

## STRATEGIES OF OIL AND GAS CORPORATIONS. A REVIEW OF THE LITERATURE

*In our paper we seek to answer the question of what the publicly available literature says about the upstream and downstream strategies of oil and gas corporations in the first decade of the 21<sup>st</sup> century. We would like to know what energy source or technology do national and international oil companies focus on in producing hydrocarbons or replacing their hydrocarbon reserves (conventional vs. non-conventional oil or gas, renewables, gas-to-liquid, coal-to-liquid, biofuels, deepwater drilling etc.). Our further question is how the geographic location of upstream and downstream assets changed between 2000 and 2010. In addition, we would like to know how international oil companies (IOCs) and national oil companies (NOCs) cooperate.*

*We found that there is quite an extensive literature on the cooperation of NOCs and IOCs, mostly focusing on future expectations and assuming that the groups of IOCs and NOCs are homogeneous. Further, although the questions raised are of crucial importance for oil companies, there is a lack of publicly available research on how individual firms compete, how and whether their focus on different energy sources changed (e.g. from oil to gas), what upstream technology they develop and how they locate their upstream and downstream assets.*

*JEL: Q01; Q48*

### Introduction

An average oil field can produce oil for 10-15 years, the natural decline rate is roughly 5% annually.<sup>2</sup> Global oil demand – now forget about the rare crisis years – increases by an annual rate of 1-2%. All this implies that if an oil company seeks to keep its market share in oil production steady, it has to enhance its production base

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<sup>2</sup> Norman J. Hyne (2001): Nontechnical guide to Petroleum Geology, Exploration, Drilling and Production, 2nd edition, PennWell Corporation, USA, pp. 419.

annually by approximately 7%. The natural decline rate of gas fields is lower, around 3% annually but increase in gas demand changes between 2 and 4% yearly.<sup>3</sup>

By analyzing the oil industry supply chain you will find that roughly three quarters of the profit made by oil companies stems from the upstream sector<sup>4</sup>. This is the reason why you can call the upstream departments of oil companies the department of the most and strategic importance.

Based on this, it is obvious why the most crucial task of oil companies' top management is to find and choose new exploration and development (E&P) projects and financing methods reducing or rather diversifying geological, technological, financial and geopolitical risks.

Therefore, in our paper we are examining what – if anything – the literature says about the upstream (oil and gas exploration and production) strategies pursued by oil companies between 2000 and 2010. We are expecting to get an answer to the question what technology oil companies are developing to replace old hydrocarbon reserves (gas-to-liquid, coal-to-liquid, biofuels, deepwater drilling, conventional vs. non-conventional oil or gas, renewables etc.). Further, we would like to get to know how the oil companies' upstream assets' location changed in the first decade of the 21<sup>st</sup> century. Another subquestion refers to the cooperation partners of oil companies and the characteristics of the projects in which they work together.

Our second question is what downstream strategies were pursued by oil companies between 2000 and 2010. Within this, we seek answers to the question whether and how the geographic location of the downstream assets (refineries, petrochemical plants, fuel station networks etc.) of oil companies changed and whether there were any changes implemented in them (capacity enhancement or reduction, increased production of certain products etc.).

### **The Literature on NOCs and IOCs**

You can find many papers on the future of national oil companies (NOCs) and international oil companies (IOCs) and the expected cooperation emerging between them<sup>5</sup>. However, many of these papers unsaid assume that the group of both the NOCs and IOCs is a homogenous one. We do not share this view but as these papers are relevant for us (because this is a crucial point in the strategies of oil companies) we are beginning our review with them.

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<sup>3</sup> BP (2010): BP Statistical Review of World Energy June 2010, London.

<sup>4</sup> See for instance here: [http://www.petrostrategies.org/Learning\\_Center/oil\\_and\\_gas\\_value\\_chains.htm](http://www.petrostrategies.org/Learning_Center/oil_and_gas_value_chains.htm) (downloaded: 11th November 2010).

<sup>5</sup> See e.g.: David Ledesma (2009): The changing relationship between NOCs and IOCs in the LNG chain, Oxford Institute for Energy Studies, July 2009, NG 32.; Isobel Rea (2008): Accessing oil and gas reserves: rethinking upstream offers by international oil companies, Accenture; Mikal E. Herberg (2007): The rise of Asia's national oil companies, Energy security survey 2007, NBR Special Report No. 14., December 2007, Washington.

*Rawi Abdeal et al. (2008)* conclude<sup>6</sup> in their paper that the countries, companies, including oil companies of the Gulf Cooperation Council are set to rise and change the whole world in the future fundamentally. According to the authors the biggest IOCs are going to play a secondary role in the global energy industry. The key of their survival is technology, this could be the main source of their competitive advantage.

In his paper *Majed A. Al-Moneef (1998)*<sup>7</sup> analyses the strategies of national oil companies with regard to vertical integration. The author reveals that after the 1970s (after the petroleum industry nationalization era) IOCs began to seek upstream assets, whereas NOCs bought/built downstream assets. The core of the strategy of oil companies was to increase vertical integration<sup>8</sup>. Further, the author describes the advantages and disadvantages of vertical integration.

