 334 • **rank:** 21



**SONATRACH**  
**Nationality:** Algeria  
**Ownership:** State  
**CEO and President:** A. Zerguine  
**Turnover:** 56,100

 **Reserves:** 11,300  
**Production:** 561

 **Reserves:** 29,721  
**Production:** 515

**Total hydrocarbons reserves:** 41,021 • **rank:** 6  
**production:** 1,076 • **rank:** 9



**LIBYA NOC**  
**Nationality:** Libya  
**Ownership:** State  
**CEO and President:** N. Berruien  
**Turnover:** 30,531

 **Reserves:** 32,960  
**Production:** 507

 **Reserves:** 7,460  
**Production:** 41

**Total hydrocarbons reserves:** 40,420 • **rank:** 7  
**production:** 548 • **rank:** 18



**QATAR PETROLEUM**  
**Nationality:** Qatar  
**Ownership:** State  
**CEO and President:** H. R. Al-Mohannadi  
**Turnover:** 56,564

 **Reserves:** 10,363  
**Production:** 469

 **Reserves:** 120,274  
**Production:** 478

**Total hydrocarbons reserves:** 130,637 • **rank:** 4  
**production:** 947 • **rank:** 12



**ONGC**  
**Nationality:** India  
**Ownership:** State  
**CEO and President:** S. Vasudeva  
**Turnover:** 14,811

 **Reserves:** 3,703  
**Production:** 243

 **Reserves:** 2,939  
**Production:** 183

**Total hydrocarbons reserves:** 6,642 • **rank:** 17  
**production:** 427 • **rank:** 18



**CNPC**  
**Nationality:** China  
**Ownership:** State  
**CEO:** J. Jiemin  
**President:** Z. Jiping  
**Turnover:** 34,516

 **Reserves:** 25,682  
**Production:** 1,037

 **Reserves:** 21,822  
**Production:** 547

**Total hydrocarbons reserves:** 47,504 • **rank:** 5  
**production:** 1,583 • **rank:** 5



**SINOPEC**  
**Nationality:** China  
**Ownership:** State (55%), HKSS (32%), others (13%)  
**CEO:** F. Chengyu  
**President:** W. Tianpu  
**Turnover:** 283,363

 **Reserves:** 2,889  
**Production:** 328

 **Reserves:** 1,210  
**Production:** 82

**Total hydrocarbons reserves:** 4,099 • **rank:** 19  
**production:** 410 • **rank:** 20

Industry expert **DAVID GOLDWYN** picks his energy winners and losers

# It all comes down to unc

point of view



Technology has opened up new horizons and increased reserves and potential output. Competition between national and international oil companies will depend on how they form partnerships

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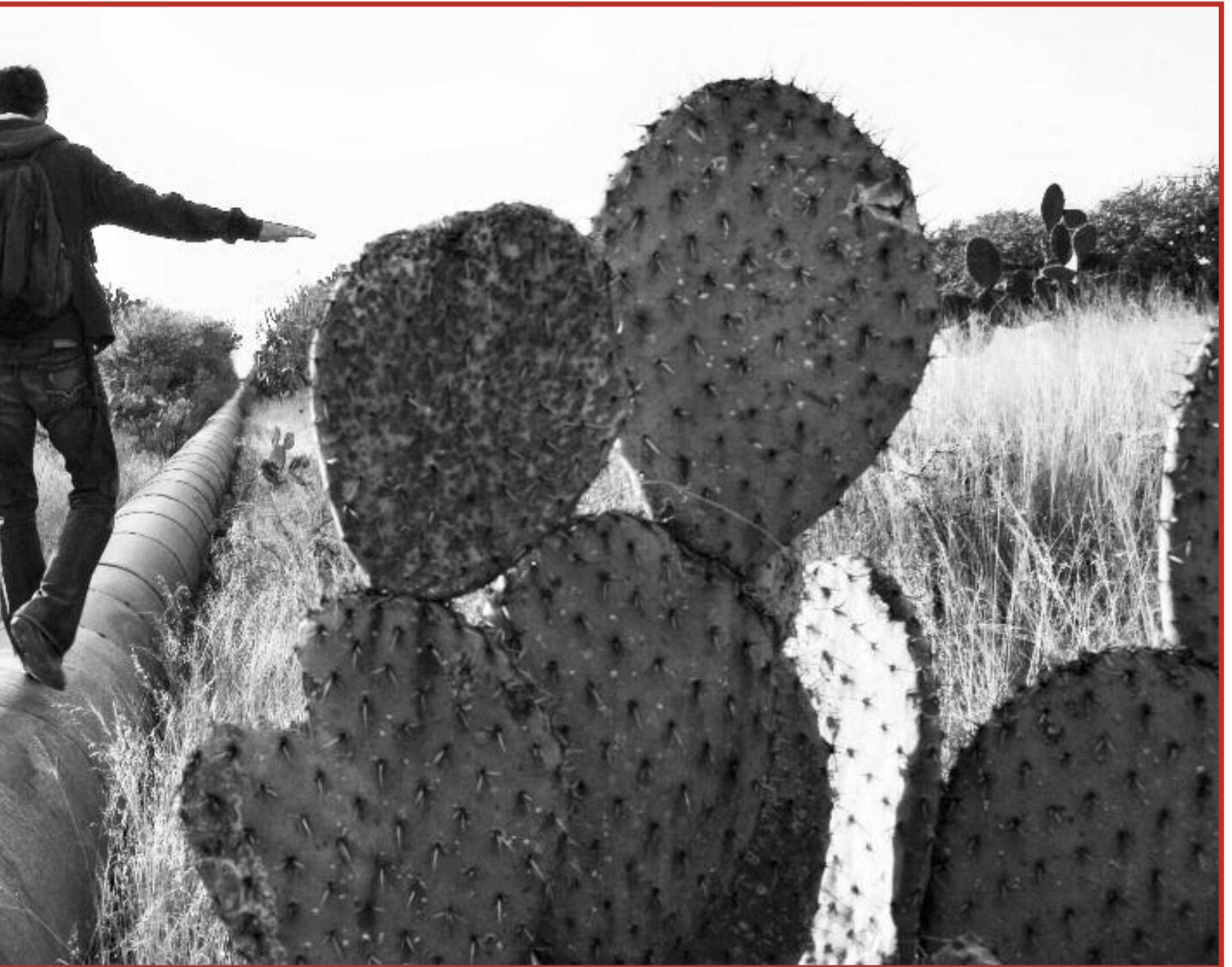
by MOLLY MOORE

Technology will be the crucial driver of change in the energy sector over the coming years, says David Goldwyn, president and founder of Goldwyn Global Strategies. In an interview granted to *Oil*, he told us about new opportunities in the oil and gas market and predicted some win-

ners and losers in the new scenario. The United States, Canada and Mexico, he says, will see their energy resources and development opportunities multiply, thanks to the discovery of large unconventional hydrocarbon reserves.

In fact, the major role of tight oil and gas in the development of the energy sector will favor international oil companies (IOCs), which have a significant competitive advantage over state-owned companies in terms of technology and project development.

# conventional resources



point of view

**What are the most important shifts you see for energy production and consuming markets in the coming decade or two?**

The greatest shift on the production side is the expansion of the global resource base due to the utility of hydraulic fracturing and horizontal drilling for tight oil and gas. The technology has now opened the western hemisphere and increased its reserve potential and production potential, which is a huge change. It also potentially opens western

Russia for tight oil, Eastern Europe for gas and China and South America for tight gas. So over the next two decades we have this potential increase in access for both of those hydrocarbon bases.

On the consumption side, the biggest shift will be that two-thirds of the growth demand for hydrocarbons, and for energy in general, will come from developing Asia.

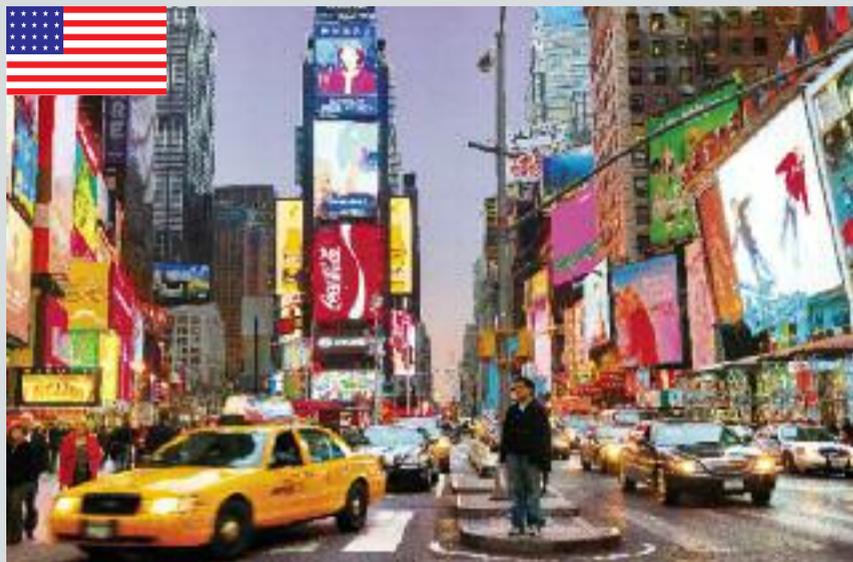
The second big change we are likely to see is transformation in transportation technology, as we see greater integration of hybrids and →



**David L. Goldwyn**

*David L. Goldwyn is President and founder of Goldwyn Global Strategies. He previously served as Secretary of State Hillary Clinton's Special Envoy and Coordinator for International Energy Affairs, Assistant Secretary of Energy for International Affairs, Counselor to the Secretary of Energy, National Security Deputy to the U.S. Permanent Representative to the United Nations, Chief of Staff to the Under Secretary of State for Political Affairs, and as an Attorney-Adviser in the Office of International Claims and Investment Disputes at the Department of State.*

WINNERS



The **UNITED STATES** could reach an output of 11 million barrels per day, if prices support it and if the country can find a social agreement on how to manage the environmental impact.



**CANADA** not only has oil sands, but also tight oil and tight gas formations. Thanks to unconventional fuels, the country has leaped up to third place in the league table of proven reserves, trailing only Saudi Arabia and Venezuela.

LOSERS



Middle East and North African countries will have to cut prices to retain market share, or risk ceding it to other countries. **QATAR** in particular will have significant competition on LNG.

electric vehicles and – hopefully – second-generation biofuels. By 2035 we will see very significant changes in the quantity of demand for hydrocarbons as well.

The third change on the consumption side will be the growing prevalence of distributed generation for modular nuclear reactors to mini grids which will provide electricity to a lot of the under-served population, but which will also increase the quantity of energy generated from either gas, in transportable forms, or renewable energy.

**Are you talking about a re-drawing of the world energy map over the next couple of decades?**

I wouldn't call it a re-drawing of the world energy map. The tight oil and gas formations are found in a lot of

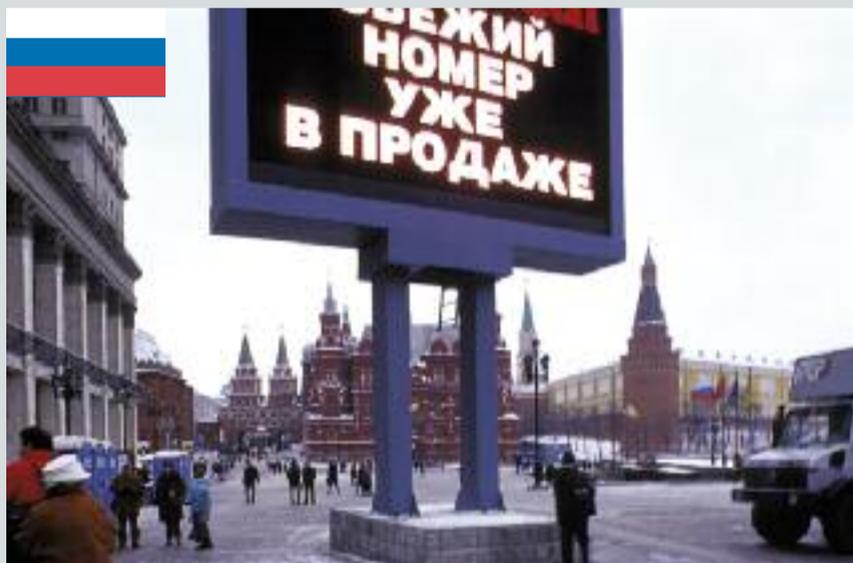
places where we have already seen more conventional formation of oil and gas or coal. What we are seeing is that the total resource base has grown enormously in all of those places.

What's significant is that the resource base has grown in areas where there is superb access for international investment, such as in the non-OPEC countries. Those are countries that we previously thought were significantly in decline.

We thought the United States was a mature resource base that was going to see growing imports. Now it turns out that we have not just the western Eagle Ford Formation, but also probably seven or eight smaller but very significant formations where we may be able to extract oil or gas.

The same is true in Mexico, which saw declining reserves for policy

QUESTION MARKS



**RUSSIA** has enormous resource potential but would require very significant changes to its fiscal policies in order to attract the technology investment needed to develop them.



**CHINA** has potential resources that are very complex to use, and under the current framework it is unlikely that foreign companies with the technology to develop its resources will be very interested in investing in the country.



**MEXICO** has a reserve that is the mirror image of the Eagle Ford Formation, so if it can establish a fiscal framework to attract investment it might even become a gas exporter.



**IRAQ's** opening to investment could make it a very significant oil producer over the next few years – but only if the shift is sustained: this uncertainty makes it a partial question mark.

reasons, but has always seen itself as relatively gas short. Well, Mexico has the mirror image of the Eagle Ford Formation, so if they can come up with the fiscal framework to attract investment, Mexico could not only be self-sufficient in gas and reduce its current LNG imports, but could potentially be an exporter of gas as well.

It's a policy question, not a resource question. That's what's new. China and Russia are two other examples. Russia, we know, has significant gas and oil resources, but in highly complex areas to extract. It turns out that Russia may be a very significant resource base for tight oil, if it can attract the technology investments.

And China has potential for tight gas, more than oil, from what we can infer. But China could also be far more self-sufficient in gas than we would have thought four years ago.

**Which countries will be the big winners and which will be the losers in the coming decades?**

I would draw the categories as big winners, big losers and big question marks.

The big winners on an economic basis are the U.S.; Canada – which, in addition to oil sands, has tight oil and tight gas formations; Mexico – which we've discussed; and Iraq. Iraq's opening to investment, if that's sustained – and that is a partial question mark – could make it a very significant oil producer over the next few years.

The big losers are likely to be Qatar, because it will have significant competition for LNG and for gas from other resources. The Middle East and northern African region, generally, because it will either have to settle for lower prices in order to sustain market share or it will have to cede market shares to other areas. The countries which are missing this

revolution are Venezuela and Bolivia which, in particular because of their fiscal frameworks, will see their potential markets for both oil and gas taken by other countries.

The big question marks here are Russia and China. Russia because it has enormous resource potential but would require very significant changes to its fiscal and tax policies in order to attract the technology investment needed to develop these resources. Russia's national champions can't do it on their own. That's a big change for Russia, and it's unclear they can do it.

China is the other big question mark because it has resource potential, but it's very complex and under the current framework it is unlikely that foreign companies with the technology to develop China's resources will be very interested in doing more

than learning about China's geological environment over the next few years. It is also very unlikely that the Chinese will figure out how to do these themselves within the next 15 years, given how long it has taken the U.S. to do this with far fewer infrastructure challenges.

**The IEA predicted the U.S. will become the largest producer around 2020, temporarily overtaking Saudi Arabia. What does that mean for relations between the U.S. and Saudi Arabia?**

It's possible can we get to 11 million barrels a day of production, if prices support that, and if we can reach a social agreement on how to manage the environmental impact of the development. The fact that the U.S. and Saudi Arabia may produce very large, but roughly equal, amounts of oil is significant economically, but not that significant geopolitically. The U.S. will consume all of what it produces, so we are not going to have an impact on the export market. Oil will still be a global commodity, priced globally, and therefore the U.S. will be as vulnerable to oil supply disruptions and price shocks as it is today. Therefore the role of Saudi Arabia being the swing producer – in either leading OPEC to cut supply to elevate prices or to provide spare capacity in the event of disruption – will still be essential. So we are still going to care about the Middle East. Even though the big demand centers will shift to Asia, we are still going to care about the stability of the region because all of our friends and allies will be relying on Middle Eastern oil and we're going to care who owns it and we're going to care whether it's disrupted or not, and we are going to care whether the Strait of Hormuz and other sea lanes are open to trade.

For the next 20 years the United

States is still going to care about the fate of those societies in the Middle East for reasons which extend far beyond oil. The U.S. will be very interested in those nations evolving in a friendly, stable, democratic fashion. We are going to care whether they are hosts to fundamentalist governments that may be hostile to our interests; we are going to care whether or not they produce on the gas and oil market.

**International oil companies are having to address increasing challenges from national oil companies. Where do you see this being most pronounced?**

The international oil companies now have a very significant advantage in areas where technology and project management are important. The IOCs will continue to dominate deepwater, unconventional and Arctic. For national oil companies, they are going to have to choose either to rely on conventional production or to find ways to partner with IOCs in order to develop those resources. This is why you see Russia suddenly opening up to partnerships – because of its interest in developing unconventional resources. This is why you are seeing no shift in prominence for the African national oil companies that cannot do deepwater on their own: they must rely on IOCs. Likewise in China, where only CNOOC has even attempted deepwater exploration, but has not yet been able to have any significant capacity in deepwater offshore China. They still need IOCs to lead development. And we see the same pattern in the new partnerships in China on development of unconventional resources. NOCs will lead on conventional development, but in the frontiers they will rely on the IOCs for some time to come.

I think the IOCs don't have a lot to fear from development of the new

The greatest shift on the production side is the expansion of the global resource base due to the utility of hydraulic fracturing and horizontal drilling for tight oil and gas

**MORE REFINERY PARTNERSHIPS**

**Heavy oil refineries require advanced technologies; collaboration between IOCs and NOCs, in this area, serves the interests of both parties.**

frontiers. Where the NOCs are able to dominate resources are in the conventional areas, such as Saudi Aramco, Korea National Oil Company and some of the others, where they have no need to share the rent with international oil companies.

The areas for competition between NOCs and IOCs will be how they form these partnerships, how they share control and how they share the rent from production over the next 20 years.

In some cases, such as Iraq right now, in the southern part of the country, you're seeing a proposition that attempted to bring in IOCs but which appears to be failing right now. You have other areas, in Eastern Europe in particular, where you have modest companies bringing IOCs in and you may be able to see significant growth.

It's in the traditional Middle East where there is going to be a battle between IOCs and NOCs for who's going to gain.

On the downstream side I think national oil companies may be able to dominate distribution of the oil, but the refining sector is going to be another area of partnership between IOCs and NOCs because the heavy oil refineries are very complex. Those technologies are owned by the IOCs and those are areas where partnerships seem to be in the interest of both parties.

**Where do you see wind, solar and other alternative energies becoming major players?**

We are going to see a very significant increase in the incorporation of solar technology into buildings and portable equipment. I think we have already seen wind become commercial without subsidies in many places. We will see that grow. Interestingly, I think we will see the largest growth in Europe because of the mandates they have for the share of renewable energy.

Second, we will see significant growth in China because they have the manufacturing capacity, the security imperative, and are internalizing the health costs of pollution from coal. So they have all the motivation in the world to grow those



industries and become exporters of those technologies.

The third area where we are going to see significant growth in renewables is going to be the Middle East and North Africa. I would say Saudi Arabia is particularly a country to watch because it now burns oil for electricity as many of its neighbors do. The value proposition for Middle East countries to pay the upfront capital costs of investment in solar technology, and then be able to increase exports without having to increase their production, is very dramatic. I think Saudi Arabia is dead serious about dramatic growth in solar technology for power generation because they can back oil out for solar or even gas if they are able to develop it with very significant financial gains.