Finally, the author concludes that as the market share of the big oil producers in oil production is expected to rise, demand for refineries fine tuned for their oil is set to increase, as well, therefore an increasing vertical integration of national oil companies of oil exporting countries might be advantageous. However, since the paper was prepared in 1998, it only projected a further vertical integration.

The authors of *Deloitte (2008)* conducted research on the group of national oil companies, as well<sup>9</sup>. According to their paper, NOCs will have to face six main challenges in the future.

- Managing risks, reporting and corporate governance (health, safety and environment, because of their global activities and access to capital markets);
- Replacement of qualified oil industry workforce (aging current employees, people from different cultures working together, employment of local workers);
- Relations with IOCs;
- Financing, their relationship to capital markets, international tax harmonization (as NOCs are increasingly privatized, unlike earlier, it is important how much tax and dividend they pay), oil price volatility in absolute terms and the way of managing it;
- Control of activities far from the headquarter, corporate image, compliance, corporate social responsibility, environment;

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<sup>6</sup> Rawi Abdelal – Ayesha Khan – Tarun Khanna (2008): Where oil-rich nations are placing their bets, in *Harvard Business Review*, September 2008, pp. 119-128.

<sup>7</sup> Majed A. Al-Moneef (1998): Vertical integration strategies of the national oil companies, in *The developing economies*, No. XXXVI-2 (June 1998), pp. 203-222.

<sup>8</sup> The author defines vertical integration as follows: built-in refinery capacity per day / oil production per day (integration ratio).

<sup>9</sup> Deloitte (2008): *Seizing opportunities: A new era for national oil companies*, Dubai.

- Fight against climate change.

The authors argue that national oil companies have to create their strategies on how to handle these challenges and have to find answers to them. Further, the authors point out that NOCs are increasingly internationalizing the portfolio of their assets and activities, increasing vertical integration and seeking financial sources from the global capital markets.

In her paper<sup>10</sup> *Dr. Valerie Marcel (2009)* analyses the investment and financial challenges of NOCs and the answers they give. Her main conclusions are as follows:

- The main goal of the oil companies during the crisis beginning in 2008 was cost saving,
- New reserves are more and more costly to produce (for NOCs with conventional reserves an oil price of at least \$30 per barrel is necessary to start a project, for NOCs with unconventional sources it is \$60 per barrel. If the company has to take even the government budget into account, it is \$80 per barrel.),
- Key is the ability to finance new projects – this could be a source of competitive advantage for IOCs, opening up new opportunities in cooperating with NOCs.

Based on access to capital and operating costs, the author classifies some NOCs. It is revealed that NOCs are increasingly creative in finding new sources of financing (see e.g. loan-for-oil financial products or the idea that an oil company creates a subsidiary in which it outsources assets and this subsidiary takes credit securing it by these assets etc.).

According to the author there are 5 ways in which NOCs access capital. Marcel assigns these ways to several oil companies. For this see the table below.

Figure 1

Financial Sources of Some NOCs					
	Government budget allocation	Retained earnings	Cooperation with foreign partners (PSA, JVs etc.)	Loan and bond markets	Stock markets
Pemex	X			X	
NIOC	X		X	X	
KPC		X			
Saudi Aramco		X			
Petronas		X			
Sonatrach		X	X	X	
Petrobras					X
CNPC (Petrochina, CNOOC)		X		X	X
PDVSA		X	X	X	

Source: Dr. Valerie Marcel (2009): *The national oil company investment challenge*, KPMG, pp. 16-18.

<sup>10</sup> Dr. Valerie Marcel (2009): *The national oil company investment challenge*, KPMG.

The table above helps to decide, to what extent are these companies internationalized. Companies being able to finance themselves from the stock market are presumably more internationalized than their counterparts. However, taking only the financial sources into account is by far not enough to make a decision about the internationalization of the company<sup>11</sup>. For this you need to analyze the expertise in technology, the ability to implement difficult projects alone, the ability of an NOC to provide services, earlier offered solely by IOCs, etc. Consequently, to decide to what extent an NOC pursues an internationalization strategy, Marcel gives some help but – as not this was her goal – it is by far not enough.

In the research of *Ernst&Young (2009)* it is – among others – revealed<sup>12</sup> that the strategy of Petrobras is focused on Brazil: 90% of its capex are expected to be spent in Brazil, mainly on developing its pre-salt formations. But in sum, this paper can be ranged among the papers which deal with the players of the oil market generally, without identifying any oil companies.

In 2007, the *The James A. Baker III Institute for public Policy of the Rice University* conducted research<sup>13</sup> on several national oil companies, their paper cited here sums up the conclusions from the background papers. Its main conclusions are as follows:

- NOCs have noncommercial objectives, too.
- Due to the noncommercial objectives they are not as efficient as they could be.
- Some institutional structures could serve as an incentive for NOCs to be efficient. E.g. the existence of multiple NOCs within one country or the partial privatization of NOCs can enhance competition and efficiency.
- More and more NOCs are accessing capital from the international capital markets. This helps to improve compliance with international standards of corporate responsibility.
- NOCs tend to be mostly involved in upstream activities, while the downstream sector tends to be associated with IOCs. This could be a possible field of cooperation, as NOCs (too) are striving for higher vertical integration.
- Due to the increasing role of NOCs, future global oil production is increasingly affected by noncommercial factors. Consequently, oil importing countries have

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<sup>11</sup> Internationalized national oil company (INOC): we can call companies an INOC if they are able to implement a technologically complex, difficult petroleum industry project (e.g. building an LNG train) without the help of IOCs in financing, technology or project management.

<sup>12</sup> Ernst&Young (2009): Investing for the upturn, Oil and gas companies' investment plans, London.

<sup>13</sup> The James A. Baker III Institute for public Policy of the Rice University (2007): The changing role of national oil companies in international energy markets.

to be prepared for the vulnerability of oil imports. NOCs seek to purchase downstream assets. The costs and benefits of this have to be subject to discussions in importing countries and they have to adjust their energy strategies accordingly.

The background papers of the research have been published, as well, you will find them below. Answers from this paper to our questions include that NOCs tend to look for ways to increase vertical integration.

*David Ledesma (2009)* interviewed<sup>14</sup> managers of several oil and gas corporations. He asked seven questions related mostly to the LNG value chain. The questions and the answers given are as follows:

1. How has the relationship between NOCs and IOCs changed? During the common projects earlier NOCs gained experience and knowledge and recently they seek to make more and more on their own, with a bigger share in the project. They tend to request less from IOCs.
2. What are the key skills that IOCs bring into a project? Risk capital, financing, technical expertise, relationship with LNG customers. In addition, trust, credibility that the project will be carried out, corporate image, best practice, cost efficiency, customers, investment into the country, employment due to local content requirements. For all this, IOCs require something in return, this might create conflicts between the IOC and the NOC.
3. Which companies have done well and which not so well? In the LNG business, oil-focused companies have done not so well as their gas-focused counterparts. That is why Shell and ExxonMobil has done well (Exxon became a gas-expert through the acquisition of Mobil<sup>15</sup>). BG has done well in the US, as well.
4. How important is culture and individual contact vs. more commercial factors? Personal contact is crucial in the LNG business, however, CEO-level trust is of the most importance. Further, it is important that senior level managers negotiate and that they are eligible to make important decisions without the need to make phone calls to the headquarters. Rotation is expressly unsuitable as the relationship between the negotiating partners can not develop. Knowledge and acceptance of the culture of the partner country and of the company is important. However, how an IOC manages its relationships with NOCs is vital, therefore often confidential.
5. What will the role of IOCs be in the future? There is not an accepted IOC role, it depends on the country and the project. IOCs itself have to explore what the NOC aims at and not how the project benefits the IOC.

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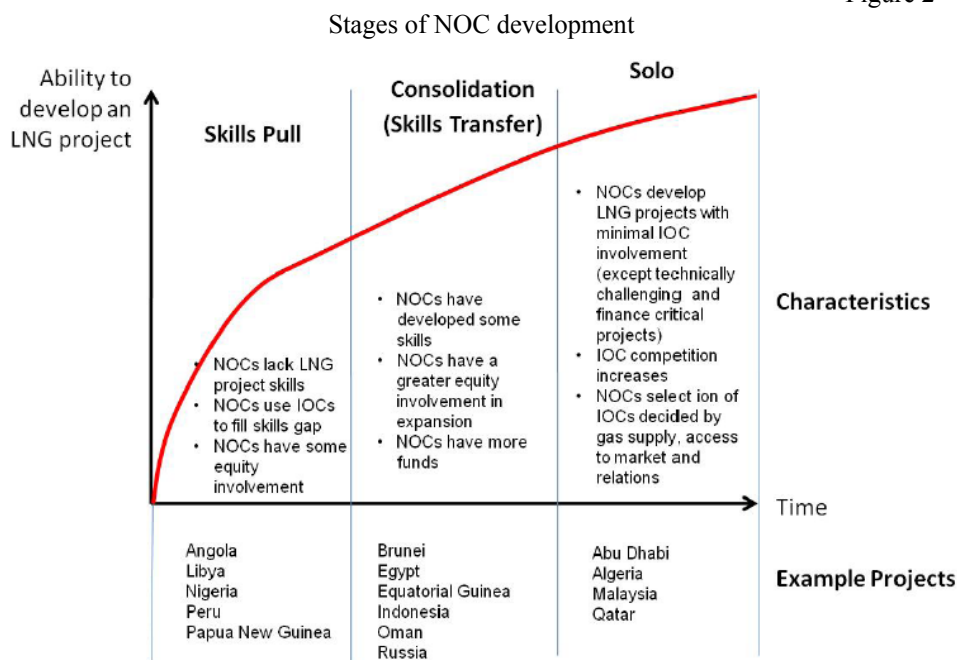
<sup>14</sup> David Ledesma (2009): The changing relationship between NOCs and IOCs in the LNG chain, Oxford Institute for Energy Studies, July 2009, NG 32.