Unfortunately this puts the United States last in terms of more dramatic growth in the volume – rather than just the percentage share – of renewables. The United States is going to have to wait for either a significant drop in the cost of these technologies, so they are competitive without subsidies, or some political miracle that produces a carbon tax, before we see very dramatic increases in the deployment of renewable energy for power generation.

The other shifts we will need to see

are improvements in electric storage and battery technology. That will be a ways off.

**Is there any point in the foreseeable future where renewable energy eats into the traditional oil and coal sources, or is the world just going to need so much more energy that that's never going to happen?**

The projections for energy demand, and common sense intuition that developing Asia is going to want what all developing societies want – mobility and electricity – forecast that there will be a great growth in the quantity of energy the world needs. The two big changes are going to be the utility of natural gas for electricity versus coal, and changes in the transportation paradigm. On the electricity side, this revolution in gas that we're seeing is going to make a significant dent in the share which coal provides for power generation in all parts of the world. Combined with a climate imperative, that's going to be a big shift in gas versus coal. Oil is not so much impacted by changes in feedstock for electricity, so I don't see those increases in solar and wind making a dent at all in the consumption of oil.

The big changes for oil will be the

changes in vehicle technology, as we see an increase in hybrid technology and smaller cars and – especially in developing Asia – a very different model for public transportation and mobility. We are very likely to see a very different transportation paradigm 20 years from now than the one which our nations have followed for the last 50 or 60 years.

That's going to make the biggest change on oil. We will see that while the population will grow and provide significant demand for the resource, it's going to be far less strategic 20 years from now than today because we will begin to see alternatives for vehicle transportation in a way which we don't have now.

Once you have those alternatives, whether it is a better hybrid or a short distance electric vehicle, or a biofuel-based vehicle or better forms of transportation – then you're going to see a change in demand for oil as well.

**Should oil companies be worried about the future, or optimistic on an economic and financial basis?**

Every company that called itself an oil company ten years ago is calling itself an energy company today. They look at the market out 20, 30, 40, or 50 years and still see a very significant demand for oil and gas and other feedstocks.

They know they are going to have a business, but they are starting to look more at demand. We will see a lot of companies looking at electricity as a business they may need to be in, and they are looking at biofuels as a resource they may want to be able to produce and distribute to the market. They are looking more at gas as they see the move towards electrification even in vehicles. They see oil as still the most efficient resource for providing a transportation fuel until something else comes along, and believe there will still be demand for that going forward. But it's going to need to be an all-of-the-above strategy for oil companies as energy companies of the future.

Molly Moore is a senior vice president of Sanderson Strategies Group, a Washington, D.C., media strategies firm, and a former *Washington Post* foreign correspondent. She has attended the last four U.N. climate change conferences, in Durban, Cancun, Copenhagen and Poznan.

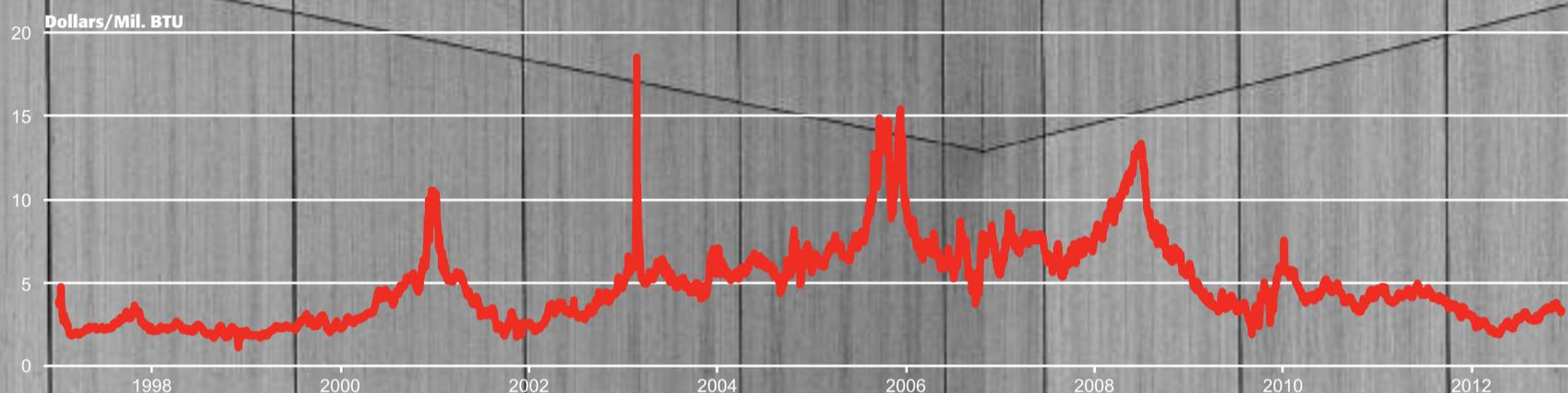


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The future of energy in the United States, according to **THOMAS F. DARDEN**

# The price challenge

The Quicksilver Chairman says that gas prices are set to oscillate between \$3.50 and \$5.50 for a decade. Companies will continue to consolidate. Tough times ahead with Obama at the Helm



In 2012, natural gas spot prices on the Henry Hub wavered between \$1.82 in April and \$3.77 in late November – a level deemed unsustainable by many producers.

point of view



**E**

xperts say that the United States will become the world's major gas and oil producer by 2035, with incredible opportunities available to companies like Quicksilver that work with shale gas – the driver of this revolution.

Thomas Darden, Quicksilver's chairman, shares this optimistic outlook. He

believes that natural gas prices will stabilize within a sustainable range for producers and that exporting liquefied natural gas (LNG) will not hurt the pockets of American consumers because it will be offset by an increase in extraction.

**What is your vision of the future**

**in the United States, in terms of energy?**

I am very optimistic. It's a genuine revelation that a technology developed in shale plays may actually lead to energy self-sufficiency for the United States.

We at Quicksilver are currently involved in two shale oil plays, and we are quite excited about them. Most of our peers are now exploring other shale oil plays, stemming from their technology development in gas shales. It's very exciting and hopefully it will lead to a less politicized world, and maybe a slightly more stable environment when it comes to energy policies. Certainly for the U.S. it should add to economic growth, which we're much in need of at this time.

**The price of natural gas in the United States is currently considered unsustainable. Even**

**though majors are continuing to produce in the hope that prices will rise again in future, many small companies can no longer afford it and are leaving the sector – in many cases shifting to shale oil. Do you think that trend will continue?**

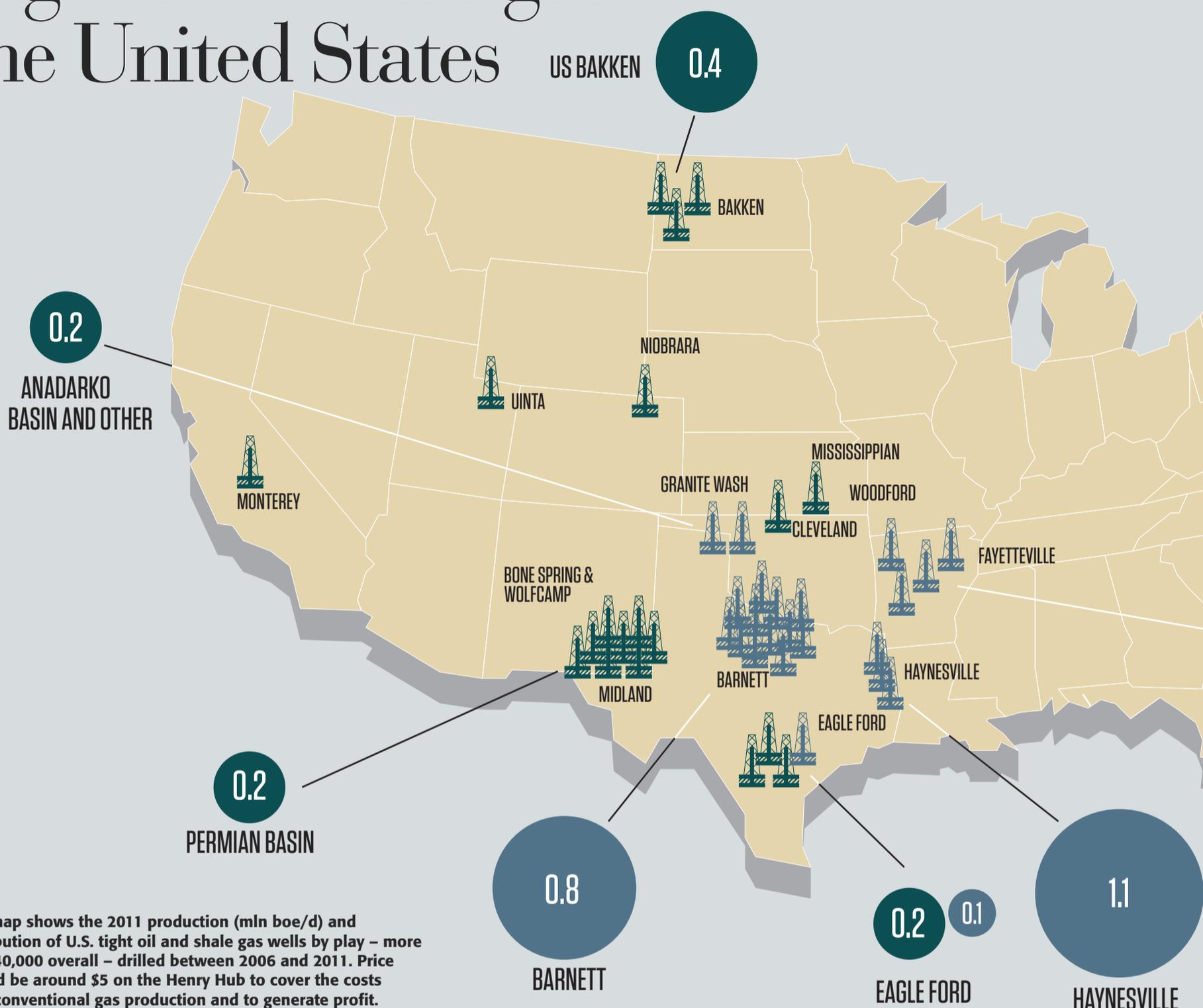
Well, it certainly is a challenging time. I believe that gas prices are going to stay in a very narrow range for the foreseeable future. I would think that band would be between \$3.50 and \$5.50 on the Henry Hub Index for a long time – a decade or more. At Quicksilver we are focused →



**Thomas F. Darden**

*Thomas F. Darden has served as Chairman of Quicksilver Resources Inc. since it became a public company in 1999. Mr. Darden was employed by Mercury Exploration Company from 1975 until 1999. He served as president of Mercury from 1992 to 1999. During his 24 years with Mercury, the company developed, acquired, and operated producing properties in Texas, Michigan, Indiana, Kentucky, Wyoming, Montana, New Mexico and Oklahoma. Mr. Darden also serves as President and CEO and a director for Quicksilver Gas Service GP LLC.*

# Tight oil & shale gas in the United States



on being a low-cost producer, which is really the best protection against this scenario. The situation will be long-term because our industry in the U.S. – and North America in general – is highly developed and the extent of potential production is vast. As prices begin to climb, the industry will go back to work and develop more supply, so I think we will always stay in equilibrium and around that price range.

**Developing shale plays seems to be very expensive. What kind of gas prices would cover the costs of production and generate profit?**

Certainly what we saw in the first half of the year – when prices fell to below \$2 – was not sustainable, and you saw drilling rigs being shut down

and production being cut. I believe a sustainable price is in the \$4.50-\$5 range on the Henry Hub. That's certainly what we see in our company as a sustainable price. As long as we have that kind of range, producers will continue to develop, albeit at a modest pace. It's actually better not to have prices spike too quickly.

**Quicksilver is looking for partners to develop some shale plays, in Canada and also in the Barnett. Is this part of the strategy to limit exposure to the current low price of natural gas?**

Working with partners is a part of our strategy, mostly because each of these shale plays is very capital-intensive to develop. A relatively small company like Quicksilver would quickly become financially

overstretched. Therefore, bringing in partners on each of our projects has been a focus for this year. Not long ago we announced an agreement with Shell on the Niobrara play in the Rocky Mountains.

We are currently looking for a partner in the Barnett, in Texas, and in the Horn River Basin in British Columbia, both to help de-lever the company and to provide a sustainable capital structure.

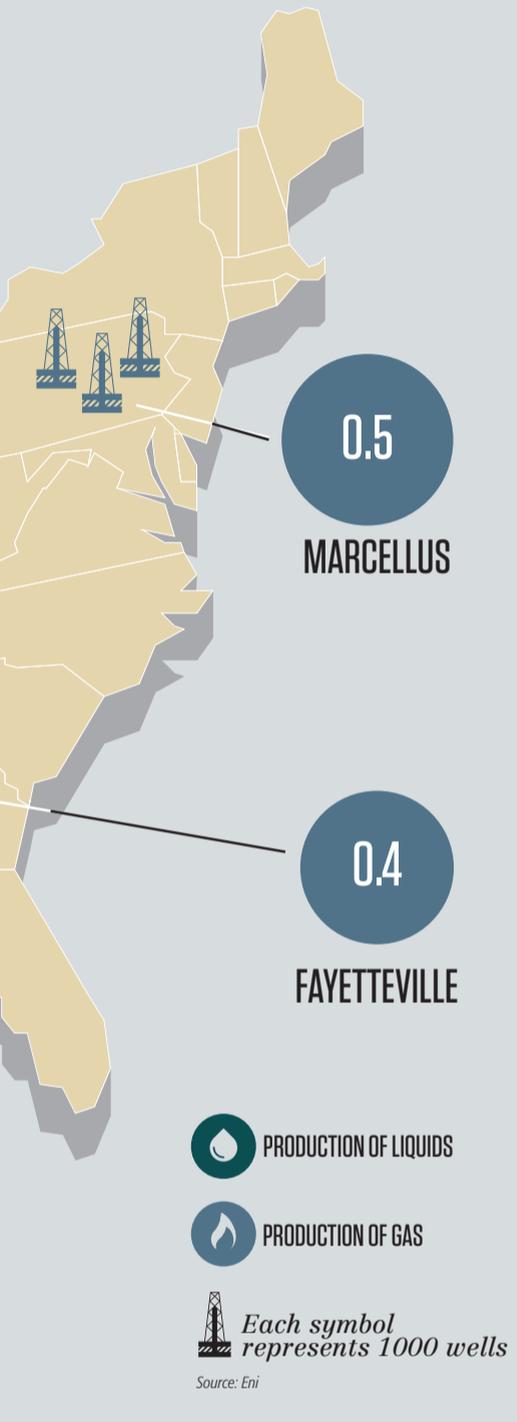
**Are you currently focusing on Colorado shale oil?**

In terms of generating cash flow, our focus is currently on shale oil plays because the price of gas, as we said, is low. The flipside, in this situation, is what buyers want, and so there is also a significant desire to export gas from North America. We foresee

major export opportunities, particularly from western Canada, which leads us to Horn River.

**Are gas prices having a negative effect on your financial results?**

Low prices have hurt the majority of small companies working in gas extraction in 2012. However, the gas reserves we have captured do not require rapid development because of the nature of our leases and the size of our units. There is no pressure for us. We've seen prices rebound in the last few months, which has put us back on a development path for both the Barnett and Horn River. One thing that makes us a more stable industry is the ability to hedge our product for longer periods of time. We are able to hedge gas production for three to five years



challenge. We know what it means to deal with low gas prices, while oil executives might understand a little less. I believe that with the increasing oil production in the U.S. we are going to see oil prices decline, at least in this country.

That will definitely be a challenge for oil companies. The fact that we might have low oil prices in this country – which might even become energy self-sufficient – will create pressure on other producing nations, since we are the largest consumer country.

**Do you see environmental sustainability as a challenge for energy companies? Doesn't the management of the water used in fracking create problems for shale producers in particular?**

There's no question that it is a challenge. The responsibility of energy companies to manage water in a conservative way is a top priority, and one of the biggest challenges the industry faces is in water re-use and recycling. Our industry uses higher chloride water which is not drinkable. I think the future will be all about lowering chloride levels. I do believe regulations on water usage are going to become even more stringent – and rightly so – to protect our water resources. We're absolutely in favor of protecting our water resources – it's our biggest focus.

More generally, there is the important issue of climate change. We at Quicksilver believe that gas companies themselves are the best short-term solution to reducing emissions and improving air quality. That is one of the unexpected benefits of the shale gas boom in the United States.

**There is also talk of a shale gas boom outside the U.S. Yet in some countries with proven reserves, water poses a challenge in terms of actually finding it – as in North Africa. Is this a realistic prospect?**

There is a very active debate over the feasibility of exporting fracking technologies to other areas – from North Africa, to China and Europe – where the problem is not just how to recycle used water; it is a question of finding water. As a matter of fact, we recently met with one of the largest industrial gas producing companies in the world, and spoke to them about using CO<sub>2</sub> to frack wells. This option currently on the table has a double advantage in that it could sequester CO<sub>2</sub> and save water. The problem is still the sustainability of the costs.

**Is the shale gas boom also changing the relationship between small independent companies and the energy majors?**

I think our relationship with Eni is a good example of cooperation, marrying our ability to move more

**Gas companies themselves are the best short-term solution to reducing emissions and improving air quality. That is one of the unexpected benefits of the shale gas boom in the United States**

wells to offset it and therefore minimize the impact on prices. Personally, I think a limited number of projects will be approved, but it is still permissible to export to countries that have entered into a free trade agreement with the U.S. Bearing in mind Canada as well, I think you may see significant gas volumes exported from North America by around 2018 to 2020.

**What are you expecting from Obama's second term with regard to energy policies?**

As you know, the conventional wisdom is that our industry would do poorly in a second Obama administration. There will be greater regulation and higher taxes for our industry. This will cause a reduction in the pace of development, and probably a higher price environment in the mid-term, by which I mean probably the upper end of the ranges we talked about. Higher taxes will lower development budgets and higher regulation will increase production costs. Regulation and taxation create barriers to entering the business, which from Quicksilver's perspective is an advantage because it reduces the number of potential competitors. It is unlikely that new companies will join the business. So, paradoxically, this Administration could be good news for our industry. Anyway, we will deal with whatever regulatory environment we have. We believe that best practices are not only critical for growth, but also for survival.

**The International Energy Agency has predicted that U.S. oil production could outpace Saudi Arabian output by 2020. What would be the impact on global supplies?**

First of all, I do foresee the possibility of energy self-sufficiency in the United States. Quicksilver will have its 50th anniversary in 2013, and I can say with clarity that in those 50 years we have never seen a time when this country was self-sufficient in energy. So I think this prediction is absolutely valid and in fact the potential of some of the plays may be underestimated.

efficiently into shale plays with the technical resources of a major. This is something that we see more and more as these shale plays are developed. For instance, Exxon bought XTO, which is a very efficient operator and is now in charge of all Exxon's shale plays. Like we said, unconventional plays are now so large in scale, with literally thousands of wells in each project, that it requires more than one company to develop it.

**The U.S. seems ready to export LNG, thanks to the shale gas revolution, and the Obama administration's approval of the Sabine Pass is a historic step in this direction. Do you think many other LNG export projects will get the green light?**

The current Administration has some crucial decisions ahead of it. There is one school of thought that if we export, prices will go up in this country. As an experienced person in this industry, I believe that output capacity will increase with exports, so the industry will drill additional

with relative certainty, and for up to ten years in some circumstances. We can hold onto reserves while we wait for higher prices.

**In the meantime, should we expect a further consolidation phase in the natural gas sector?**

I believe that consolidation is inevitable as prices come down. It's a part of the life cycle of our business. I think that even among larger independents you will see consolidation because of the sheer capital requirements of these large-scale shale oil and gas plays. So I think you will continue to see consolidation.