<sup>15</sup> The acquisition of XTO did not yet mean a real advantage in this / at that time.

6. Will NOCs operate without IOCs? In the near future, no, they will not because 20-25 years of experience are necessary for being active in the LNG business and NOCs do not have it yet. However, more and more NOC-NOC relationships emerge. Crucial is whether they can show up enough expertise, customers and financial sources. Many times, NOCs choose those IOCs for partner with which they already have worked together (Brunei: Shell) but it is not always the case (Qatar: involvement of ConocoPhillips and Shell). Even a deliberate diversification of partners can occur. In times of low oil and gas prices NOCs are in stronger need for IOCs.
7. Does the focus by NOCs on the domestic market reduce the role of IOCs? Yes, perhaps. NOCs are able to build a power or methanol plant using foreign equipment suppliers. Rules in several countries prescribe that part of the produced gas has to be marketed on the local market. This opens up the opportunity that utilities moving into the upstream business and cooperating with NOCs exclude those IOCs from gas projects which earlier served as intermediaries between upstream focused market players and utilities.

Based on their global activities, their expertise and functions in the LNG value chain, the author characterizes some national oil companies. This is drawn in the figure below.

Figure 2



Source: David Ledesma (2009): The changing relationship between NOCs and IOCs in the LNG chain, Oxford Institute for Energy Studies, July 2009, NG 32, pp. 24.

The author shares the view that NOCs first gain competencies from IOCs, then take responsibility for more and more in the LNG value chain and finally make everything by themselves.

According to Ledesma, gas utilities in many countries were state monopolies and they are able to effectively cooperate with NOCs. This could result in the exclusion of IOCs from the LNG business as there is no (need for) IOCs between the gas producing NOC and the gas utility. Ledesma argues that until recently several companies operating in only single elements of the LNG value chain have moved into other parts of the value chain (e.g. RWE). According to the author, the key for the survival of IOCs is that they adjust themselves to the needs of NOCs.

*Isobel Rea (2008)* explains<sup>16</sup> in her paper that in the future IOCs have to modify their bids if they want to be competitive in bidding for oil and gas assets. According to the author's opinion IOCs can learn from NOCs: while making their bids they have to concentrate not only on the oil and gas sectors but on the needs of the host country, as well. In some places they have to build roads, railways, in other places hospitals. However, they have to take their core competencies into account, too, and involve players of industries into the bidding and bring them into the country with which synergies can emerge. Suitable partners therefore could be actors of the chemical, mining, steel, renewable energy industry or electricity utilities.

This could be an advantage while bidding, however, no analysis is available in the paper whether IOCs pursue such a strategy.

According to a research<sup>17</sup> by *Ernst&Young (2008)* it is less and less characteristic for national oil companies that the main area of their activity is their home country.

The authors describe Petronas of Malaysia as an integrated, international, fully state-owned national oil company. The company operates in 33 countries, it has upstream assets in 22 countries and operates downstream assets in more than a dozen of countries (it has gas supply infrastructure and LNG-assets in Europe and Asia). In 2007, 25% of its oil and gas reserves were located outside its home country, 34% of its production came from abroad. In 2006, Petronas bought shares in Rosneft for \$1,1bn, in 2007 it acquired Star Energy Plc. with interests in British gas storage for £354m.

The Chinese CNPC (along with Petrochina) operates in 27 countries. It provides oilfield services, design and engineering services in almost 50 countries. Ahead of ONGC of India and Lukoil of Russia it bought PetroKazakhstan for \$4,18bn in 2005. PetroChina managed to collect \$8,9bn in a public stock offering on the stock exchange of Shanghai. It plans to spend this money on financing upstream and downstream projects in China and abroad.

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<sup>16</sup> Isobel Rea (2008): Accessing oil and gas reserves: rethinking upstream offers by international oil companies, Accenture

<sup>17</sup> Ernst&Young (2008): Are national oil companies the new international oil companies?



The Brazilian national oil company, Petrobras operates in 20 countries and plans to spend \$15bn (13% of its capex) on projects outside its country in 2008-2012. 70% of this amount are assigned to upstream assets. The main focus of its strategy is deepwater drilling and production. In the period mentioned, it plans to spend \$1,3bn on renewables, primarily on the marketing and distribution of biofuels.

Compared to other NOCs, the activities of Gazprom are more concentrated, geographically more focused. It seeks to secure markets for its natural gas, in Europe by building gas pipelines, in Asia by creating alliances. It has upstream assets in Libya, India, Venezuela and Vietnam. Its main research areas however include the arctic regions and continental shelf of Siberia. Through the acquisition of OAO Sibneft and having bought stocks in the electricity focused OAO Mosenergo Gazprom diversified its activities and doubled its oil reserves.

According to the authors, NOCs are new, international NOCs, in other words INOCs. They discuss the challenges emerging during this transition process in detail, and make suggestions how NOCs should overcome them. They describe the driving forces behind the internationalization. They assume that NOCs are going to gather capital from the international financial markets therefore they have to become like IOCs. During this process they will become more transparent and will behave like real IOCs.