**What are the main short-term challenges for oil industry executives?**

Prices are always the main chal-



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Opportunities and challenges in the MENA region

# A growing presence

Perhaps contrary to expectations, IOCs are highly visible in the MENA region's upstream oil sector, with the sole exceptions of Saudi Arabia and Kuwait, where access to reserves is restricted

**T**he relationship between International Oil Companies (IOCs) and National Oil Companies (NOCs) receives special attention in the context of the Middle East and North Africa (MENA). This should come as no surprise given that a handful of NOCs in MENA control the bulk of world's oil reserves.

by **BASSAM FATTOUH**

There are concerns that if these NOCs do not undertake the necessary investment to increase capacity, forecasts of global oil supply may fall short of forecast demand, causing the oil price to increase to high levels to ration demand. While high prices generate high revenues for producers in the short term, they pose a significant challenge, as high and volatile oil prices can induce global economic slowdowns, reducing oil demand. In the long term, they can also cause demand destruction – a particular worry being the fear that high and volatile prices will accelerate current policies, aimed at substituting oil in the energy mix, which are driven by energy security considerations and the climate change agenda. These recent investment anxieties are very different from those prevailing in the 1980s and 1990s, when many MENA exporters had to manage excess capacity – induced by a slowdown in global oil demand and a rapid increase in supplies from outside the region.

**The anomaly of the small oil producing nations.** Some observers describe the IOC–NOC relationship in MENA as a 'paradox' given that 'the world's great international oil companies are playing a minimal role in the world's greatest oil challenge'.<sup>1</sup> Such statements convey the impression that the presence of foreign oil companies in MENA is marginal, and that oil companies face serious barriers to entry. However, contrary to this general belief, with the exception of Saudi Arabia and Kuwait which restrict the entry of foreign compa-



nies into upstream oil, foreign oil companies are highly visible in the region's upstream oil sector. Indeed, some small oil producing countries – Syria, Yemen, Egypt, and Sudan for example – are completely reliant on IOCs, independents, and Asian NOCs for exploration, production, and marketing. This group of countries has a rich and constantly evolving history of foreign company presence and leadership in their upstream sectors which extends for more than 30 years, indicating workable relationships between IOCs and the governments of these countries. This is quite remarkable given that for most of their modern history these

economies have been heavily dominated by the state; allowing private operators, not to mention foreign ones, into this strategic sector therefore represents an important anomaly. It is also interesting to note that these relationships have survived very extreme market conditions: the slack market and low oil price environment of the 1980s and the 1990s and the tight market conditions and high oil price environment of the last few years.

**Abu Dhabi and Oman.** In other MENA countries, such as Abu Dhabi and Oman, the political authorities did not pursue full nationalization,

and their governments maintained strong foreign involvement in their oil sector.

For instance, Abu Dhabi's national oil company (ADNOC) never acquired full control of oil operations, permitting IOCs to own up to 40 per cent of Abu Dhabi's upstream oil sector. Some observers explain this decision by the government's realization that the NOC could benefit from the advances in technology and depth of expertise that IOCs could offer.

The involvement of IOCs in the Omani oil sector has also been sizeable. Petroleum Development Company (PDO), Oman's biggest oil producer, is owned by the Omani government (60 per cent), Shell (34 per cent), Total (4 per cent), and Partex (2 per cent), a structure which has remained stable since 1977. In Oman, the challenge of reversing the decline in oil production, through the use of Enhanced Oil Recovery (EOR) measures, necessitated close cooperation with IOCs.

**Algeria and Qatar.** Some countries, such as Algeria and Qatar, pursued full nationalization in the mid-1970s, but have subsequently reversed their strategy, in favour of greater participation of foreign companies in the oil and gas sector. Qatar, in partnership with IOCs, embarked on a massive investment programme in the mid 1990s to develop its gas reserves, transforming Qatar into the world's leading LNG exporter. In Algeria, the fall in oil revenues in the 1980s, the sharp decline in the number of developed wells between 1980 and 1986, and the fall in oil output (from 1.27 mb/d in 1979 to around 1 mb/d in 1983) exposed the limitations of Sonatrach, the Algerian NOC, (in particular its ability to acquire the technology needed to combat declining output in mature fields) and forced the government to change its oil policy. As a result, the Algerian authorities had no option but to introduce a new hydrocarbon law and revise the fiscal terms, in an attempt to attract foreign investment into exploration, development, and enhanced recovery mechanisms. This resulted in the entry of diverse players into Algeria's oil sector, including Asian NOCs.

**Sanctions and the institutional framework.** Access to reserves, therefore, is not the most important barrier to foreign investment and greater participation of IOCs in most MENA countries. Sanctions – against Libya, Iraq, Iran, and Sudan – have limited the access to technology and foreign capital, and hampered increased participation of IOCs in major oil and gas plays. Another key factor affecting the degree and ease of access is the institutional framework governing relationships between IOCs, NOCs, and other institutions involved in the oil sector. In this respect, one source of tension between IOCs and NOCs is the fundamental difference in their objectives. As noted by Saudi Oil Minister Ali Al-Naimi:

*Some of the confusion regarding the role of the NOC emanates from unmerited benchmarking with IOCs. While the mandate of the latter is to create value to their shareholders, the NOC mandate is generally wider ... Saudi Aramco has been mandated by its shareholder to develop the hydrocarbon resources of the Kingdom to contribute to the development objectives of diversifying the economy and developing human resources.<sup>2</sup>*

NOCs are not of uniform quality. Some NOCs have played an operational role on their own, or side-to-side with IOCs, and have gained greater confidence in their capacity to develop their own resources. With the support of oil service companies, they have been able to tackle tasks that were not previously feasible. However, at the other end of the spectrum, many NOCs have, as yet, failed to acquire the necessary technology and management skills and have not operated independently of foreign oil companies. In countries such as Kuwait, and small producing countries such as Yemen, Egypt, and Syria, the relationship between the owner of the natural resource (the government) and the operator extracting the resource (the NOC) is highly inefficient, resulting in low rates of investment. In most MENA countries, NOCs do not determine the capital budget, and the decision on how much funding to divert into the oil and gas sector is usually subject to general government budgetary requirements. As a result, the capital budget for NOCs is often quite tight, preventing them from either undertaking new projects or upgrading human capital and technological capabilities. Consequently, some NOCs in MENA have suffered from losses in efficiency and competitiveness over the years.

**New business models.** Given their diversity, it is important that foreign oil companies fully understand the role and capability of NOCs in each MENA country, and to show clearly how they can contribute to each NOC's development. Some IOCs have not fully recognized these changed circumstances, and have not ade-

If NOCs do not undertake the necessary investment to increase capacity, global oil supply may fall short of demand, causing the price to increase

quately explored new forms of engagement with some of the strong NOCs. These changes require that IOCs develop new business development models that better fit the strategic objectives of NOCs. But IOCs may not have the flexibility to adapt to this new reality. Under pressure from shareholders and financial investors, the financial and investment strategies of IOCs have tended to move towards maximizing shareholder value. Unlike the position of the early 1980s, when the bulk of cash flow was invested in exploration, development, production, and technology development, IOCs have shifted towards returning large cash flows to shareholders through buyback schemes and dividends. Many have engaged in mergers and acquisitions, in order to improve their profitability through cutting costs. Maximizing shareholder value has also led to a gradual shift from the vertically integrated structure that characterized the oil industry in the 1960s and 1970s. Instead, various parts of the supply chain are now treated as independent profit centres, with investment being

diverted from relatively low profit centres, such as refining or marketing, towards more profitable areas such as the upstream sector.

#### Service companies and Asian NOCs.

This has produced opportunities for service companies to get involved and offer to take on some of the tasks that IOCs are reluctant to perform. IOCs also face tough competition from Asian NOCs. In meeting their domestic energy needs, NOCs in China and India have been active in increasing their international investments and in acquiring assets to secure new sources of supply. Since these NOCs are not solely driven by the objective of maximizing shareholder value, they are likely to be flexible in negotiating contracts with governments of oil-exporting countries. They also benefit from state-to-state connections and thus get better access, on the basis of a more general agreement between governments. Part of their success has been their willingness to operate in sanctioned countries, and to undertake large-scale infrastructure projects – such as roads, schools,

and hospitals – that support their energy investments.

Tougher competition from multiple players and changes in the landscape facing IOCs and NOCs do not imply that the involvement of IOCs in Middle East oil and gas will decline in the future. The maturity of producing basins will induce MENA governments to develop a twin-track production and exploration strategy. The first track concerns the discovery and development of new oil and gas fields and basins, to expand productive capacity. The second track aims to improve the recovery factors of producing fields, in order to reduce decline rates. This strategy requires the application of new technologies, more and better engineering, the adoption of best-practice techniques, and greater managerial discipline. Managerial capability can be an important obstacle if bureaucratic rules of the public sector type hinder efficient performance. The challenges are not minor and many NOCs in MENA are not well prepared for the task of designing and implementing these types of projects. This may create opportunities for IOCs to step in and increase their presence in a key region. Their success, however, will depend on their ability to develop new business models that better fit the strategic and socio-economic objectives of NOCs.



**THE AUTHOR.** Bassam Fattouh is Senior Researcher and Director of the Oil and Middle East Programme of the Oxford Institute for Energy Studies, an independent center for research into the social sciences areas of energy issues. The research conducted by Fattouh focuses on the international system that governs oil prices. He pays particular attention to aspects such as the relationship between the futures market and the spot market, the relationship between OPEC and the market, the causes of volatility in oil prices, and the dynamics underlying differentials in the price of crude. Fattouh also studies the relationship between national and international oil companies, as well as its implications in terms of investment behavior. In addition, he has a profound knowledge of the economic context of the Middle East.



Saudi Arabian Oil Minister  
Ali Al-Naimi.

<sup>1</sup> Michael Daly, 'The paradox of international oil companies and Middle East oil', CERA Conference Istanbul, June 2005

[http://www.bp.com/liveassets/bp\\_internet/globalbp/STAGING/global\\_assets/downloads/C/cera\\_conf\\_paper\\_istanbul\\_june2005.pdf](http://www.bp.com/liveassets/bp_internet/globalbp/STAGING/global_assets/downloads/C/cera_conf_paper_istanbul_june2005.pdf)

<sup>2</sup> Ali Al-Naimi, 'The Growing Role of National Oil Companies in Saudi Arabia', World Energy, Vol.7, No.4,

[http://www.worldenergysource.com/articles/text/alnaimi\\_WE\\_v7n4.cfm](http://www.worldenergysource.com/articles/text/alnaimi_WE_v7n4.cfm)



A look at Qatar from Nasser Al-Jaidah, CEO of Qatar Petroleum International

# Natural gas and diplomatic skill

Thanks to cooperation between national and international energy companies, in one decade Qatar has become a major player on the world stage

**I**n the eyes of the world, Qatar is one of the emerging powers in the new Middle East. This small Gulf state – which has less than two million inhabitants, but a per capita GDP that *Forbes* said exceeded \$88,000 in 2010<sup>1</sup> – is gaining increasing influence with its foreign policy, from Syria to Libya

and Palestine to Afghanistan. The Qatari-broadcast satellite TV channel Al Jazeera, as everyone knows, was one of the champions of the recent revolution in the Arab world, while the fact that the country will host the soccer World Cup in 2022 is further confirmation of its growing importance. But the economic power of the emirate extends well beyond the “Greater Middle East.”

Doha’s innovative foreign policy and political direction arise from the skill of its sovereign, the Emir Hamad bin

Khalifa Al-Thani, nicknamed “the Arabic Kissinger,” who has ruled since 1995. His diplomacy has been perfectly in step with the country’s goal of reorganizing its energy policy, making a priority of gas instead of oil.

**The 1980s oil crisis.** In truth, however, the roots of this trend extend back to at least the 1980s, and the decision was influenced both by economic factors and foreign policy calculations. During the 1980s and 1990s, under the emirate of Hamad’s father, the country’s oil revenues fell drastically, creating significant problems for the state, whose generous welfare systems depend to a large extent on oil resources. In 1982-83, this oil crisis threatened the foundations of Qatar’s social contract: oil alone was no longer enough. Moreover, between 1980 and 1988, as the Iraq-Iran conflict raged, the country realized it could no longer count solely on Saudi Arabia for security. Accordingly, following its neighbor’s example, it set itself up as “the Saudi Arabia of liquefied natural gas (LNG),”<sup>2</sup> thereby becoming an essen-

tial point of reference for Western energy demand.

As a result, in 1997, two years after the new emir took power, Qatar dedicated itself to producing LNG, and it is now the main global supplier and a leading member of the Gas Exporting Countries Forum (GECF), based in Doha. The country’s enormous gas resources are concentrated in the North Oil Field – the largest reserve of non-associated gas in the world, located off the peninsula’s northeast region. Total accessible reserves in the formation are calculated to be more than 10,760 billion cubic meters, while the total amount of gas could be up to 14,150 billion cubic meters. The North Field covers an area of 6,000 square kilometers and is split across Qatari and Iranian waters, with Qatar’s half located close to the Iranian South Pars field. In terms of natural gas reserves, Qatar is third in the global rankings with 25,201 billion cubic meters, behind Russia (46,000) and Iran (33,090). It is also the world’s third biggest producer of natural gas, with 160.73 billion cubic meters; in this

it trails Russia (663.55) and the United States (637.72). In terms of the reserve/production ratio, though, Qatar is in second place (at 157 years), beaten only by Iran (220 years). The country consumes 28.21 billion cubic meters per year, with a per capita consumption that is – as you might expect – among the highest in the world at 16,475 cubic meters. Qatar is also second in the world in production/consumption ratio – at 5.7; Norway, the leader, is at 14.93 – and in natural gas exports – at 126.34 billion cubic meters; Russia, the leader, is at 191.81 billion. The country also boasts massive liquefaction capacity, reaching 103.3 billion cubic meters.<sup>3</sup> In addition, as an OPEC member state, Qatar is also an important oil producer. The statistics speak for themselves: 25,380 million barrels in 2011 (compared to 15,210 million in 2008), and 1,924,000 barrels per day of crude, unconventional oil and LNG at an oil reserves/production ratio of 36 years. In 2011, oil consumption totaled 191,000 barrels per day, or 40.81 barrels per capita – inferior to

## OIL

Reserves: **25,380**  
(millions of barrels as of December 31)

Production **1,924**  
(thousands of barrels/day)

Export: **1,451**  
(thousands of barrels/day)

## GAS

Reserves: **25,201**  
(billions of cubic meters  
as of December 31)

Production **160.73**  
(billions of cubic meters)

Export: **126.34**  
(billions of cubic meters)

which is based on greater population growth and increased energy intensity per person in those regions. The petroleum industry will have to develop more resources, so we will definitely need cooperation between IOCs and NOCs. And this cooperation is really crucial, now more than ever before, so that resources can be mutually beneficial. The shift to unconventional resources and the share of the hydrocarbon portfolio that is controlled by national oil companies has increased as they have taken active roles.

International oil companies are now well-positioned to cooperate with the national oil companies on this newly-discovered resource – unconventional oil. For unconventional gas reservoirs – like tight gas, shale gas and coal-bed methane – the true industry leaders are really the independents and the service companies, which help to develop the technology needed for drilling.

They also work on well completion in unconventional gas activities and, of course, on hydraulics for oil reservoirs and horizontal drilling. Many of the IOCs who have come to be thought of as latecomers were actually the pioneers. Essentially, in the last couple of decades it has been independents and the service companies, and then the IOCs, who invested in tight as well as shale gas, especially in the United States.

What is the potential for cooperation between IOCs and service companies? This is, of course, part of the technology transfer process.

Without doubt, increased financial capabilities can provide national oil companies with a large amount of up-front capital for unconventional resources, as well as access to markets and infrastructure. The NOCs' growing financial capabilities can ensure the necessary initial capital for unconventional resources, as well as access to the market and the infrastructure needed to optimize returns and growth.

In addition, these funds can also assist in the systematic and consistent management of oil production growth, depending on whether states see those twin measures as being in the national interest.

Do IOCs have a competitive advantage? They are very strong, of course, and they have competitive advantage on project management and risk management capabilities, and on access to technology, capital and the downstream market. They also have real power to define the markets for a new product.

When oil began to flow out of Kazakhstan, Russia and European markets, for example, the IOCs were instrumental in creating the blended crude specifications. But there are other industrial players who can really make a contribution in this regard, such as service companies, which are often asking NOCs to work with them.

So, what are the benefits of IOC/NOC cooperation right now?

IOCs' access to low-cost capital can be really beneficial, while access to low-cost infrastructure, synergies and enhanced markets are of course very important. NOCs have access to technology, access to learning-curve effects in the oil sector and value-generation through the optimization of subsidized resources, and – of course – access to growth, as in the case of Qatar. Now, if we combine these factors, the result is an effective partnership with IOCs and a certain discipline, and also controlled investments by NOCs in unconventional resources.

Just to give you an idea of where we stand in Qatar, the country is now uniquely positioned for distribution and to participate, with IOCs, in partnerships like the ones I have mentioned, and also to benefit from a combination of historical partnerships and important supply infrastructure and market arbitrage. To sum up, during the next few years – or really the next few decades – the global petroleum industry will be transitioning from producing oil and gas mainly from conventional reservoirs, to the development of more unconventional resources.

For this to happen, tens of thousands of wells will have to be drilled in order to get access to large unconventional fields. To meet this massive target, there will have to be a role for both international and national oil companies, and services companies. All of them will have to team up and work together to play their natural role in developing these reservoirs and hence meet growing global oil and gas demand. Of course, they will have to overcome the related challenges of getting access to resources, expertise and technology, while also meeting market and capital requirements. ”

Extracts from a speech given at Oil & Money 2012 in London

that of Kuwait (45.93) but ahead of Saudi Arabia (36.64) and the United Arab Emirates (28.12).

**A rising star.** Given its abundant resources and the diplomatic skill of its head of state, Qatar can be seen as a rising star that is destined to become a key player on the world stage in the coming decades. This is partly due to the strategy pursued by Qatar's national energy companies, which is rooted in cooperation with international companies. Nasser Al-Jaidah, Chief Executive Officer of Qatar Petroleum International, delved into the impact of unconventional oil and gas on relations between IOCs and NOCs during his speech at the Oil & Money 2012 conference in London.

1 Beth Greenfield, "The World's Richest Countries", *Forbes*, February 22, 2012

2 Justin Dargin, "Qatar's Natural Gas: The Foreign-Policy Driver," *Middle East Policy*, Vol. XIV, No. 3, Autumn 2007.

3 These figures refer to 2011, unless otherwise stated, and are quoted in Eni's *World Oil and Gas Review 2012*.

## “ From confrontation to cooperation

**T**he time has come for cooperation, not confrontation, between IOCs and NOCs. In Qatar, I think we have proven this point very clearly through cooperation between IOCs and NOCs, which has made the country one of the major players in energy over the last decade.

We firmly believe in this strong partnership, which has been translated into reality in the last two years, and we are really thinking about the spirit of what we're going to do and be in the future.

We are expecting global gas demand to grow – at times very robustly. So far we have talked about 40 percent growth by 2025, led of course by demand in developing countries,



**NASSER AL-JAIDAH** is chief executive and a board member of Qatar Petroleum International, board member of Qatar Petroleum and board member of Industries Qatar.

Moscow's turning point, explained by Russian economist

**SERGEY AGIBALOV**

# Time to change

Russia is ready to face the global energy market's new challenges with an increasing receptiveness to the international majors and to foreign capital. Investing in research and development will remain crucial

point of view



## **Sergey Agibalov**

*Sergey Agibalov has been with the Institute for Energy and Finance (IEF) since July 2006 and is its main economics and energy specialist on the CIS region. His professional interests include analyzing Russia's foreign and economic activities and the energy sector. Agibalov graduated from Lomonosov Moscow State University's Geology Department with a degree in Geophysics in 2004. He worked as an intern in Tunis in 2001 for the oil service company Schlumberger and at the University of Bremen's Earth Science Department in 2003.*

**I**n Russia, there is a changing mentality and a more open attitude to new markets, as well as collaboration with international oil companies, increasingly green energy, and an ever more central role for gas, deemed "the perfect choice for the coming decades." The country looks set to tack-

le new challenges in the energy sector, with significant investment on the horizon. Russian companies must invest more, though, if they want to be competitive on an international scale; and they can take some help where necessary from the international oil majors. Sergey Agibalov, Senior Expert at the Department of Economics of the Institute for Energy and Finance, Moscow, outlines the current energy situation and future prospects for his country.

**What is the relationship between national companies**

by **DANIELLE DERN**



**and international majors, and what will it be like in the near future? Will there be only fierce competition, or could they grow closer?**

From what we have seen so far, the corporate structure in Russia consists mainly of Russian companies – some of them government ones, some of them private – but most of the resources are developed by Russian companies.

Recently, though, there has been a growing openness to business, foreign capital and foreign companies,

and the most important examples are the cross-network deals with international majors such as Exxon-Mobil.

**And such as BP?**

And such as BP and others; and previously with Exxon, for indirect development in different regions. So it seems there is a trend toward opening the Russian market and going abroad, together with foreign majors. And of course there also is the equally significant issue of development of Russia's Arctic region.

There is no doubt that there is a real need for advanced technology to develop these resources, so we can expect a further increase in cooperation with international majors in the Arctic.

**What are Russia's prospects in terms of geological exploration and extracting oil from Arctic areas?**

The main trend is that the resources are going to cost more and more money, so we will see a continuous increase in spending. Even though we will see some changes here, at the same time we feel that the price of oil and gas is still rather high, so it's possible to start a new project in the Arctic region.

We can say the era of cheap oil and gas is coming an end in Russia, because the majority of oil and gas today comes from old oil and gas oil fields that have been producing since Soviet times, when the investments were made. But now companies are ready to invest more and more, and a high price level will definitely support investment.

So of course we see some challenges, and that's the reason that Russian companies should spend more on research and development if they want to be competitive in the international markets – and not only to support market share in Russia. As we said before, there is a strong need for international participation in some areas for the development of new resources.

**What kind of market policy is Russia pursuing in order to retain its dominant position in Europe?**

First of all we should say that Russia is a provider of global energy security and energy security for Europe, and our main aim is to support this position and to support the growth of the global economy with Russian energy resources.

Russia believes that gas, in particular, is the perfect choice for the coming decades. Russian companies and officials think it's quite important to really understand the whole process of using gas as a fuel, in terms of low carbon emissions, low investment cost and so on. We should also keep an open mind and not narrow our mentality through choices dictated mainly by political matters.

The development of renewable energy sources is important, but we should measure the real benefits and real costs of these green energies. Gas, we think, is good in environmental terms and actually rather cheap in economic terms, which is also very important. For instance, in Europe, you could invest more in gas and spend extra money on other economic priorities like combating unemployment.

Another important issue is a constructive, productive dialogue between the Russian government, Russian companies, the European

To date, most energy resources in Russia have been developed by national companies. But a recent trend of growing openness to business, foreign capital and foreign companies is starting to emerge – the most important example of which is cross-network deals with international majors

Union, the European Commission and European companies. We can have different views, but should understand each other's positions. Russia is a major supplier of energy for the E.U. and, of course, there should be a balance of interests between the supplier and provider, with decisions that benefit everyone involved.

We need far-sighted plans, and the development of this E.U.-Russia dialogue should be seen as a really important step, so we think that we should just promote this. →

Russia is a major supplier of energy for the E.U. and, of course, there should be a balance of interests between the supplier and provider, with decisions that benefit everyone involved. We need far-sighted plans, and the development of this E.U.-Russia dialogue is a really important step

Of course, all these developments will influence the whole world, and shale gas will be particularly important in China, Australia, Ukraine or in other regions. For sure, it will be an important piece of the whole puzzle. We believe that the development could be really positive for the whole gas market, because we expect some changes in gas pricing, in line with the development and increase of gas sales around the world, through LNG and new pipelines. So we expect there will be some changes, and maybe a decrease in the price of gas, which in turn will stimulate more consumption of gas; so all parties will benefit from this situation, including conventional and unconventional suppliers. It's better for the whole industry.

**What role do you see for renewable energies in the sector, overall? Do you think the use of solar energy, for example, could restrict or slow gas demand in Europe? Could it even halt demand?**

We should say that there is a certain place for renewable energy in the overall balance, so there is a kind of natural limit for renewable sources. For instance, we have really good prospects for solar energy in some areas of Spain, but much less so in Germany and other countries. However, if we have a situation with heavy subsidies from the government for renewable sources, we can see that there will be really big changes that will translate into a some kind of distortion of the market. For instance, imagine you can install any type of renewable resources wherever you want, which might not even be worthwhile in terms of the presence of these sources, but if there are heavy subsidies for these renewables you will still benefit.

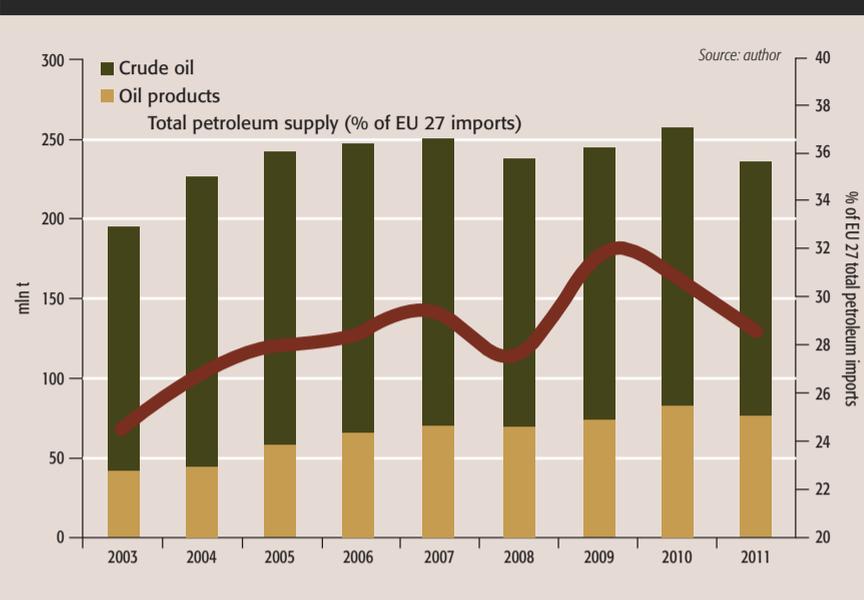
This, of course, is a rather strange situation: available space and financial resources do not justify senseless development. In an area with strong winds, of course there is some sense in putting in wind turbines. But in the case of moderate winds, there is rather little economic and environmental sense in it. In any case, you need to look at the local situation. For instance, in Germany the load factor of wind power was 18 percent in 2011, which simply means that wind turbines didn't operate almost 300 days out of 365. And it's always a question of the scale of the project: if you want to supply big cities with lots of energy, of course you need conventional power. But this conventional power should be greener, cleaner, safer and so on.

One solution could be to use gas or even coal – as long as it is clean coal – but if you want to supply a big city using just wind turbines, then you would need to put wind turbines everywhere, and that looks really absurd.

**The European Parliament agreed recently that shale gas can be beneficial for energy security. What do you think of this resource? Do you believe it can be a valid alternative to oil in the future?**

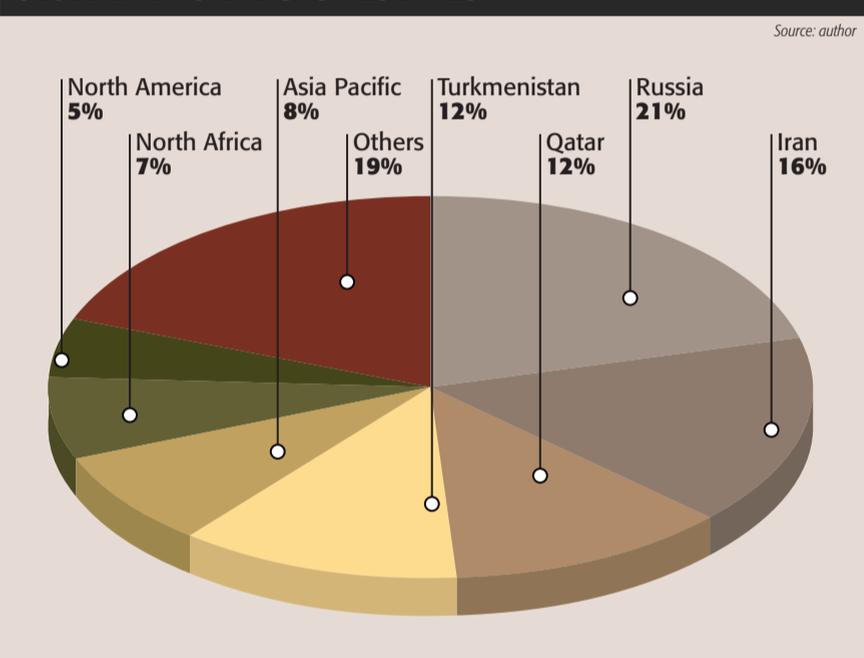
I definitely think that shale gas is a really important factor in the international gas market. So far it's mainly localized in North America, but it influences the global market in any case. As far as we can see, the United States will become exporters of gas and there will be some inevitable changes in the energy balance inside the U.S., in favor of cheaper gas.

**RUSSIAN OIL IN THE 27 E.U. COUNTRIES**



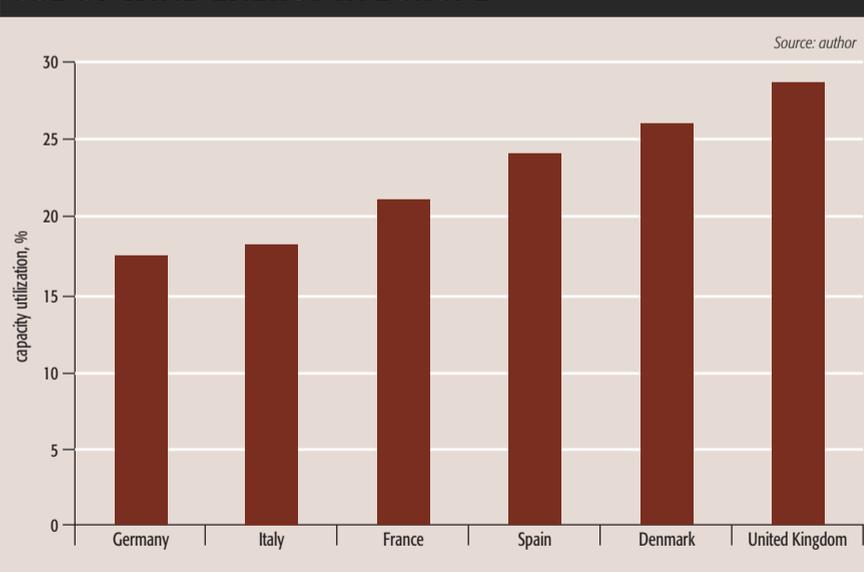
The curving line shows the percentage of Russian gas imported by the 27 European Union countries. The Federation is a major European energy supplier, accounting for 29 percent of energy imports in 2011.

**GLOBAL NATURAL GAS RESERVES**



The Russia federation is still the state with the greatest slice (21 percent) of the total global proven reserves of natural gas. But most of these come from old fields in use since Soviet times.

**USE OF WIND ENERGY IN EUROPE**



Average wind energy usage capacity between 2009 and 2011 in the main European countries. Despite having the highest megawatt capacity, Germany has the lowest wind energy usage coefficient of these countries (17.5 percent).

Looking at new markets for hydrocarbon extraction and sales

# The foreign campaign of the Russian giants

The acquisition of TNK-BP by Rosneft and the reorganization of Gazprom's overseas activities are reshuffling the international scene. On the domestic front, competition between companies is extremely fierce



point of view

# T

by **EVGENY  
UTKIN**

The big news of 2012 was the transfer of TNK-BP, which was sold by BP and its Russian partner, AAR, to Rosneft, the Russian state-owned company headed by Igor Sechin. After finalization in 2013, it is clear that with this operation, Rosneft will become the world's biggest listed oil pro-

ducer and will be looking to expand not only (as is natural) in Russia, but also abroad. The conflict between the Russian/English partners in TNK-BP was settled in the most elegant manner possible – TNK-BP was sold in its entirety, to the delight of all concerned, for a substantial sum: almost \$60 billion was paid to the company, which has no liquidity problems or political headaches in Russia.

**Governance and access to new technologies.** In addition to a substantial

sum of money, BP will have 20 percent of Rosneft, which allows it to place two directors on the board (of a total of nine), and to count on steady profits and dividends. For its part, Rosneft will be able to rely on its second-largest foreign partner, other than the government, and it hopes that this “privatization” will help it in terms of both governance and access to new technologies held by BP. But even without this important agreement, Rosneft is eyeing the whole world, from east to west. In September 2012, within the National

Oil Consortium (which includes the Russian companies Rosneft, Gazprom Neft, Lukoil, TNK-BP and Surgutneftegaz), and together with Petroleos de Venezuela SA (PdVSA), it extracted the first oil from the Junin-6 block in Venezuela, and established a joint venture with PdVSA for the development of Carabobo-2. In 2010, Rosneft acquired 50 percent of the German refinery company Ruhr Oel GmbH, and on December 4, 2012, Igor Sechin spoke with the Chinese Vice Premier, Wang Qishan, about the possibility of an inter-go-

**\$60 BILLION**

the sum that Rosneft will pay to acquire 100 percent of TNK-BP from BP and Russian partners AAR

**20 PERCENT**

the share of Rosneft that will pass to BP following the agreement for the sale of TNK-BP

**€17.6 BILLION**

the value of E.ON's contract with Novatek for the supply of gas over the next 15 years

**550 MILLION m<sup>3</sup>**

the daily volume of gas that Gazprom carried to Europe over the winter

**12 BILLION m<sup>3</sup>**

the gas that Rosneft extracts over the space of a year, which is trending upward

## The Russian Arctic offshore

At present, only two state-owned companies, Gazprom and Rosneft, are able to develop the Russian Arctic offshore. Gazprom has committed itself to the Shtokman project, which it regards as strategic, and is pressing ahead (albeit at a slower pace). Early 2013 will see the launch of the delicate process of construction of the LNG production plant. In 2012, Rosneft signed strategic agreements with ExxonMobil, Eni and Statoil for the exploration of offshore areas and the creation of joint ventures (66.7 percent for Rosneft, 33.3 percent for the foreign company), as well as an exchange of technologies between the companies.



vernmental agreement to speed up the construction and commissioning of a petrochemical and refinery plant as part of a joint initiative in Tianjin (the Chinese-Russian Eastern Petrochemical Company project). A few days later, on December 18, Rosneft and the Italian company Saras signed an agreement for a joint venture, with the aim of capitalizing on their respective potentialities in the upstream and downstream segments, drawing strength from Rosneft's privileged position in terms of access to supplies

of crude and other petroleum products, and from Saras' Sarroch refinery in terms of processing and trading opportunities. It is clear that Rosneft aims to become a leader in the sale not only of oil, but also of finished products.

**Gazprom gathers strength in Europe and Asia.** Gazprom, too, is changing its strategy. Following pressure from the European Commission (which launched an antitrust investigation into the Russian giant last Septem-

ber), and because of the new unbundling rules of the Third Energy Package, the Russian energy giant is changing its corporate structure to sell gas abroad, in such a way as to split off its transport sector activities from its gas sales activities.

Meanwhile, it is strengthening its position in Europe. In November 2012 it bought 100 percent of Wingas, Germany's second-largest gas distributor (with the promise of bringing Wintershall into the Russian upstream), and in December it successfully wel-

ded the first pipes in Anapa, symbolizing the start of construction of the South Stream pipeline. It was only at the end of the year that Gazprom entered into discussions with various Asiatic partners, such as Japan and Vietnam, regarding the possibility of carrying their LNG (liquefied natural gas). And negotiations continue with China for a huge contract for the supply of pipeline gas.

In any case, Gazprom seeks to increase its share of the LNG market (through the Sakhalin-2 project), so

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*Quotidiano*

*Energia, and works for many Italian publications (on the "Russia Oggi" insert for La Repubblica and La Stampa, in particular) and foreign ones such as Expert. He worked as a researcher at the Moscow State University before becoming a manager for intergovernmental and international companies such as Eutelsat and Ericsson.*

as to be more flexible towards buyers (bearing in mind that in 2011, LNG accounted for 25 percent of world gas sales).

The company is also keeping a close eye on the development of shale gas in the U.S.A., but Gazprom believes that "we still have plenty of traditional gas at more competitive prices than American shale gas. Even though the U.S. energy paradigm has changed, when (and if) American LNG arrives in Europe, it will be more expensive than ours."

**The fight on the domestic market.** So there are now two Russian giants on the international scene: Gazprom and Rosneft. But while it does not suit them to be competitors in the international realm (Gazprom has its oil division, Gazprom Neft, and Rosneft also extracts gas – more than 12 billion m<sup>3</sup> a year and rising), they are fighting hard on the domestic market. In November, Rosneft outmaneuvered Gazprom to win a 25-year supply contract with Inter RAO, involving 900 billion m<sup>3</sup> of gas.

Apart from these two giants, there are also other "big" players such as Lukoil, Russia's largest private oil company (which has bought the Priolo Isab refinery from Erg, among others things), and Novatek, the country's biggest independent gas producer. And although Novatek was crushed by Gazprom up to early 2012, in August 2012 it managed to defeat the giant. E.ON selected this independent producer, instead of extending its contract with Gazprom; it signed a contract for the next 15 years

worth €17.6 billion. But Gazprom is not suffering; thanks to the increase in transport capacity to Europe (with North Stream), over the winter season it managed to beat the all-time record, carrying a daily volume of more than 550 million m<sup>3</sup> of gas to Europe.

The strategy now being followed by the Russian companies is to look to the new markets for both the extraction and the sale of hydrocarbons.

The strengths and weaknesses of Chinese national oil companies

# China's "go out" strategy

China's vast NOCs benefit from a low-cost workforce and huge research and development potential. But they lack experience, professional teams in finance and law, and foreign risk assessment

point of view



**T**he internationalization of national oil companies presents a new global structure in the area of oil and gas. As representatives of various interests, national oil companies cannot become international oil companies, nor replace them.

by LIFAN LI

The position of NOCs and IOCs in

the realm of energy sourcing is changing: the NOCs are developing increasing aggressiveness and participating in the competition on the international energy market. Currently, more than 40 NOCs are broadening their foreign markets, and many more are joining them. The four largest NOCs in China are Sinopec Group, CNPC, CNOOC and Sinochem Group. CNPC originally belonged to the former Oil and Industry Ministry and kept to the traditional operational style, which was characterized by intensive planning and

management. In order to adapt to the needs of a socialist market economy, the State Council permitted the company to become a NOC. Based on its status as an oil management system, and especially considering government's direction, CNPC maintains administrative functions and restricts the other oil companies. But this limits its export-oriented development and the company's internationalization strategy.

**The foreign strategy of China's NOCs**  
China's NOCs possess several advan-

tages in overseas development. They are oversized, enjoying low-cost and sufficient labor supplies. They have good research and development potential. Their self-reliance and peace diplomacy provide satisfactory conditions for the NOCs to be pioneers in the overseas market. The chief features of the overseas strategy of China's NOCs are the following:

● **THE SEARCH FOR COOPERATION.** The first characteristic is the search for cooperation and pursuit of relative interests.



NOCs have participated more and more in the international research and development market. To satisfy increasing consumption needs and development requirements, they chose the policy of “going out.” China’s NOCs have chosen to cooperate with competitive international oil companies.

In the international market, nations are obsessed with the interplay of competition and cooperation. Choosing either path means choosing between absolute and relative interests.

● **TECHNOLOGY AND MANAGEMENT.** Second, they strive to avoid the risks of cooperating with the producing countries, and strengthen the progress of technology and management. For more than 10 years, China’s NOCs have been searching for energy sources all around the world. An IEA report in 2009 pointed out that the participation of international competition of China’s NOCs corresponded with business rules. It explained the international markets’ understanding of their behaviors. In cooperation with the companies,

China’s NOCs have learned progressive management culture and technology and mastered the ability to avoid risks.