In our view, the authors analyze a pretty short time period and underpin their opinion on the strategies of oil corporations with only few data. For instance, it can be disputed that Petrobras is a well internationalized company, as it spends 87% of its capex within the borders of Brazil. Further, the authors do not write about the past of the companies, consequently e.g. the process of geographical diversification could not be proved.

In his paper<sup>18</sup> *Mikkal E. Herberg (2007)* sums up the tenor of a conference in May 2007. According to him, the Asian NOCs are increasingly driven by commercial objectives; government control is complex and country- or rather company-specific. The Chinese NOCs are active globally, the Indian ones regionally. The Japanese ones are weak; their expansion is hampered by several factors. Although the Chinese and Indian firms are in the process of internationalization, the relationships between the home and host countries not necessarily become strategic. According to the author, NOCs will in the meanwhile not become competitors of IOCs as IOCs are even able to carry out complex projects (project management abilities) and their expertise in technology is indispensable for NOCs. Therefore, IOCs are going to determine LNG production, heavy oil production, deepwater production and the development and production of giant offshore gas fields (the gas of which can only be marketed in the form of LNG). However, several Asian oil companies are able to fill the gap created by the flight of IOCs (e.g. from Venezuela), moreover, they are ready to get into operations in countries which, due to an embargo imposed, are inaccessible for Western companies (e.g. Sudan, Myanmar, Iran).

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<sup>18</sup> Mikkal E. Herberg (2007): The rise of Asia's national oil companies, Energy security survey 2007, NBR Special Report No. 14., December 2007, Washington.

Based solely on bidding, IOCs are more successful but as NOCs offer the building of infrastructure and the development of the economy they can grasp oil production rights ahead of the IOCs. NOCs obtain competitive advantages through the cooperation with other industries (steel, power, construction etc.).

In the author's view, NOCs can not replace IOCs as they can not abolish their lag in know-how.

According to us, the activities and the abilities of Petrobras or Petronas do not underpin this view.

Not even *Alexandre M. Oliveira, Melissa Stark, Claire Lawrie (2006)*<sup>19</sup> share the view of Herberg. Although they show that once IOCs were the partner of choice for resource holder NOCs because IOCs were able to carry out technologically new and groundbreaking oil and gas projects. However, in the decade before 2006 things changed. In many cases, oil services companies became the owners of technology and even the capabilities of many NOCs grew. IOCs therefore became to some extent replaceable. In addition, NOCs became increasingly internationalized and also consortia of NOCs emerged. As a consequence, IOCs have to work on a more competitive market; not only IOCs but also NOCs wish a share from oil and gas resources: they also take part on biddings offered by resource-rich countries.

According to the research and interviews made by the authors, the objectives of NOCs are quite different: the top three priorities of individual NOCs are never the same. Therefore, IOCs not only have to offer technological expertise but they also have to have in-depth knowledge on the host country the NOC is focused on.

It is more often that between the NOCs emerge long-term relationships whereas NOC-IOC cooperations are transaction-based, short-term and this is unfavorable for IOCs. The Chinese CNPC for instance pursues local economic development: it builds power plants, chemical plants, railways and pipelines. IOCs are important for the NOCs because IOCs possess downstream assets and technology, among them LNG, gas-to-liquid, different EOR technologies, knowledge on non-conventional oil, ultra deep offshore, renewable energy etc.

According to the Accenture therefore, IOCs can be successful in building good NOC-IOC relationships by keeping in mind the following:

- They gain knowledge on the home country of the NOC.
- They tailor a strategy on the targeted NOC,
- They integrate vertically because high vertical integration can be attractive for the NOC (having downstream assets opens up opportunities for upstream-

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<sup>19</sup> Alexandre M. Oliveira, Melissa Stark, Claire Lawrie (2006): The rise of the national oil company, Accenture.

downstream (NOC-IOC respectively) asset swaps through which NOCs can enter in new markets and gain knowledge on new technologies),

- They broaden local content (skills development, local suppliers),
- They remain leaders in technology (GTL, hydrogen etc.) and excel in the management of complex projects.

Also these authors refer to NOCs and IOCs as homogenous groups, the correctness of which is highly disputable.

As you can see, many of the papers above study the cooperation between NOCs and IOCs, why it is cooperation advantageous for them, how IOCs should behave in order to build a fruitful relationship with NOCs, how to modify their bids etc. However, according to our opinion, the group of IOCs or NOCs is not homogeneous. You can not compare and put into one group for instance Saudi Aramco with CNPC. The company histories are different, their objectives might be different, their views on the future of oil and gas markets might be different and one is resource-rich while the other is resource seeking. Next, PDVSA sets its focus on extra heavy oil, Petrobras on deepwater drilling, ExxonMobil on gas. In addition, setting a focus on something verbally does not mean that the company pursues this strategy successfully. See for instance PDVSA which has several times announced<sup>20</sup> that it was going to develop its gas business but not much has happened until recently.<sup>21</sup>

Further, the authors above rarely underpin their views with detailed data or examples.

### **The Literature on Individual Oil and Gas Companies**

There are only few publicly available papers analyzing the strategies of individual oil companies. For our literature review, we chose ten giant oil and gas companies, both national and international ones. We seek to find answers to our questions analyzing the literature on them.

#### **Petróleos de Venezuela S.A. (PDVSA)**

The country analysis brief<sup>22</sup> (2010) by the *Energy Information Administration* takes a snapshot view on the Venezuelan oil sector. Although the authors describe the tendencies in oil and gas production of the country (and not that of the PDVSA itself) and mention the cooperation of the company with other NOCs, they do not

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<sup>20</sup> See e.g.: Joshua Mellars: South America: A flair for gas, in *Petroleum Economist*, Vol. 67., Iss. 5., May 2000, pp. 30.

<sup>21</sup> Robert Cauclanis: Grand plans crumble, in *Petroleum Economist*, Vol. 75., Iss. 2., February 2008.

<sup>22</sup> EIA (2010): Venezuela, Country analysis briefs, February 2010.

compare them with the past. As the paper is a snapshot, the answers to the questions we raised (strategy between 2000 and 2010) are missing.

*Ramón Espinasa (2009)* reveals in his paper<sup>23</sup> that the oil production of PDVSA was significantly reduced between 1998 and 2008 and states that extra heavy oil production increased but he does not compare this with the past. He completely ignores the natural gas business, foreign activities, international cooperations of PDVSA and its relationships with other oil companies.

*Pascal et al. (2008)* highlight<sup>24</sup> that PDVSA seeks to have a relation with other national oil companies but the authors are not sure whether these companies possess the capabilities necessary to produce the Venezuelan extra heavy oil. Pascal et al. completely ignore about PDVSA's plans in foreign markets and the gas business is left out, as well.

*David Hults (2007)* in his paper<sup>25</sup> concludes that the downstream strategy of PDVSA had not changed between 2000 and 2006 (the end of his research period). After the apertura (opening) process of '90s refineries in foreign countries had not been sold. In contrast with this, cooperation in the upstream sector shifted from international oil companies to national oil companies. Therefore, in 2006 PDVSA had common projects with Enarsa (Argentina), Belarusneft (Belarus), CNPC (China), Petropars (Iran), Gazprom and Lukoil (from Russia), Repsol YPF (Spain), Petrovietnam (Vietnam), Petrobras (Brazil), ONGC (India) and ANCAP (Uruguay). Unfortunately, the author underpins this cooperation with NOCs only with one single example (Magna Reserve project of the Orinoco heavy oil belt). According to us, even if we know that this project is of high importance for PDVSA, it is not enough as only a small portion of PDVSA's oil production came from the Orinoco belt in 2006 and many of the mentioned partnerships related to oil reserves certification and not oil production.

*David R. Mares és Nelson Altamirano (2007)*<sup>26</sup> prepared an excellent paper in which they analyze the history of PDVSA, the financial data of the company available until 2003 and show the strategy pursued by the company until the end of 2006. According to the authors, PDVSA switched its focus to the production of heavy and extra heavy oil in the last years of the research period. In the upstream, the

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<sup>23</sup> Espinasa, Ramón (2009): "The performance of the Venezuelan oil sector 1997-2008: Official vs. international and estimated figures", Center for Hemispheric Policy, University of Miami.

<sup>24</sup> Pascal, Larry B. – Azpurua, Ramon A. (2008): "The Venezuelan oil and gas sector – Are there still opportunities in the era of petronationalism?", in *Latin American Law&Business Report*, Vol. 16., No. 6-7.,

<sup>25</sup> David Hults (2007): "Petróleos de Venezuela, S.A.: The Right-Hand Man of the Government", working paper, No. 70., November 2007, Program on Energy and Sustainable Development, Stanford University, Stanford.

<sup>26</sup> David R. Mares – Nelson Altamirano (2007): "Venezuela's PDVSA and World Energy Markets, Corporate Strategies and Political Factors Determining its Behavior and Influence", The James A. Baker III Institute for Public Policy and the Japan Petroleum Energy Center, Rice University, March 2007.

Venezuelan company seeks to cooperate with national oil companies, mostly with the ones of Chavez-friendly governments (from Latin-America) but the diversification of oil sales is important, as well. Therefore, PDVSA tries to involve Chinese NOCs into Venezuelan heavy oil projects and hopes for new oil export contracts with the Far-Eastern giant. The authors argue that the downstream strategy did not change between 2003 and 2007, PDVSA sold its share in only one US refinery (42,1% share in the Lyondell-CITGO refinery, capacity sold amounts to 109 300 bpd<sup>27</sup>). In this period, PDVSA sought to increase its oil export to Latin-America.

As the paper was prepared in 2007, the authors could follow the company's strategy only until the end of 2006 and were not able to evaluate the new developments in the PDVSA-NOC cooperation.