● **PIPELINE AND DIVERSIFICATION OF IMPORTS.** Third, NOCs support cross-border pipeline building and work toward the diversification of energy imports. The overseas strategy of China’s NOCs includes building pipelines, purchasing energy and capital and investing in energy products. In order to ensure the security of energy supply, NOCs committed to building several cross-border energy pipelines.

The construction has lessened dependence on Malacca and helped bring about the diversification of energy imports.

● **MERGERS AND ACQUISITIONS.** Fourth, internationalization is strengthened and transnational mergers and acquisitions are supported.

However, China’s NOCs are favorable to acquisitions. Recently, NOCs have also purchased refineries. For example, CNPC invested with INEOS in the Grangemouth Refinery in Scotland. The search for energy cannot be described as an easy path. Good energy fields have been taken by large international companies and China’s NOCs are forced to go to the rougher areas in Africa and Middle East. The acquisitions recently approved by China’s NOCs are tied to Singapore NOC and Addax Petroleum. Foreign companies provide better conditions and their legal systems are more sound than China’s. Therefore, many companies do not want to be purchased by China’s NOCs.

Besides purchasing oil companies and fields, CNPC joined with BP and won a 20-years service contract with Iraq’s largest oil field, Rumaila. Compared with unilateral purchases, cooperations with large oil companies bring less resistance and better help China’s companies as they go out to international markets. In 2009, the volume of purchases by China’s NOCs rose to \$13 billion, 80% higher than the same period in 2008. In 2011, the volume rose to \$20 billion.

#### The Overseas Investment Predicament of China’s NOCs

The financial crisis made the flow of capital difficult. A cautious choice of quality overseas properties and investments is an important problem faced by Chinese oil companies. The strategy of “going out” can bring challenge and uncertainty.

● **1 - THE UNCERTAINTY OF OIL PRICE ADDS TO INVESTMENT RISKS.** According to the 2011 Report, the volume of overseas purchases made by China’s NOCs rose to \$20 billion, whereas the volume of international purchases made by global companies dropped 30 percent. SINOPEC spent more than \$10 billion on purchases in the 2 consecutive years. On July 23, CNOOC declared it had spent \$15.1 billion purchasing NEXEN.

Besides oil and gas, China’s NOCs also

In 2011, the amount spent on acquiring oil sands and shale gas stood at more than 70 percent of the total capital outlay on oil and gas supplies. The traditional procurement areas – North Africa, Central Asia and South America – were replaced by North America, Asia and the Pacific region

purchased oil sand and shale gas. In 2011, capital spent on these items made up more than 70 percent of total purchases. Purchase areas were changed from the traditional North Africa, Middle Asia and South America to North America and Asia and the Pacific.

Based on the anticipation of high oil prices, China’s NOCs purchased a large amount of unconventional capital. But it was a large risk, since the international oil price might always drop, and it remained at \$70-80 per barrel.

**ZHOU JIPING.** President of PetroChina, a Chinese oil company that is an associate of the CNPC and is listed on the Hong Kong and New York stock exchanges.



**● 2 - CHINA'S NOCS LACKED PROFESSIONAL TEAMS IN FINANCE AND LAW.** In the beginning of the 1990s, China's NOCs lacked technology, and their staff could not speak foreign languages. Now the situation has changed. Many companies were experienced in ideologies and management in overseas purchase. However, they still lacked professional teams in law and finance.

In 2008, CNOOC purchased Norway Awilco company, which had hidden its own debt.

The purchase capital came from a bank loan, which brought a serious challenge for the company. The incident revealed that China's NOCs depended excessively on mid-sized companies and lacked professional capabilities.

**● 3 - CHINESE FIRMS LACK FOREIGN RISK ASSESSMENT, WHICH MAKES THEM INEFFICIENT.** Lack of experience and erroneous decisions caused China to fail in many overseas investment programs.

For example, CNPC planned to purchase 50 percent of the interest in Canada Encana with an investment of \$5.5 billion.

But due to disagreements on value, purchase procedure and business clauses, the contract was not finalized. Due to lack of risk assessment and operation capability, CNOOC has failed in many purchases. Meanwhile, foreign investment efficiency was rather low because of a lack of legal knowledge.

Around 2009, a security crisis and boundary conflicts forced China's NOCs to delay investment in Sudan. In 2011, the division of Sudan caused a loss of 40 million tons of crude oil for CNPC.

**● 4 - CHINA'S NOCS LACK THE AWARENESS OF ENERGY SECURITY.** CNPC's 2011 Report

revealed that, through the end of 2011, China's four largest NOCs (CNPC, SINOPEC, CNOOC, and SINOCHEN) obtained more than 80 million tons of oil and gas overseas but carried no more than 10 percent back home. Inconvenience in transportation, long distances and high costs were the main reasons.

The final question is how to ensure energy security and carry the oil back home. With increasing international conflicts, security has become more and more important. However, China's NOCs still lack relative strategies. Middle East countries are the main oil providers. Due to the

embargo on Iran, China felt international pressure on oil security. In 2011, the import volume of oil from Iran was 10.99 percent of the total import volume. In the first five months of 2012, China imported 8.12 tons of oil from Iran, 24.97 percent less compared with the same period of the previous year. Therefore, China's NOCs had to launch international discussions and negotiations to increase the energy import volume.

**● 5 - CHINA'S NOCS WERE EASILY CHEATED BY SO-CALLED "DEPENDENT COUNTRIES."**

In 2009, China and Russia reached an agreement on "oil for loans." According to the agreement, China would provide \$25 billion (\$15 billion for Rosneft and \$10 billion for Transneft) to ensure 300 million tons of oil supply in the next 20 years (15 million tons every year). But the Russian media revealed that Rosneft and Transneft planned to use the loan to purchase overseas capital, to expand in the global market.

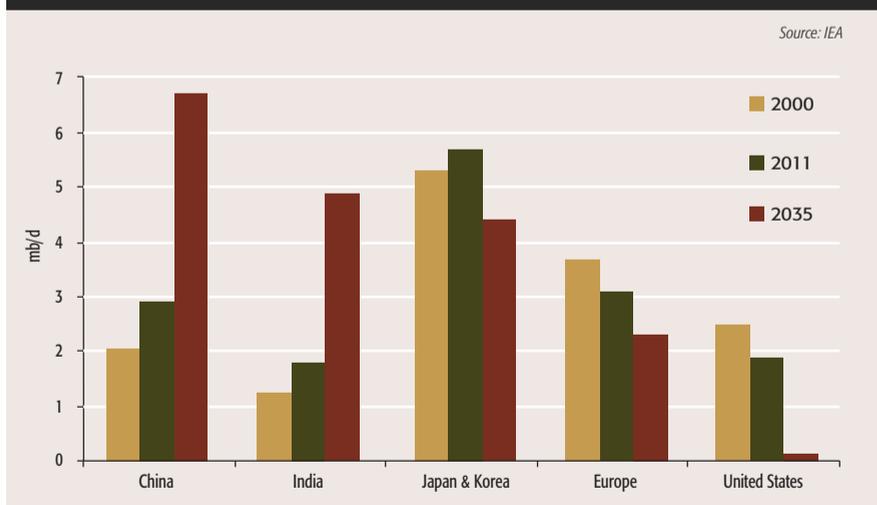
**Conclusion.** Facing a continuous increase of energy demands, China's NOCs should take advantage of the power of international oil companies. They should further their cooperation with foreign companies and bolster their will to cooperate. They should also learn from foreign companies' strategies for blending into the international oil market and becoming a leading player.

Lifan Li is an associate research professor with SASS and advisor to the Overseas Chinese Affairs Office of Shanghai Municipality.



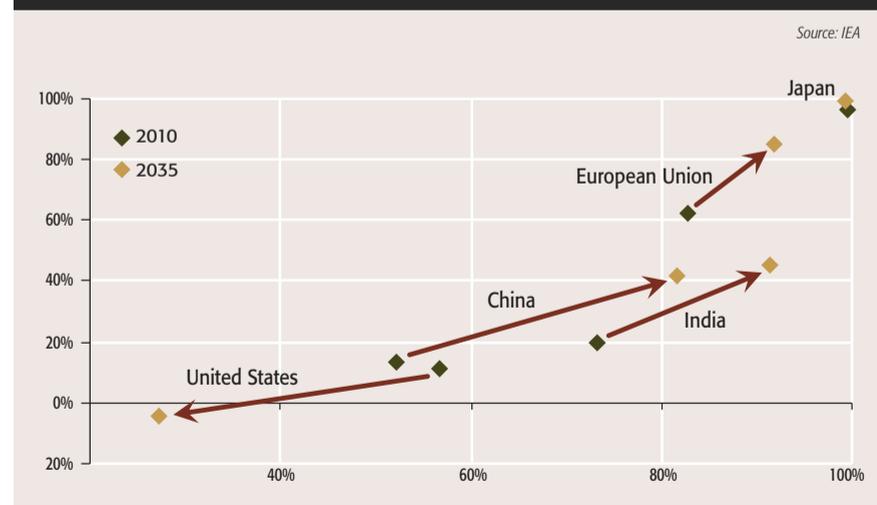
On [www.abo.net](http://www.abo.net), read other articles on the same topic by: Evgeny Utkin, Francesco Sisci, Zou Ji and Nicholas Zhu

**OIL EXPORTS FROM THE MIDDLE EAST**



China's main oil suppliers are Middle East nations. According to the International Energy Agency's *World Energy Outlook 2012*, China will import nearly 7 million barrels a day from these countries in 2035.

**DEPENDENCE ON OIL AND GAS IMPORTS**

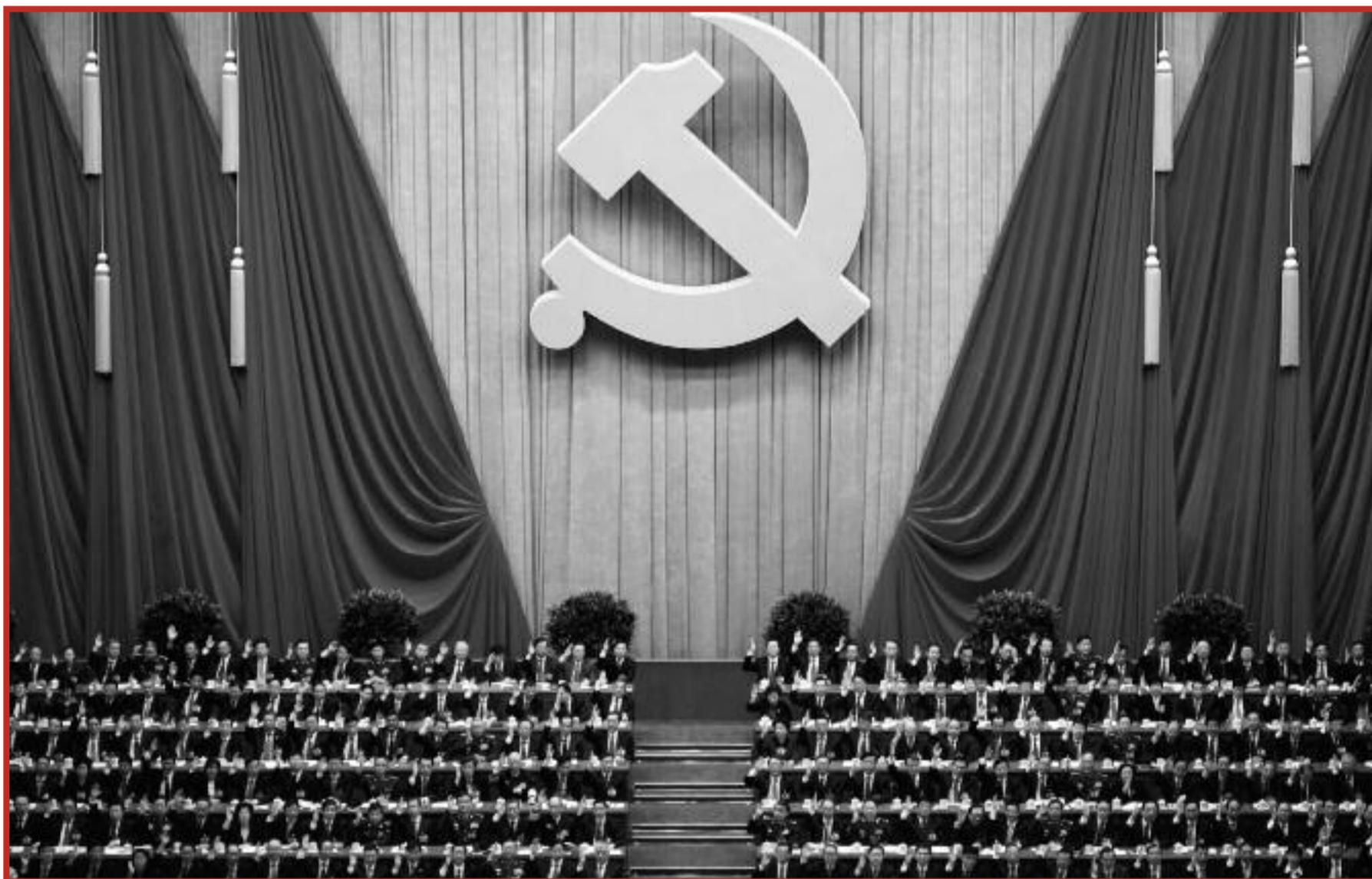


China's dependence on oil and gas imports will increase significantly over the next 20 years. In 2035, China will import around 40 percent of its gas and more than 80 percent of its oil.

Foreign investments of \$48 billion in 2009-2011 alone

# Chinese NOCs between the state and the market

Despite government influence over top appointments and investment choices, and despite access to government credit at good rates, CNPC, Sinopec and CNOOC increasingly follow market principles



point of view

**T**

by GILLES PÉRIGON

hey have the rank of undersecretaries, they sit on the Central Committee of the Chinese Communist Party – albeit as deputy members – and they are appointed directly by the Standing Committee of the Politburo, the élite of China's ruling class: they are the top managers of the

three great Chinese energy companies, the men charged with satisfying the supply demands of the most populous country in the world and supporting the dizzying growth of what is now the world's second-largest economy.

With such a task and such a profile, it would be easy to imagine a bunch of top executives toeing the government line, with a rather limited margin for decision-making. But in recent years the operation of the Chinese NOCs has become increasingly complex and multi-layered, in a mix that combines a “spoils” approach to

national political equilibrium and internal growth with geopolitical and profit motives, while the entire Chinese governing class is working on giving a new meaning to the word “superpower.”

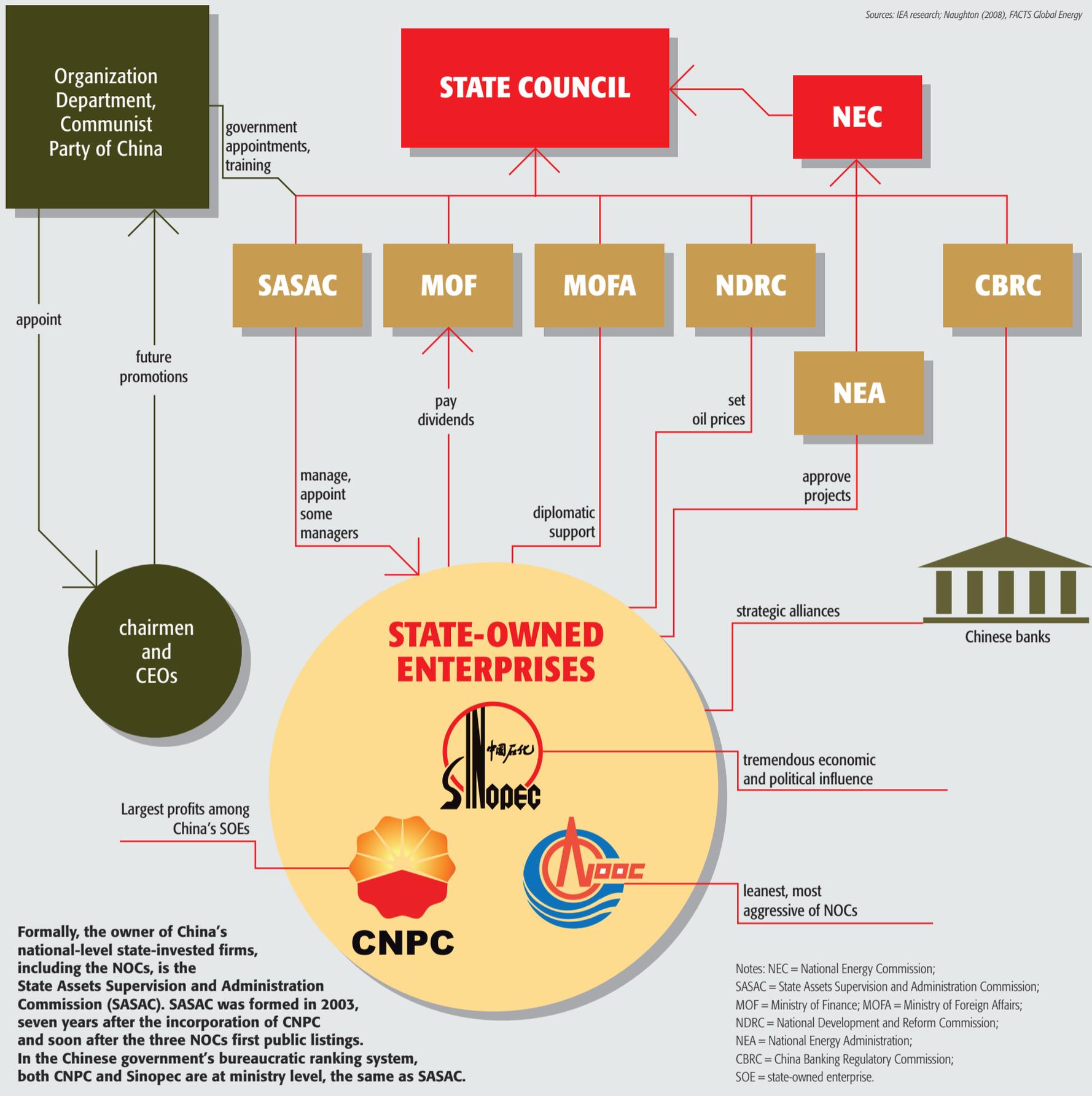
To try to understand the terms of the confrontation and the differences between the international oil companies and the Chinese energy giants, we first need to sketch a profile of the latter group.

**The profile of the three giants.** China National Petroleum Corporation →

**BEIJING, NOVEMBER 14, 2012**  
Delegates voting by a show of hands during the closing session of the 18th National Congress of the Chinese Communist Party. There is an indissoluble link between Chinese politics and the three state-owned oil companies.

RELATIONS BETWEEN STATE-OWNED ENTERPRISES AND GOVERNMENT IN CHINA

Sources: IEA research; Naughton (2008), FACTS Global Energy



point of view

(CNPC), China Petroleum and Chemical Corporation (Sinopec) and China National Offshore Oil Corporation (CNOOC) were created in the early 1980s, during the first phase of economic reforms, as a result of a process of consolidation of the provinces of various ministries.

These companies have a monopoly on the domestic market, and have been committed since the early 1990s to locating the oil and gas resources needed for China's vigorous growth through a progressive internationalization of the exploration and production sectors, which

has led it into Africa, Latin America and the Middle East, not to mention nations with high levels of political risk such as Sudan, Peru and Iran. In 2009-2011 alone, according to official figures, the three giants made foreign investments of more than \$48 billion.

They currently operate in 31 countries and hold exploitation shares in fields located in 20 different countries, although the majority of these interests are concentrated in four highly strategic nations: Angola, Kazakhstan, Sudan and Venezuela. Under the strict Chinese rules on

such matters, much of the business conducted by the "Big Three" has to be regarded as a state secret as demonstrated, for example, by the case of Xue Feng, a geologist of Chinese origin – but a U.S. citizen – who in 2007 was convicted of espionage and sentenced to eight years in prison for disclosing sensitive information to U.S. companies.

However, various reports drawn up by independent international bodies, including the International Energy Agency, give the lie to one of the most widely held beliefs about the Chinese oil industry: according to

these analysts, the Beijing government does not impose a fixed quota of energy resources to be earmarked for the domestic market. One of the most interesting reports in this regard is entitled "Overseas Investments by Chinese National Oil Companies" and was published last year by the International Energy Agency: "Decisions about the marketing of equity oil – where the Chinese company has control over the disposition of its share of production – are mainly based on commercial considerations, in some cases carried out by marketing sub-

sidiaries located outside the headquarters of the NOCs.”

In other words, at the global level the Chinese energy giants are increasingly acting according to market principles, principles that in many cases they are putting before the agenda dictated by the government. Does this thesis reflect the reality, or is it an attempt by the IEA to facilitate Beijing's entry into the organization, even by glossing over all the “political” actions of the Big Three? The factors supporting either of these arguments are too many and too contradictory to be drawn up with any reasonable certainty.

Certainly – as noted by the Shanghai-based researcher Nicoletta Ferro in an editorial published in *AgiChina Energy* – in addition to the government's influence over the appointment of top managers, there are other factors that support the hypothesis of an indissoluble link between Chinese politics and China's three great NOCs: the supervision exercised by the Party over national and international investment decisions, which need final approval from Beijing, and above all, the easy access to government credit at favorable rates that these companies enjoy. This is an element that could prove to be a powerful tool of political persuasion and influence when all else fails.

**The Twelfth Five-Year Plan.** But while foreign analysts and organizations continue to debate the actual influence of the political agenda on the Chinese energy giants, the three NOCs are already changing their DNA on the basis of the guidelines contained in the Twelfth Five-Year Plan. Among the main goals set for the period 2011-2015 are energy efficiency, protection of the environment, and research into new technologies capable of facilitating the transition of the Chinese economic structure from a model based on low-cost production to a model based on high tech. All of these are areas in which CNPC, Sinopec and CNOOC are showing themselves to be particularly adept. A practical example of these trends is provided by the operations of the three NOCs in the shale gas sector. It is well-known that China obtains most of its energy from coal-fired power stations which are producing disastrous environmental effects that are now unsustainable, in economic terms too. Furthermore, China is believed to possess huge reserves of shale gas, but it does not have the technologies needed for extraction: according to experts from the U.S. Department of Energy, China's “technically extractable” reserves amount to 36 trillion m<sup>3</sup>, compared with the figure of around 3 trillion m<sup>3</sup> for proven reserves of conventional gas, calculated in 2009. American analysts also believe that the reserves held by China are more than 50 percent larger than those of the U.S. The estimates coming out of Beijing are more cautious, suggesting that the



**At least on the home front, the battle between domestic NOCs and foreign IOCs already appears to have been won by the NOCs**

reserves technically extractable from Chinese soil stand at around 25 trillion m<sup>3</sup>.

To grasp this hidden treasure that's capable of setting China increasingly free from its enslavement to coal, the Chinese NOCs are pursuing aggressive strategies of partnership with foreign companies that have the necessary extraction technologies, aided by government policies that place precise conditions and barriers on the entry of foreign players into the Chinese market. Thus, while Sinopec and CNPC have several irons in the fire and are negotiating with Total

and Royal Dutch Shell on the commencement of exploration projects – in return for a commitment to an exchange of know-how for developing future fields – the government can afford to closely supervise entrants into auctions for exploitation rights, admitting only the foreign companies that agree to a transfer of technology.

At least on the home front, the battle between domestic NOCs and foreign IOCs already appears to have a winner.



**JOE GAGLIARDI** of ION Geophysical explains the role of oil service companies

# Skills and technology

The “difficult” areas, such as the polar environment and the new frontiers of unconventional exploration, require more sophisticated tools but offer the greatest potential – an appealing scenario for some providers

**T**

by RITA KIRBY

he new energy frontier is in unconventional areas, from the Arctic to the ultra-deepwater: areas that are difficult to explore and that demand increasingly sophisticated technologies. This is an appealing scenario for providers of technological solutions for exploration and

production, such as ION Geophysical, whose Director for Arctic Solutions and Technology, Joe Gagliardi, spoke to *Oil* magazine.

## What are the fastest-growing areas of your business?

We are really focused on frontier exploration activities. We work in areas that demand greater attention from companies. On the global geological map, we like to work in areas that still pose questions. We carry out detailed analyses of the basic architectures, with the aim of providing our

clients with responses to complex geological scenarios. Our goal is to help the companies decide whether it is worthwhile to explore a particular site over the next five or ten years.

## What are the main challenges in this sector?

We believe that the returns from exploration in conventional areas are becoming increasingly sparse, which is to say that easy opportunities for exploration are becoming ever fewer. Against this background, areas like the Arctic will progressively take on in-

creasing importance. We believe that the most challenging areas, such as the polar environment and the new unconventional frontiers, are also those with the greatest potential for E&P. ION is prepared to try to conquer these challenges.

## Are the challenges in these frontier areas always just technological, or is the quality of the oil and gas there different as well?

We have two different types of problems. The first is managing to obtain



**EXTREME FRONTIERS**  
Areas like the Arctic will progressively take on increasing importance, although the huge costs associated with exploration are a barrier to the entry of smaller operators.

mand a greater commitment from an engineering point of view, but where there is the certainty of finding the best rock quality. What guides these choices, in one direction or the other, is – in addition to the group's basic philosophy – the timescale available for bringing the oil and gas to the market. If you're in a hurry and you want to work in the Arctic, then you tend to run more risks from the point of view of the quality of the rock, but with the possibility of drilling quickly. If more time is available, the risks can be concentrated on the engineering techniques to work out how to produce successfully in a context of high-quality rock.

**Can one strategy or the other be linked to the size of the oil companies?**

In the Arctic areas, the number of companies capable of operating is certainly lower, because of the scale of investment needed and also because of the timescale required. The huge costs associated with exploration in the Arctic certainly militate against the entry of smaller operators, compared for example with the Gulf of Mexico or western Africa. We are currently in a phase where the companies work individually or in small consortiums to obtain licenses in increasingly extreme areas, but then they forge alliances to share the industrial program in terms of costs during the exploration and production phase. A similar trend was also seen in the Gulf of Mexico when the deepwater phase began. Initially, this was a way of securing as many licenses as possible, but then consortiums sprang up to share the costs of the industrial phase. I have the feeling that something similar will happen in the Arctic.

**If the Arctic is a new frontier, what about the huge offshore discoveries in Tanzania and Mozambique, which are regarded as first-class? Is it an exaggeration to say that eastern Africa is the new Qatar?**

Eastern Africa is crucial for our growth potential, and I believe it is a world-class area for exploration. In the future, it will play a fundamental role in the energy mix. However, it is not yet clear what direction these commodities will take, whether to the Far East or to Europe. But all the same, it is a magnificent area for oil.

**Do you believe that the U.S. will end up exporting LNG on the wave of the shale gas revolution?**

That's a question for the market. It will depend on demand, and on the capacity of the Far East countries to secure the energy resources necessary to fuel their economies. But unconventional exploration could have a role in Europe as well, with an effect on the prices of natural gas in European countries. The gas market is an extremely regional market, but it could become economic for some regions to export gas.

enough information to determine the quality of the exploration activities. Once this first obstacle is overcome, the next step is to determine whether it is possible, from a technological and engineering point of view, to explore in this particular context. In any event, this is a decision that has to be made by the companies. There are contexts that are less complex than frozen areas, from an environmental point of view, but with rocks that present greater risks. Some companies prefer to venture in areas that are complicated to explore, and therefore de-

Eastern Africa is crucial and represents a world-class area for exploration. In the future, it will play a fundamental role in the energy mix. However, it is not yet clear what direction these commodities will take. However, it is not yet clear what direction these commodities will take, whether to the Far East or to Europe

drilling to the predetermined target to find out what's there. The problem is that this information is precise only for the area where the drilling is done, and not for the surrounding areas, which are defined only by indirect measurements. Generally speaking, seismic exploration provides information on rock formations and how they are structured. It can also give an indication of the hydrocarbons present, and allow predictions to be made regarding the quality of the rock. In unconventional exploration in particular, we have become quite creative just to work out what can be drilled. Of course, since not all the information is obtained by direct measurements, it is not 100 percent precise. We say it's 80-85 percent accurate. But this is just the starting point, because on the basis of this information we then decide where to make direct measurements in order to be absolutely sure. The challenge in our sector, and this is what we are working on, is to supply even preliminary data that is as accurate as possible.

**How would you position ION in relation to giants of the sector like Schlumberger, Baker Hughes and Halliburton?**

Personally, I have great respect for those companies, but I would not want to be one of them. We have found a niche where we can be useful to our clients, by providing them with high-quality services in a very short time frame. We focus on unconventional exploration on land and at sea, as well as in the Arctic. And this is our specialization.

**What do you regard as the most important technological innovation for E&P in the last 30 years?**

3D exploration, without a doubt, and the ability to have a workstation on any desktop. The development of 3D in the 1980s really steered exploration. Then the attention shifted – and in many ways we are still in this phase – to the information that seismic analysis can provide about the properties of the rocks, and from this point of view I believe ION has made an important contribution. Today, we are focused on the Glacial Arctic Ocean, which we believe is the new frontier to be explored.

**So do you rule out greater globalization in gas prices?**

I think it is unlikely. Mainly because natural gas is difficult to transport.

**What are the risks associated with the interpretation of the data that you collect? How pressing are your clients on the timing of feedback?**

The oil companies are demanding increasingly precise answers in increasingly short times. But there is a difference between the simple collection of data and the companies' ability to use that data. We basically provide industry with two types of information: about rock formations, and about oil and gas potential. We make a direct measurement, by



**Joe Gagliardi**

Joe Gagliardi is ION Geophysical Corporations Director of Arctic Solutions & Technology, where his focus is on the development of proprietary solutions (equipment & procedures) for the acquisition of seismic surveys in the global Arctic region. Gagliardi has been with ION Geophysical Corporation, since 2005. Prior to joining ION Geophysical, Gagliardi held various global positions in both field crew management and seismic data processing for multiple seismic contractors. Joe is an Adjunct Professor in Executive Education at the Rice University Jesse H. Jones Graduate School of Management since 2000.



by DANIEL ATZORI

## WATCH DIALOGUES



# Nation-state legitimacy in the globalization era

Globalization, it was believed, would bring the erosion of the nation-state. But the global role of national oil companies (NOCs) such as Saudi Aramco, Gazprom and China National Petroleum Corporation further reminds us of the crucial importance of nation-states in the current historical phase. Until the 1970s, international oil companies (IOCs) used to control around 87 percent of global hydrocarbon reserves, while today their share is estimated to amount to less than 10 percent.<sup>1</sup> While multinational companies, such as IOCs, are certainly major players in the world economy, today about 80 percent of global oil reserves are controlled by NOCs, which also produce 73 percent of the oil.<sup>2</sup>

### The process of globalization coincided with the significant growth of national companies

Thus, the acceleration of the process of globalization witnessed in the last decades coincided with the relative decline of IOCs and the significant growth of NOCs, to the extent that NOCs are now posing significant challenges to IOCs. As a matter of fact, the relationships between NOCs and IOCs have fundamentally changed. Once, they were based on a simple division of labor: IOCs offered know-how, technology and capital, while NOCs granted access to hydrocarbon reserves. But now NOCs have developed capital and expertise to such an extent that they bring into question the very role IOCs will play in the future. It is no coincidence that IOCs are increasingly focusing on complex activities such as Arctic drilling, in order to maintain their position in a very competitive and uncertain environment.<sup>3</sup> As a recent report by Bain & Company puts it, there are three main challenges posed by NOCs. First of all, the position of NOCs in the capital markets is getting increasingly stronger. Secondly, NOCs are robustly investing in research and



**Brazil's President Dilma Rousseff with employees of Brazilian oil giant Petrobras during the opening ceremony for the P-56 oil rig at Angra dos Reis, about 115 miles (185 km) west of Rio de Janeiro.**

development, once the prerogative of the IOCs. Thirdly, NOCs are working hard on enhancing their overall project management and technical skills. But there is more. NOCs used to be accused of being mere inefficient bureaucratic apparatuses which relied on patronage networks in hiring their employees. And certainly the complex relationship of NOCs with their societies is evident in the rise of the phenomenon of "rentier-ism," which characterizes energy producing countries. Indeed, in "rentier states" or countries

whose finances depend not on taxation, but on the allocation of oil and gas revenues, the resource wealth did not translate into virtuous processes of development. As the economist Donald Losman wrote, "The NOCs are far more than mere business organizations designed for profit. They are symbols of the state, of its national prowess and national dignity.... Not surprisingly, managerial processes in NOCs appear to be closer to governmental, bureaucratic models than the same processes at the IOCs. The

NOCs are generally staffed by government — or quasi-government — employees and appointees, and positions are often allocated to regime family, friends, and political allies rather than on the basis of managerial and technical expertise."<sup>4</sup>

### "Bulwarks of nation-state legitimacy" that can also compete globally

Companies such as Malaysia's Petronas and Brazil's Petrobras, however, are demonstrating that state-owned enterprises too can be efficient and competitive on the global scale, as well as behaving as "custodians of their nation's wealth."<sup>5</sup> Thus, NOCs can truly be defined, like sovereign wealth funds, as "bulwarks of nation-state legitimacy"<sup>6</sup> that can also compete globally, going beyond the cage of resource nationalism. It is exactly in this nexus — between their global and national dimensions — that the specificity of NOCs lies. Indeed, although the difference between NOCs and IOCs may sometimes seem blurred, they are nevertheless different in regard to their aims. While the goal of IOCs is the maximization of profit, NOCs cannot ignore the needs of the states that own them, often acting as a tool of the state's foreign policy, as well as suppliers of services to the population.<sup>7</sup> While IOCs focus on the expectations of the shareholders, NOCs explicitly take into account the needs of the stakeholders. It is precisely for this reason that the issue of NOCs' behavior is tightly linked to what is called "corporate citizenship," defined as "a continuum of ideas regarding a company's engagement with society

beyond its principal economic functions."<sup>8</sup> In other words, the agenda of a NOC includes "national" policy concerns such as developing the country's infrastructure or giving jobs to the local population. In light of these dynamics, the promotion of dialogue and the building of partnerships and alliances between IOCs and NOCs can be highly beneficial for the energy industry as a whole:<sup>9</sup> combining global standards of efficiency and transparency with socially accountable business behavior could be a win-win solution for all.

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On behalf of the Fondazione Eni Enrico Mattei, he undertook a period of field research in the Middle East, in order to study the Islamic economy and its social and political interactions.

He is currently researching issues relating to the Arab and Islamic world and is working on a Ph.D. at the Institute of Middle Eastern and Islamic Studies at the University of Durham, England.

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WATCH  
SOCIETY



by ANTONIO GALDO

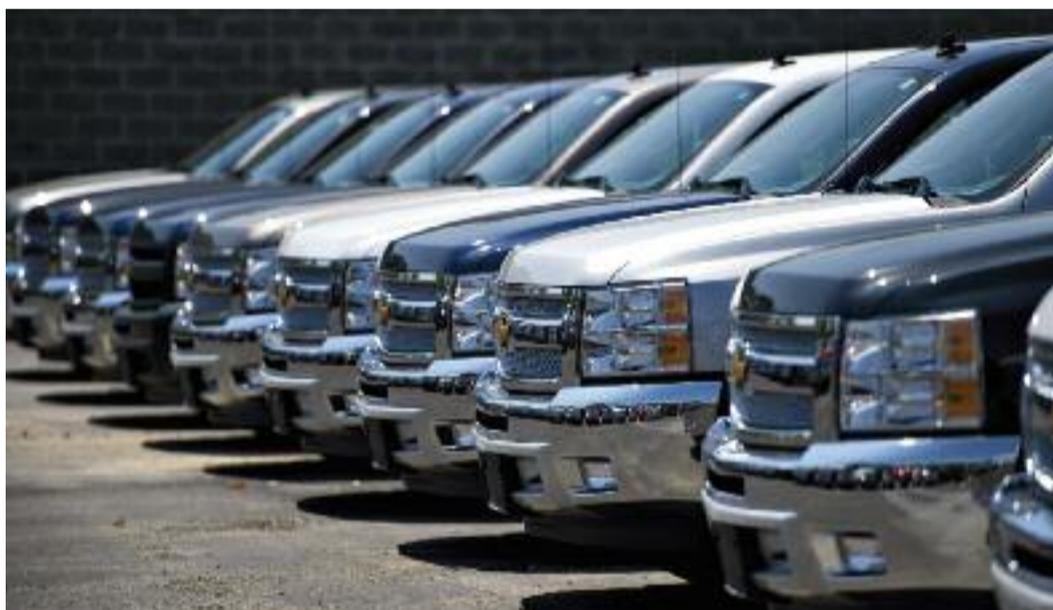


# New markets and new technologies to save the auto industry

In the summer, my father used to load the whole family into the car and drive us around Europe. We would cover thousands of kilometers in stages, just for the pleasure of driving: the rule was that we stopped only to refuel. In the second half of the 20th century, the automobile represented this paradigm: a symbol of freedom, a state of economic well-being, a means of transport for traveling, even over long distances. But with the new century, the perspective was turned on its head: the car has been transformed into a little prison from which every one of us, sooner or later, tries to break free. Running and maintenance costs weigh heavily, especially in times of crisis, and there are also other contributing factors such as environmental pollution, traffic congestion in urban centers, and the constant growth of alternatives in terms of mobility. This is change. And unless we start from here, it becomes impossible to interpret the future of the market and the major automobile companies that are presiding over this change.

**In 2007, just under 17 million cars and light commercial vehicles were sold in Europe; in 2012, this figure plummeted to below 13 million**

This excess of supply over demand has hit the entire western world, with inevitable repercussions on employment and production infrastructures: in the U.S.A., 18 automobile factories have closed since 2008, while the European Automobile Manufacturers' Association (ACEA) forecasts that the current 3.7 million jobs provided by the European automotive industry will be slashed to 250,000 over the coming years. The freefall of the automobile is matched, with perfect symmetry, by a boom in alternative means of transport. In the last five years, the number of people commuting by bicycle in the U.S.A. has risen by 150 percent. All the major cities are equipped with cycling lanes (65 kilometers in Los Angeles alone), and 83 percent of U.S. citizens even favor an increase



in public spending to create new areas for cyclists. Given this scenario, it is only natural to ask ourselves: does this mean the auto industry is doomed to suffocation? Certainly not, but nor can we think that we are just seeing a cyclical negative phase, and that once this has finished, everything – including auto sales – will go back to what it was. The answers from the major groups, in both America and Europe, indicate the two possible paths for pulling out of the tunnel. The first of these has to do with markets: even in the last few years, the slump in sales in the west has been partially absorbed by the increase in demand in eastern countries, and generally in the (former) emerging countries. This is not a trend that will last forever, but the margin for growth in these markets is still significant: forecasts suggest that, thanks to China, India, Brazil and Russia, global automobile sales will rise from 66 million this year to almost 100 million in 2020. But there are warnings signs: countries that were heedless about environmental policies (for

example, China and India) are introducing measures with restrictions on automobile use to reduce smog levels. What we have already seen in Europe and the U.S. is also being replicated in China and India, and so this has to be taken into account. In the metropolitan belt of Beijing, for example, in 2012 the political authorities decided to suspend registrations before going on to dilute them through the drawing of lots. On the other hand, to understand the extent to which penetration of emerging markets has buoyed up the major manufacturing groups, we only have to recall the case of the German company Volkswagen. Supported by constant governmental lobbying – both the social democrats under Schroeder and the conservatives under Merkel – Volkswagen is one of the companies that has held out best against the impact of the crisis. The reason? One car in four sold around the world is bought in China, and the Asiatic market has become the most important one for Germany's flagship automaker.

The second path that will save the automobile industry is that of technology. As the market changes, becoming inexorably smaller (as we have seen), so industry changes too, becoming increasingly global. There is a transformation in the automobile itself, and above all in the relationship with those who buy and use it. What do the consumers want?