#### Petrobras

The SWOT-analyses by *Datamonitor (2008)*<sup>28</sup> gives a snapshot view on Petrobras. You can not get any information on how e.g. the production of different energy sources had changed until 2008 or what corporations the Brazilian company cooperates with.

Similarly, the authors of *PennEnergy (2009)* report on the state of affairs in the Brazilian company<sup>29</sup>. According to them, Petrobras is an oil company with an excellent financial performance, and excels in its expertise on deepwater drilling and production. The company has upstream assets mostly in Brazil, its exposition to foreign markets is low. The authors show that Petrobras is involved in the production of renewable energy sources (wind energy), too, moreover, it is a significant producer and exporter of ethanol. The core of its strategy is human capital. The paper helps to understand Petrobras better but it is not enough to answer the main questions of Petrobras' strategy.

#### Petronas

The paper of *Von der Mehden et al. (2007)*<sup>30</sup> reflects to the geographical expansion of Petronas in the upstream and downstream sector. The authors show that the company became internationalized between 1993 and 2007 and began activities in several countries. However, it is not clear, which countries or regions are the main focus, when the company entered the regions or whether these foci had changed

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<sup>27</sup> According to 2003 data, the total refinery capacity of PDVSA reached 3.1 mbpd. Besides this refinery, PDVSA sold its small share (7000 bpd) in a refinery in Antwerp in 2004.

<sup>28</sup> *Datamonitor (2008)*: Petrobras (Petroleo Brasileiro S.A.), Company profile, New York.

<sup>29</sup> *PennEnergy*: Special Report: Pemex, PDVSA, Petrobras: how strategies, results differ, [http://www.pennenergy.com/index/articles/display/8973023650/articles/oil-gas-journal/volume-107/Issue\\_29/General\\_Interest/Special\\_Report\\_Pemex\\_PDVSA\\_Petrobras\\_how\\_strategies\\_results\\_differ.html](http://www.pennenergy.com/index/articles/display/8973023650/articles/oil-gas-journal/volume-107/Issue_29/General_Interest/Special_Report_Pemex_PDVSA_Petrobras_how_strategies_results_differ.html), downloaded: 8th January 2011.

<sup>30</sup> Von der Mehden, Fred R. – Al Troner (2007): *Petronas: A national company with an international vision*, The James A. Baker III Institute for Public Policy, Rice University és Japan Petroleum Energy Center, March 2007.

during the years until 2007. Similarly, there is no information revealed on the cooperation partners of Petronas. The tendencies in the production of energy sources in the last 10 years are missing, too.

#### Saudi Aramco

*Jaffe et al. (2007)* describe the strategy of Saudi Aramco (and its home country) in the right way<sup>31</sup>. The authors show that in the 2000s, Saudi Aramco sought to increase its natural gas production, however, at the same time it planned to significantly rise its oil production capacity, too. You get to know that Saudi Aramco's main objective in the 90s was to diversify its customer base. At that time, its vertical integration (downstream expansion) increased but remained low. The research of the authors covered a period until the end of 2006 and thus could partially answer our questions concerning the period between 2000-2010.

The paper of *Yoshikazu Kobayashi (2007)*<sup>32</sup> reinforces the view of Jaffe et al. According to him, the main objectives of Saudi Aramco until 2006 were to enhance oil production capacity, to expand its downstream operations locally and internationally, to develop the gas business and to enhance its operations in the petrochemical sector.

*Valerie Marcel (2006)* finished her research one year earlier, at the end of 2005, and in her book, *Oil Titans*<sup>33</sup>, she agreed with the views of the two authors above.

The papers mentioned here give answers to our questions concerning a period until 2006. Further research is therefore necessary to figure out the strategy of Saudi Aramco after 2006.

#### National Iranian Oil Company (NIOC)

*Valerie Marcel (2006)* shows in her book (see above) that although the National Iranian Oil Company (NIOC) increased the share of its foreign downstream interests in its total downstream assets in 1993-2003, the foreign downstream expansion was not a priority. In the upstream, NIOC remained an Iran-focused company although Marcel, based on interviews with NIOC managers, expected a change in this. That is why a NIOC subsidiary, Petropars was merged with PetroIran into the new NICO E&P with the task to take part in foreign upstream projects and to gain knowledge and experience in such projects. However, operations of this new subsidiary could not have been analyzed.

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<sup>31</sup> Jaffe, Amy Myers – Ellass, Jareer (2007): Saudi Aramco: National flagship with global responsibilities, The James A. Baker III Institute for Public Policy, Rice University és Japan Petroleum Energy Center, March 2007.

<sup>32</sup> Yoshikazu Kobayashi (2007): Corporate strategies of Saudi Aramco, The James A. Baker III Institute for Public Policy, Rice University és Japan Petroleum Energy Center, March 2007.

<sup>33</sup> Marcel, Valerie (2006): *Oil titans: National oil companies in the Middle East*, Brookings Institution Press, Washington.