**During boom times the buyers demanded performance, but now fuel economy and ecological aspects top their list of priorities**

In short: smaller cars, lower fuel consumption and less pollution. At every auto show, despite the difficult economic situation, every group presents a bundle of new models, all aimed at the differing needs of consumers: hundreds of cars and prototypes, in an onslaught of products such as never seen before in the history of the automobile industry. Technology continues to bring surprises, and it is still too soon to say which will be the winner in the long term. But one thing is certain: from

east to west, all the automakers are speeding ahead with two versions – hybrid and electric. The Japanese maker Toyota alone, for example, plans to launch twenty new hybrid models by 2015, while the race for electric is being played out in the arena of batteries (ever smaller, thanks to lithium-ion technology) and range (they have now broken the barrier of 100 kilometers per charge). The impact of technology will be decisive for finding a new balance between demand and supply, in a climate where the auto has lost its driving force as a status symbol. We see this confirmed in the U.S.A., where major companies like General Motors and Chrysler had been on the brink of collapse but turned around, in 2012, to make very good profits. How? Partly because of generous government aid, which was essential for the companies' restructuring, but above all because of a profound technological shift in the new models. This is also an obligatory course of action for European industry: aid and incentives have been handed down by the French governments of the center-right (Sarkozy) and center-left (Hollande), as well as by the German state, which is providing extremely generous support to its domestic industry. The European Union occasionally tries to raise its voice and launch investigations to determine whether incentives, aid and tax breaks are in breach of competition rules. But these are isolated voices and they have no concrete effect, because in times of crisis, saving the automobile industry is a necessity. Even today, the European auto business accounts for 7 percent of jobs in the manufacturing sector, with a leverage effect whereby each direct position generates four indirect ones. And saving a human and industrial heritage is possible, even if the automobile will never again be what it was in the 20th century.

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The new agreement between Rosneft and BP and AAR for the acquisition of the joint venture TNK-BP will not only be the second largest industrial agreement ever in the oil sector, after the acquisition of Mobil by Exxon in 1999, but also the biggest transaction ever made between a national oil company (NOC) and an international company (IOC). The agreement is only the latest and most emblematic example of the growing cooperation between IOCs and NOCs: in exchange for access to the huge resources "jealously guarded" by the national companies, the majors are committing themselves to providing the capital, technology and know-how necessary to implement increasingly complex and costly industrial projects. However, the strategy of the big global companies will have to reckon with the new evolutionary processes of the world energy market. In its latest Energy Outlook, the International Energy Agency (IEA) predicts that the U.S.A. will become the world's largest producer of gas by 2015 and of oil by 2020, thanks to the development of enormous unconventional reserves. U.S. production of shale gas and tight oil not only threatens the energy primacy of historical producers such as Russia and Saudi Arabia, but requires the IOCs and NOCs to adopt new business models in order to confront new challenges for which they are not adequately prepared.

### **The complementarities between NOCs and IOCs have encouraged industrial cooperation**

Although the NOCs control around 80 percent of global reserves of oil and gas, and contribute more than half of the world's hydrocarbon production, much of their revenues are absorbed by the activities (redistributive and otherwise) of the governments that control them. This limits their capacity for investment and development. The IOCs, for their part, have direct access to little more than 5 percent of global reserves, but have

developed the financial, technological and managerial capacities that make them a key player for the progress of the global energy sector. The complementarity of the respective needs and capacities has meant that cooperation between NOCs and IOCs has intensified over the years, culminating in the Rosneft-BP deal. The strategic alliances between national companies and majors are concentrated in the exploration and production (E&P) sector, where some mega-projects with complex technological features and high capital requirements – such as those in the Russian Arctic – could not be carried out without the investment, entrepreneurial know-how and operational experience of the big private energy companies. The collaboration also extends to downstream segments such as refining and marketing, where the access to

consumer markets provided by the IOCs is crucial to the industrial and commercial internationalization strategies of the companies of the major producing countries. Finally, among the rapidly growing sectors, liquefied natural gas (LNG) is certainly the one where the complementarity of interests and know-how has spurred the NOCs and majors to launch far-reaching joint initiatives.

### **Agility, flexibility and innovation are becoming the watchwords of the new market**

According to the IEA, in 2020 energy markets will be substantially different from today. The overtaking of Russia and Saudi Arabia by the U.S.A., as predicted by the Agency, will be the result of an "industrial revolution" in the energy sector. Huge volumes of tight oil and shale gas will be added to the

world's conventional production. The business model that has led to the expansion of these two sectors is clearly different from that adopted by NOCs and IOCs for developing their conventional resources. Production is based on the exploitation of a very large number of wells, most of them relatively small by global standards. The wells are often developed individually, with generally low costs that allow the producers to introduce new processes and new technologies while minimizing the risks. The development of know-how is therefore incremental and not capital-intensive as it is for large conventional projects. The watchwords are agility, flexibility and innovation – qualities best embodied by small and medium-sized independent producers. Alongside these, however, we must not forget the fundamental role of an extensive network of service suppliers, which – by providing technology, logistical support, equipment and a specialized workforce – represent the backbone of the sector. These characteristics help to explain the marginal role of the IOCs and NOCs in the extraordinary development of the sector.

### **The unconventional revolution will demand a substantial revision of industrial strategies**

The unconventional revolution in the U.S.A. will not only contribute to a rebalancing of the geopolitical dynamics between the hydrocarbon production regions, but will also demand a substantial revision of the industrial strategies of the major oil companies. On the

one hand, these companies will have to try to adapt themselves to industrial development models radically different from the traditional ones, and on the other, they could find themselves in fierce competition for access to a market where the complementarities are no longer so obvious. The effort to take a share of the unconventional bonanza is driving a rapid consolidation of the U.S. industrial sector. The majors ExxonMobil, Shell, BP and Chevron, and also companies such as BG, Occidental, Marathon and Hess, have steered this process, with \$70 billion in acquisitions and joint-venture investments in just a few years. But these companies will have to watch their backs for the initiative of the national companies: China's CNOOC, PetroChina and Sinopec, Korea's KNOC and Norway's Statoil are already present with billions of dollars of investments in the U.S. market. Given the large reserves of tight oil and shale gas outside the North American continent, the competition between the energy companies could quickly extend across the globe. The Chinese market could offer great opportunities, but it remains one of the more controversial cases. Beijing is sending signals that are not very encouraging, such as the decision to impose restrictions on foreign investment in the shale gas sector, which would benefit the Chinese energy giants. This kind of approach threatens not only to put a severe brake on the development of a sector that's very different from the conventional sector, but also to jeopardize the cooperative strategies pursued by IOCs and NOCs in recent years.

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WATCH

## CENTERS OF GRAVITY

# NOCs, IOCs and tomorrow's energy markets



**Vladivostok, Russia. Russian President Vladimir Putin visiting the Rosneft plant. Putin called the agreement between Rosneft and BP "a good deal at a good price."**

The United States' astonishing turnaround

# Towards self-sufficiency

The IEA says that the U.S. will become the world's foremost oil producer by 2017, and could become a net exporter by 2030. Improvements in energy efficiency have played a crucial role in this transformation

**R**emember how the U.S. was running out of oil? A new report from the International Energy Agency now says that the United States will overtake Saudi Arabia as the world's leading oil producer by about 2017 and will become a net oil exporter by 2030.

by **JAMES HANSEN**

Increased oil production, together with effective policies to improve energy efficiency, mean – according to the IEA – that the United States will become “all but self-sufficient” in terms of energy needs in roughly twenty years, something the agency calls a “dramatic reversal of the trend” in most developed countries.

According to the IEA's analysts, roughly 55 percent of this spectacular increase in energy self-sufficiency will be due to increased production; the other 45 percent will be due to improvements in energy efficiency – especially those deriving from new fuel economy standards for automobiles.

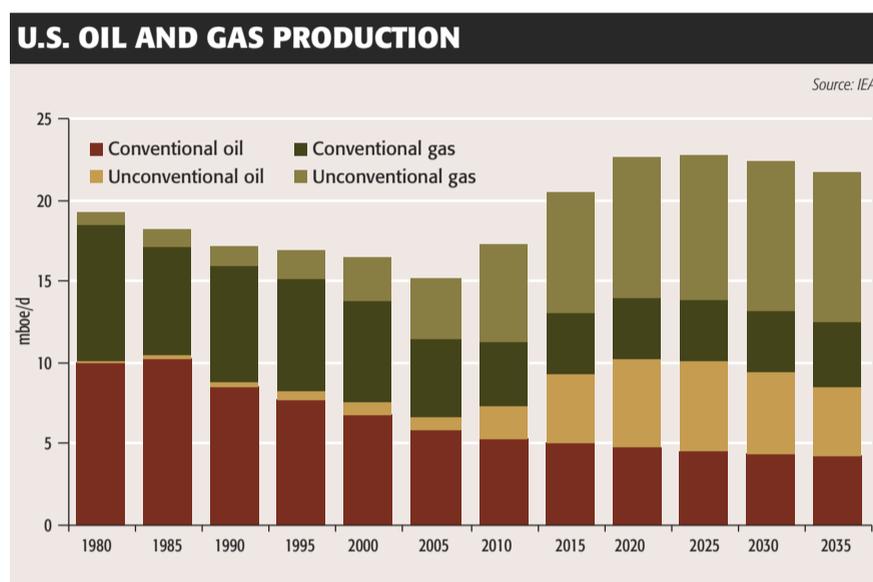
## The revival of hydrocarbon production in the U.S. comes in large part from the introduction of new methods for extracting oil and gas from shale rock

Techniques like hydraulic fracturing and horizontal drilling have allowed the Americans to tap previously inaccessible reserves – sending the price of natural gas, for instance, plummeting.

The IEA report predicts in fact that the United States will overtake Russia as the world's leading producer of natural gas as early as in 2015.

This does not necessarily mean that hydrocarbon energy costs overall will fall very much in North America, because petroleum is what economists call a “fungible” commodity – in short, “capable of mutual substitution,” such as by production in another country.

In other words, when U.S.-produced hydrocarbon products find better prices abroad than at home, exports increase, lessening domestic availability. And vice versa, when prices fall abroad, the overall availability of



This graph shows the expected surge in unconventional oil and gas production in the U.S. over the coming 20 years, which will have global repercussions.

the domestic product rises, since less is exported, increasing supplies and pushing prices down.

But where hydrocarbons are expensive to transport – as with natural gas, for example – the positive domestic economic impact is likely to be much greater. The IEA estimates, for instance, that American electricity prices may fall to only half of those in Europe, primarily because of an increase in the number of power plants fueled by cheap – and difficult to export – natural gas.

The unexpected return to energy self-sufficiency after more than forty years – U.S. oil production peaked in the early 1970's and has been in decline since then – may have only limited effect on the American economy in terms of prices, but it will have enormous impact on energy security; that is, the certainty of supply.

## Suddenly, unexpectedly, the cards in the “Great Game” of global geo-politics are being re-shuffled

Declining American energy reserves have made the country increasingly dependent on foreign suppliers over recent decades. Among many other effects, this has made the assurance of its energy sources the country's primary foreign policy imperative since the end of the Cold War.

The lines of supply to make up the

gap in production have been long – stretching around the world – and difficult to protect. It cannot be a surprise that the two most important American – or at least “American-led” – foreign military initiatives in the decades since the Vietnam War have been the Gulf War of 1991 – the defense of oil-producing Kuwait against an Iraqi invasion – and, a dozen years later, in 2003, the invasion of Iraq itself, intended to bring down the regime of Saddam Hussein. In the second case especially – and beyond any consideration of Saddam's “weapons of mass destruction” which were never found and were, in any event, never much of a direct threat to the Continental United States – the policy objective would appear to have been the defense of the existing status quo in the Gulf Emirates and, most especially, in Saudi Arabia.

The remarkable tolerance shown by the United States for Saudi Arabia, a nation with which it fundamentally shares little liking and even less in terms of cultural dynamics – and which was the homeland of 15 of the 19 Al-Qaeda terrorists who brought down the World Trade Center – gives an idea of the lengths the United States has been prepared to go to guarantee energy supplies from the Middle East.

The Americans will never be happy

to see chaos in the Gulf. Even if the U.S. does not directly consume a disproportionate amount of Saudi oil, its domestic prices march in line with those of this distant source of production.

Still, it is probably fair to suggest that the U.S. diplomatic boiling point will drop over time as a result of its lowered vulnerability, since Arab producers will lose the important lever of being able to damage or even shut down the American economy. Interestingly, it is likely that this threat may now simply find a new target.

## The same Middle Eastern oil that once went to the United States will very probably be rerouted to China and the insatiable energy demands of that market

The phenomenon is visible in the case of American-mined coal which, facing declining demand at home, is already shifting destinations to Europe and China instead.

In conclusion, whether the stunning American success in healing the wound of energy dependency is good news or not depends greatly on the point of view of the observer.

Global warming activists, for instance, are appalled. They had hoped that scarcer energy and rising costs would discourage the production of greenhouse gases. Though natural gas, the key new American resource, is often praised for generating fewer carbon emissions than oil or coal, concerned climatologists regard any increase in global energy availability with suspicion.

In that connection, it may be worth remembering that the surprising American result has been made possible not just by the discovery of techniques to exploit new energy resources, but with huge improvements in energy efficiency as well.

James Hansen provides financial reporting and international relations consulting to major Italian companies. He came to Italy as the U.S. Vice-Consul in charge of economic affairs at the U.S. Consulate General in Naples. He became a correspondent for various leading foreign press organizations, including the *International Herald Tribune*. He was subsequently appointed spokesman for Carlo De Benedetti and Silvio Berlusconi, and then head of press for Telecom Italia.

Market trends

# 2012, a market in transition

Oil prices have been relatively stable in 2012. However, market fundamentals reveal significant changes and profound issues

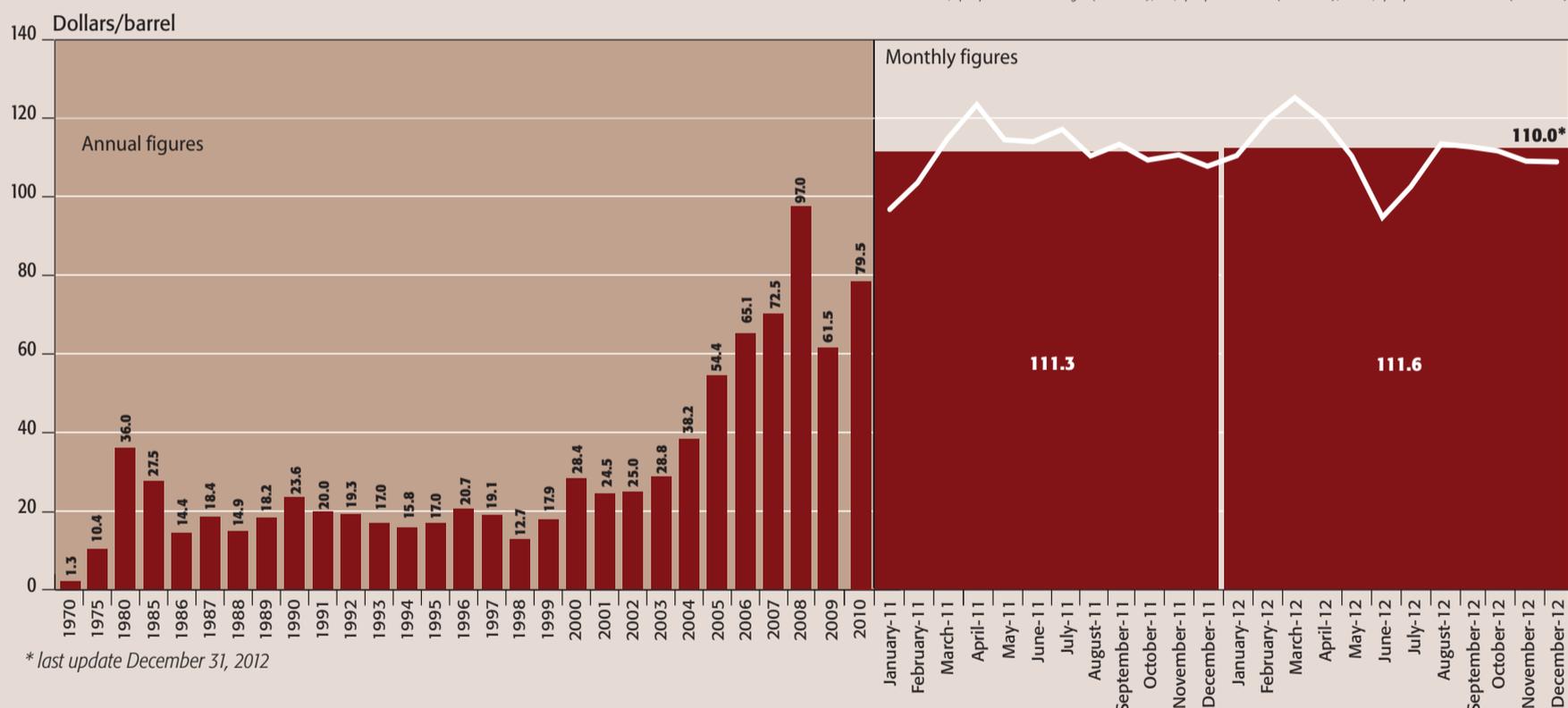
by Eni's Planning & Control Department  
Long-term Market Scenarios and Strategic Options

working tools

## The price of oil

### AVERAGE MONTHLY PRICE OF CRUDE

Source: IEA, spot price of Arabian Light (1970-1985); IEA, spot price of Brent (1986-1987); Platt's, spot price of Brent Dated (from 1988)



\* last update December 31, 2012

The price of oil remained noticeably stable over the closing months of 2012, despite major imbalances affecting market fundamentals.

As the International Energy Agency said in its December report, the market has entered a period of transition. On the surface, crude prices are fluctuating within a limited range – with Brent at around \$110/barrel in the last quarter – yet the market has had to deal with major and apparently negative changes.

The supply side continues to be affected by severe turbulence, with the United States stepping up sanctions against Iran, leading European and Asian countries to cut their Iranian crude imports still further. Indeed, exports of Iranian crude have now fallen to a little over 1 million barrels per day (mb/d), compared to pre-embargo figures of 2.5 mb/d. Several conflicts with global implications – including those in Syria and Sudan – remain unresolved.

Meanwhile, the development of unconventional sources in North America (and especially U.S. tight oil) is gathering pace, which is having a significant effect on the balance of international crude oil and oil product flows.

On the demand side, there is continuously conflicting data on sustained Chinese growth, although it does now seem to have picked up again.

The European economy remains compromised, however, and the U.S. lies somewhere in the middle, with see-sawing figures and expectations.

The apparent calm on the markets is due, in part, to the role played by OPEC.

Its decision to maintain overall production at 30 mb/d – first taken in December 2011 and confirmed a year later – without individual quotas, has given Saudi Arabia the power to act as undisputed swing producer. As the only country to hold significant spare capacity, Saudi Arabia has stepped in since late 2011 to compensate for drops in supply from Libya and Iran, thereby limiting any price hikes.

This volatility, however, was merely transmuted elsewhere. Demand imbalances that are increasingly concentrated in the East, as well as the tight oil revolution that will see the U.S. take the leading position among major producers, and the growing globalization of the oil products market, have caused severe oscillations in relative prices between crudes and refined products.

The oil market is now becoming increasingly characterized by instability and intra-market differences. And although this is making it possible to broach new frontiers of development, it is also raising the industrial and political stakes.

The ongoing market uncertainties have led most analysts to predict that, in 2013, oil prices will remain close to current values, or perhaps fall slightly due to increased supply outstripping growth in demand.