*Brumberg et al. (2007)* show in his paper<sup>34</sup> that the top 3 objectives of NIOC in 2002-2006 were the revival of old oil fields, maximization of the gas business and the rise of the Iranian refinery capacity to meet local refined product needs. At that time, Iran invited several foreign (both national and international, among others French, Italian, Japanese, Russian and Chinese) oil companies into the country to explore for oil. The authors in their analysis, however, put emphasis on the relationship of NIOC with policy-makers and the role of the company in Iran, and dealt less with the foreign operations of NIOC.

#### China National Petroleum Corporation (CNPC)

*Yoshikazu Kobayashi (2008)* makes a SWOT-analyses<sup>35</sup> of CNPC in a presentation. He shows that part of CNPC's strategy is a downstream expansion into South-Eastern China. Further plans refer to its global expansion, the downstream gas business and its engagement into the LNG-markets. The author makes it likely that on the medium and long run the company is going to aggressively make acquisitions in foreign upstream assets. Due to his method, SWOT-analyses, he gives a snapshot view of the company, makes projections and does not strive to find the origins of future tendencies in the past. Not even does he describe the tendencies of the past 10 years.

*Datamonitor (2008)* gives a more detailed picture on the foreign expansion of the company (CNPC), among others about the beginning of upstream (deep offshore) operations in Myanmar and the acquisition of upstream interests in Venezuela<sup>36</sup>. The authors conclude that these contracts assure that the company can increase its oil and gas production and make it possible to successfully pursue its strategy based on meeting the increased refined product needs of the Chinese market. However, in our understanding the authors do not correctly underpin their view: the exploration of the history of the company and the past tendencies characteristic for it is missing; further, we do not get a picture about whether CNPC is an oil or gas-focused company and whether this focus had changed in the years until 2008.

The paper of *Steven W. Lewis (2007)*<sup>37</sup> gives an analysis about how the growth of the three Chinese oil companies (CNPC, Sinopec and CNOOC) was affected by Chinese political, economic and social institutions. The author analyses the internal (Chinese) motivations of the „going abroad” strategy. The author describes the downstream integration (ordered by the government) and foreign expansion of the company but does not give a complete picture about it.

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<sup>34</sup> Brumberg, Daniel – Ahrum, Ariel I. (2007): The National Iranian Oil Company in Iranian politics, The James A. Baker III Institute for Public Policy, Rice University and the Japan Petroleum Energy Center, March 2007.

<sup>35</sup> Yoshikazu Kobayashi (2008): Chinese NOCs' corporate strategies, 17<sup>th</sup> September 2008, downloaded: 10th November 2010.

<sup>36</sup> Datamonitor (2008): China National Petroleum Corporation (CNPC), Company profile, 15<sup>th</sup> July 2008.

<sup>37</sup> Steven W. Lewis (2007): Chinese NOCs and world energy markets: CNPC, Sinopec and CNOOC, The James A. Baker III Institute for Public Policy, Rice University and the Japan Petroleum Energy Center, March 2007.

BP, Chevron, ExxonMobil and Royal Dutch Shell

Standard setting books on the international oil companies, such as *The Seven Sisters* or *The Prize*<sup>38</sup> help to understand their operations and strategy. These books are indispensable to answer our questions, however, due to their date of publishing (1975 and 1992 respectively), they are by far not enough.

The analyses made by *Datamonitor* in 2008-2010 give a snapshot view of these companies. However, tendencies, ambitions, objectives can not be read out of them and the strategies of the individual companies do not become distinct from them. However, you will find the company-related parts of the SWOT-analyses in them.

As these companies are listed, you can find several analyses of the strategies of these companies, mostly made by consultancies, investment banks and brokerage firms. However, the papers are never published and accessible for free. You will hardly find any related accessible analyses for free on the internet or in the scientific databases of university libraries and academies of sciences. All in all, you will find few analyses on the company-level strategy of oil and gas industry corporations.

It is much easier to find literature on the strategies of NOCs and IOCs as homogeneous groups, their relations and their expected future cooperations.

## Conclusion

As shown above, in the literature we could only rarely find correct analyses to answer our questions considered strategically. Often, we could find analyses discussing a part of these strategic issues (e.g. foreign expansion of different NOCs), however, rarely attracts attention how the focus of the companies on oil or gas or other energy sources changes, how different companies seek to replace their hydrocarbon reserves and what technology they are developing for this. There is a real lack of literature on the company-level analyses of petroleum industry corporations, it is rarely discussed where oil companies place their upstream or downstream assets, or more importantly, how the geographic distribution of these assets changed recently.

Consequently, it is necessary to conduct research on the question raised. This could help to understand how oil and gas companies see the future of the oil industry, what they think the energy source of the future will be and what are the main challenges for the petroleum industry. Through the understanding of the interests of different companies, policy makers could more easily figure out the objectives of oil companies from emerging markets, which could alleviate the mistrust towards them. Politicians might get to know that these companies are not enemies undermining national energy security goals, but potential cooperation partners of the future.

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<sup>38</sup> Anthony Sampson (1975) *The Seven sisters, The great oil companies & the world they shaped*, The Viking Press, New York and Daniel Yergin (1992): *The Prize, The epic quest for oil, money & power*, Free Press, New York.



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