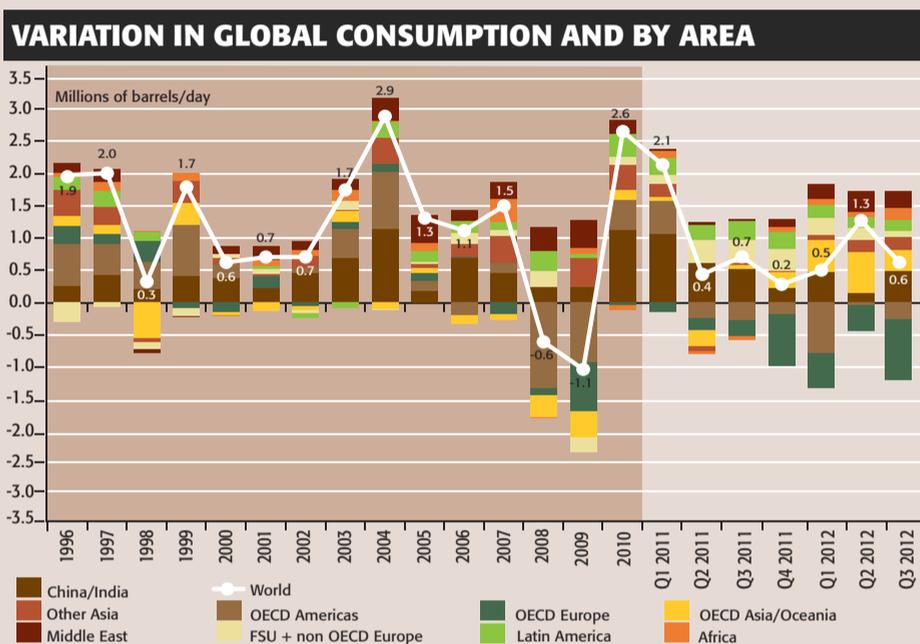
On the other hand, there is always the risk that geopolitical issues will cause crude prices to stray outside their current, fairly limited range.

# Oil demand

Global oil demand grew by 0.6 mb/d in the third quarter of 2012, down from second-quarter figures (+1.3 mb/d) due to declining consumption in Europe (down 6 percent, or 0.9 mb/d, compared to Q3 2011); this is the worst since the financial crisis began in 2008-9. European consumers have been hit particularly hard during the recession by the weakening of the euro, which has made oil prices – which are largely driven by crude prices denominated in dollars – even more expensive.

All European countries, from the north to the south, have seen drastic falls in consumption, including Portugal (-13 percent), Poland (-11 percent), Italy (-9 percent), Greece (-9 percent), Spain (-8 percent) and Germany (-7 percent). Only the Czech Republic, Denmark and Norway saw increases in oil consumption.

In terms of oil products, the major losers were diesel oil (-5 percent), fuel oil (-14 percent) and liquefied petroleum gas (LPG, -6 percent), since they are tied to economic performance in general. Indeed, the Purchasing Managers' Index (PMI) for euro-zone manufacturing – which is used as a bellwether of the economy – has been falling for some 14 months in a row. Moreover, double-digit unemployment rates have also pulled down demand for fuel, with petrol down 7 percent and demand for diesel and jet kerosene down 3 percent. However, consumption continued to increase across the OECD as a whole, with China and India together accounting for 40 percent of total growth among emerging markets in the third quarter (up 0.6 mb/d). Oil consumption in China increased steadily from August, gaining 10.3 percent in September and 6.5 percent in October and November. The country's manufacturing PMI has also returned to growth, after falling from late 2011 onwards. India's economy remains robust, which is helping to prop up diesel oil consumption in particular, where India accounts for 40 percent of total demand.



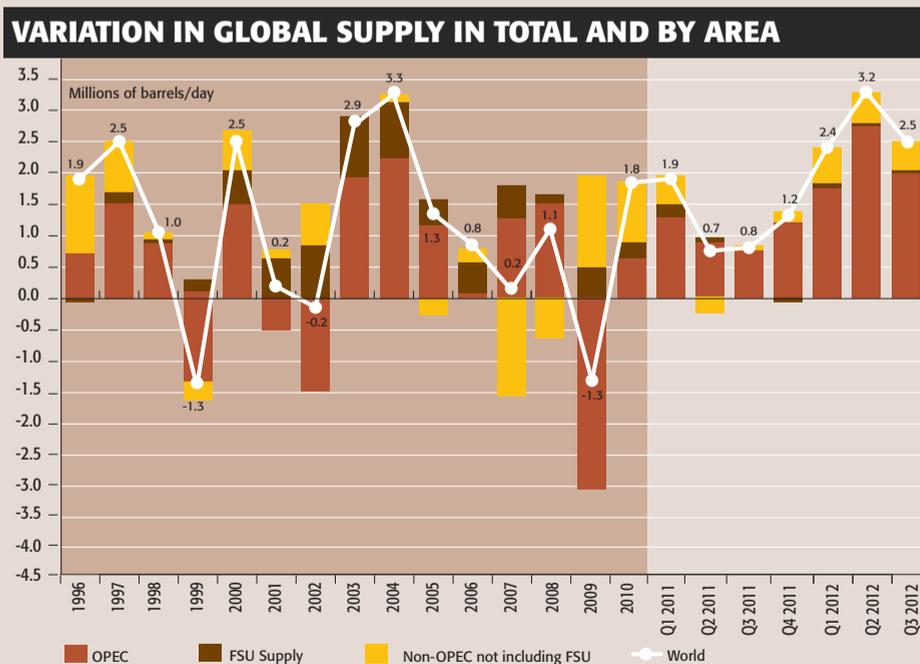
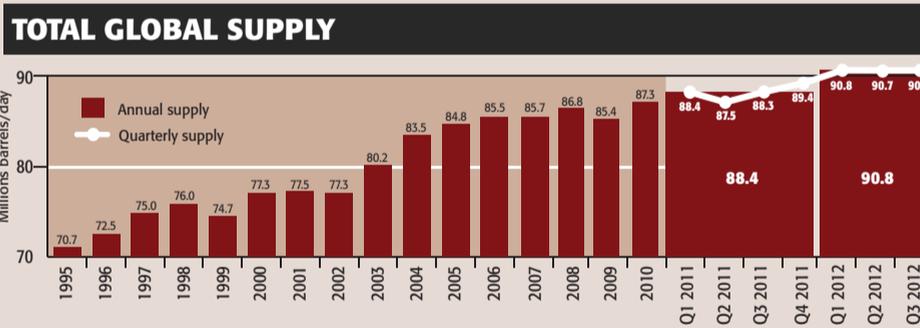
Source: prepared by Eni with data from the International Energy Agency; changes over the same period of the previous year

# Oil supply

Global oil supplies reached 90.8 mb/d in the third quarter of 2012, up 2.5 mb/d over the year before, with almost all of the increase provided by OPEC countries. By contrast, output growth in non-OPEC countries was sluggish, at just 0.3 mb/d, due to geopolitical problems in Sudan and Syria and to structural issues in the North Sea.

United States output did buck the trend: it continued to grow rapidly (up 1 mb/d), thanks to tight oil; also of note during the third quarter was the ramped-up development at the Eagle Ford play, which reached production levels matching the Bakken play (0.6 mb/d). Russia also achieved significant results, achieving a daily output of over 10.7 mb – the highest ever in the post-Soviet era.

OPEC production increased by 2.2 mb/d – accounting for around 90 percent of the overall growth in supply – helped out by both crude (up 1.6 mb/d) and LNG (up 0.6 mb/d). The most dynamic country was Libya, where production returned to pre-war levels, although the most significant change in recent months was the escalation of Iraqi oil production, which overtook Iranian output from July onwards. Iran continues to suffer under the embargo, with output in November falling by more than 0.9 mb/d. In Saudi Arabia, meanwhile, production stabilized at a little under 10 mb/d following spikes in output in the early months of 2012. OPEC decided in its December 12 meeting to maintain production at the current level of 30 mb/d – although the cartel's output has actually consistently exceeded 31 mb/d since the start of the year. The general economic situation is a real concern for OPEC members, which see stagnant demand and the growth of non-OPEC oil production as two challenges to their market share. The outlook for "call-on-OPEC" crude oil during 2013 has fallen still further, dipping below the 30 mb/d threshold. A number of key questions also remain unresolved within the cartel, with Iraq's demand for greater opportunities foremost among them. On the one hand, OPEC believes Iraq must be given a quota as a matter of urgency, while on the other hand, Iran, Venezuela and Ecuador say that the country needs more time to achieve stability after years of war and sanctions. Given that it has the potential to increase output to 4 mb/d by 2014, Iraq hopes to avoid being subjected to a quota for as long as possible.



Source: prepared by Eni with data from the International Energy Agency; changes over the same period of the previous year

working tools

## deals



## Rosneft and Exxon agreement on Siberian tight oil



**Rex Tillerson, Chairman and CEO of ExxonMobil and Igor Sechin, President of Rosneft.**

commit \$300 million to the Siberian tight-oil pilot project. The Bazhenov and Achimov shale formations in western Siberia, where the pilot program will launch, are expected to hold huge volumes of crude. Rosneft has estimated the potential yield of its Siberian tight-oil licenses at between 15 billion and 20 billion barrels of crude.

**December 10** - Rosneft signed a \$300 million agreement with U.S. energy giant ExxonMobil to assess the possibility of commercial production of Siberian tight oil, opening up access to geological formations that could yield billions of barrels of crude. A joint venture will be established between the two companies to carry out the feasibility study across 23 license blocks covering 10,000 square kilometers in western Siberia, according to an e-mailed statement from Rosneft. Rosneft will control a 51 percent stake. Exploratory drilling will begin in 2013. If the results are positive, commercial production of tight oil (the crude locked in shale deposits several kilometers below the Earth's surface), is slated to start in 2015. The agreement is part of a broader strategic partnership between Rosneft and ExxonMobil that was signed in August 2011 and includes cooperation on Russia's Arctic shelf and Rosneft's entry into an ExxonMobil tight-oil operation in Texas. Besides its considerable technical expertise, ExxonMobil will

### British Gas and Petrobras win natural gas deals in Bolivia

**December 31** - British Gas and Brazilian energy company Petrobras have won bids to explore for natural gas in Bolivia. Bolivia nationalized its energy industry in 2006 but has also been seeking more foreign investment to help tap its vast reserves. Bolivia's state energy company

YPFB, in a statement on its website, announced that the British and Brazilian companies had been awarded areas to explore for gas. It said their investments would help boost exploration efforts in Bolivia, but it did not give details about the planned investments or the terms.

### Woodside and Myanmar Petroleum agree on joint venture

**December 11** - Australian petroleum exploration and production company Woodside Petroleum said on Monday that it has reached a joint venture agreement with Burmese Myanmar Petroleum E&P Pte Ltd to explore Block A-6, located off the Arakan State coast. "The offer is for a 50 percent interest in the block," the company said. "The proposal provides the opportunity for Woodside and MRPL E&P to undertake a 3D seismic survey program in the block and an option for future drilling." The deal was subject to further conditions such as

due diligence and government approval. In October, Woodside entered into a similar agreement with Daewoo International Corporation for exploration in offshore Block AD-7.

### Tullow Oil Announces \$372 Million Norwegian Deal

**December 11** - Tullow Oil revealed the purchase of Spring Energy, a Norwegian exploration company. Tullow said it would pay \$372 million for Spring. The oil group also said bonus payments of up to \$300 million would be paid depending on Spring's exploration results. Spring holds 28 offshore licenses that cover approximately 18,000 square kilometers across the North, Norwegian, and Barents seas. Tullow claimed that Spring had made six commercial oil discoveries from 12 wells drilled since 2008 and that Spring would drill a further 16 wells during the next year or two. Tullow also reckoned Spring's license portfolio could

## books

## the reader



Carlo Rossella is a journalist and executive. He has been the head of *La Stampa*, *Panorama*, and TG1 and TG5 (the TV news programs). He is currently chairman of Medusa Film, the production company of Mediaset.

## The history of the Islamic Republic, as told by those who helped Iran, nuclear enrichment

Some books exist to help you understand, to bring you deep into worlds that are unknown to anyone without personal experience of the intricacies of international intelligence and politics. Because of disinformation and the subtle art of obfuscation, Iran – the Islamic Republic that came from the Khomeinist revolution – has become one such hidden world. And while Dante Alighieri, Italy's greatest poet, was guided through hell by Virgil in the *Divine Comedy*, now anyone wanting deeper knowledge of Iran – and the vagaries of its nuclear research, for peaceful purposes or otherwise – can turn for guidance to two books published in the United States.

The first is *The Iranian Nuclear Crisis: A Memoir* by Seyed Hossein Mousavian, published by the Carnegie Endowment for International Peace. Mr. Mousavian, 56, is an Iranian politician who has led negotiations between the government in Tehran,

the European Union and the Atomic Energy Agency. He has served in several high offices in Iran: ambassador to Germany; head of the Foreign Relations Committee of the Supreme National Security Council during the presidency of Mohammad Khatami; and Foreign Policy Advisor to Ali Larijani, nuclear affairs adviser to Ali Khamenei, the Supreme Leader of the country's political and religious life. He fell from favor, though, at the start of the Ahmadinejad government and was accused of espionage, before eventually being cleared and given permission to emigrate, whereupon he left for Princeton University in the United States.

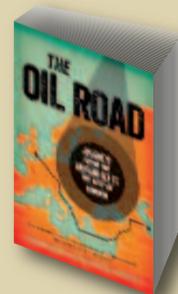
Mousavian's analysis sheds light on the internal conflicts running through the Islamic Republic, but its points are all gathered around a basic argument: Iran's right to develop nuclear energy for peaceful purposes. He puts forward his suspicion that the



**Title:** The Big Flatline: Oil and the No-Growth Economy  
**Author:** Jeff Rubin  
**Publisher:** Palgrave Macmillan  
**Info:** 2012, 272 pages  
**Price:** \$27



**Title:** Power Plays: Energy Options in the Age of Peak Oil  
**Author:** Robert Rapier  
**Publisher:** Apress  
**Info:** 2012, 272 pages  
**Price:** \$24.99



**Title:** The Oil Road: Travels from the Caspian to the City  
**Authors:** James Marriott and Mika Minio-Paluello  
**Publisher:** Verso  
**Info:** 2012, 376 pages  
**Price:** €26.95



contain in excess of 230 million barrels of "risky prospective resources."

### Exxon Mobil in offshore explorations in South Africa

**December 19** - The world's largest publicly traded oil and gas company, Exxon Mobil, has signed an agreement to begin offshore exploration activities on the east coast of South Africa through its affiliate ExxonMobil Exploration and Production South Africa, the company announced on Monday. The agreement was signed with Impact Africa Limited - a subsidiary of British Impact Oil and Gas Limited - to acquire a 75 percent participating interest and become operator in the Tugela South Exploration Right. Under the agreement, ExxonMobil Exploration also has the right to acquire 75 percent interests in future exploration rights in three offshore areas, subject to South African government approval. "We believe South Africa has significant potential and we will continue to look

for additional opportunities there," said ExxonMobil Exploration president, Stephen Greenlee. The Tugela South Exploration Right covers about 2.8 million acres offshore Durban in KwaZulu-Natal. It has water depths extending from the coastline to approximately 6,500 feet (about 1.98 kilometers). The future exploration rights cover an additional 16 million acres

offshore with water depths extending from the coastline to approximately 9,800 feet (2.99 kilometers), ExxonMobil said.

### Quicksilver Resources buys Shell interest in Sand Wash Basin

**December 28** - Looking to unlock Niobrara oil reserves, the oil and gas

company Quicksilver Resources Inc., of Fort Worth, Texas, closed its previously-announced Sand Wash Basin acquisition and exploration agreement with SWEPI LP, a subsidiary of Royal Dutch Shell Plc, on December 28, 2012. Quicksilver now owns a 50 percent interest in approximately 320,000 net acres in the Sand Wash Basin in Northwest Colorado, which will be jointly developed with

SWEPI. The agreement also established an area of mutual interest covering more than 850,000 acres in the basin. SWEPI paid Quicksilver an equalization payment for 50 percent of the acreage contributed by Quicksilver over and above the acreage that SWEPI contributed.

## China's CNPC extends global reach

**December 12** - China National Petroleum Corp. (CNPC) announced two major overseas acquisitions in mid-December as the oil giant continued its accelerating global expansion. State-run CNPC said on Dec. 12 that it would buy a 10.2 percent stake in the Browse liquefied natural gas (LNG) project in Australia, for \$1.63 billion, from the mining company BHP Billiton. Just two days later, CNPC announced that it had partnered with Canadian natural gas producer Encana Corp. to develop shale-gas fields in



northern British Columbia. The Chinese company paid nearly \$2.2 billion for a 49.9 percent share in a joint venture with Encana. These agreements and deals earlier in the year brought total overseas oil and gas acquisitions by Chinese companies to \$34 billion in 2012, according to the CNPC Economics Technology Research Institute. CNPC plans to continue its shopping spree for at least two years. The company wants its foreign wells to produce 200 million tons of oil a year by 2015, or about twice its 2012 overseas production level.

### Rosneft takes out a \$16.8 billion loan for TNK-BP acquisition

**December 24** - Rosneft signed two loan agreements for \$16.8 billion with international banks to buy BP Plc's half of TNK-BP, the state-run company said in a statement. BP and its billionaire partners in the TNK-BP venture signed binding agreements in the last quarter with Rosneft for the biggest sale ever in Russia, ending their fractious decade-long partnership. The deal will vault Rosneft past PetroChina Co. to become the world's largest publicly traded oil producer with output of more than 4 million barrels a day, based on third-quarter results.

working tools

# shape it and the U.S. conflict

United States' real goal in Iran is regime change, rather than an agreement on nuclear enrichment. The second book is *The Twilight War: The Secret History of America's Thirty-Year Conflict with Iran*, written by David Crist and published by Penguin Press. The author, a visiting fellow at the Washington Institute, takes a very different tack from Mousavian's in his analysis. The son of a general in the United States Central Command in Tampa, Crist is a military historian, a former officer in the Marines who served in the 2003 Iraq War, and a consultant to the Pentagon. He was able to make use of declassified documents as he reconstructed the relationship between the United States and Iran: effectively a long-term cold war that has lasted 30 years and shows no signs of abating - for now at least - despite President Barack Obama's advances. Crist brings together 300 interviews to tell the fascinating story of this public rivalry, with

interesting and original behind-the-scenes reporting on confidential intelligence operations and negotiations. Of course, neither book addresses the massive consequences of the anti-Iran sanctions, which are currently costing Tehran \$60 billion per year and have brought its economy to its knees - almost more destructively than war. For example, Iranian oil exports have fallen 55 percent since the start of 2012, losing it \$35 billion in revenue. Inflation now stands at 50 percent or more, with official data putting it at 23 percent in August. For example, the price of milk increased 30 percent between August and September 2012, with even harsher sanctions brought in during January following E.U. decisions announced on October 15. Tehran's people are suffering, and on October 3 a riot was put down by security forces, though its embers continue to glow. There will be many more books to write about Iran.



**Title:** The Iranian Nuclear Crisis. A memoir  
**Author:** Seyed Hossein Mousavian

**Publisher:** Carnegie Endowment for International Peace  
**Info:** 2012, 612 pages  
**Price:** \$49.95

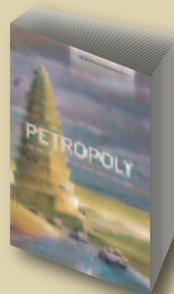


**Title:** The Twilight War. The Secret History of America's Thirty-Year Conflict with Iran  
**Author:** David Crist

**Publisher:** Penguin Press  
**Info:** 2012, 656 pages  
**Price:** \$21.90



**Title:** The Pricing of Internationally Traded Gas  
**Author:** Jonathan Stern  
**Publisher:** Oxford Institute for Energy Studies  
**Info:** 2012, 400 pages  
**Price:** \$50



**Title:** Petropoly: The Collapse of America's Energy Security Paradigm  
**Authors:** Gal Luft and Anne Korin  
**Publisher:** CreateSpace Independent Publishing Platform  
**Info:** 2012, 182 pages  
**Price:** \$18



What books would you recommend? Send an e-mail to [editorialstaff@oilonline.it](mailto:editorialstaff@oilonline.it)



December 2012

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