

The Transnational Dimension of Energy Geopolitics
Expansion and Integration of non-triad National Oil Companies

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Abstract

This paper addresses the recent shift in power in the global energy market towards the state-owned energy companies, and the re-nationalising and re-politicising trend that is perceived to have accompanied this shift. This is done by a longitudinal exploratory social network analysis of the changing corporate relations of five major state-owned energy companies from outside the Triad (i.e. US, EU, Japan) over the last ten years (1997-2007). The argument that underpins this approach is that all important changes that impact upon the balance of power in the global energy sector, such as price fluctuations, geopolitical tensions, changes in supply and demand, energy security, and financial crises, are *mediated* by the underlying relations of the main actors in the global energy sector. The findings in this paper indicate that alongside the dimension of re-nationalisation and re-politicisation that is frequently highlighted and emphasised in both academia and politics, the last ten years has also seen an increased *integration* between state owned- and private energy companies in terms of corporate relations. The latter implies both an increased integration between triad and non-triad actors and an increase in the *transnational dimension*. It is this aspect that might be the most important and fundamental aspect of the recent shift in the balance of power within the global energy market, also in comparison to earlier shifts. Whereas previously the contestation over energy resources could be framed as OPEC vs. the West, or the private vs. the state owned oil majors, the distribution of power now seems to become increasingly diffused, as the non-triad state-owned energy companies are progressively integrating into the global energy market.

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I - INTRODUCTION

Recently, there has been much discussion about the alleged rise of the state-owned energy companies, the so called National Oil Companies (NOCs) (Jaffe et al 2007; Stevens 2008; Wälde 2008; Vivoda 2009). Empowered by a high oil price, depleting reserves in the West, and an exponentially growing demand, in particular from Asia, it seemed that the balance of power was tipping towards the state-owned energy majors, often, but not always, coming from the net-exporting states. In combination with growing awareness about climate change this development has markedly increased the perception of vulnerability of supply on the part of the net-importers and has put energy security¹ centre stage of (geo)political contestation, thereby firmly reinforcing the role of the state in energy affairs (e.g. Hoogeveen & Perlot 2005; Van der Linde 2005; Correljé and Van der Linde 2006; Helm 2005; CIEP 2004). In stark contrast with the neo-liberal trend of the 90s - in which the global energy sector was increasingly liberalised and deregulated - influential analysts in the field hence predicted a return to state-governed and increasingly nationalised energy sectors (e.g. Odell 2006). This development also led to a resurgence of academic and public interest in the geopolitics of energy and so called 'resource wars' (Klare 2001, 2004; Stokes 2007).

But to what extent does this really constitute a fundamental shift and what kind of shift is it? The state-owned energy majors have together possessed about 90%-80% of the world's oil and gas reserves for decades (e.g. Wolf 2008) and when oil prices are high and the market is tight this obviously gives more power to the 'haves' than to the 'have-nots', i.e. a high price shifts value to the net-producers from the net-consumers and vice-versa (e.g. Bridge 2008, Wilson 1987). Indeed, since the summer of 2008 fortunes again seem to be changing, as the plummeting oil price shifts the power towards the consumers and away from the producers again, and forces OPEC to drastic cuts in supply. In addition, the coinciding global economic crisis seems to have significantly more impact on the National Oil Companies than on the private oil majors, in terms of loss in market capitalization and cash flow (Hoyos 2008).

In fact, these shifts in the balance of power between state-owned oil companies and private oil majors are a recurrent feature in the history of the global oil sector (e.g. Yergin 1991). In the era of the so called 'Seven Sisters' the western international oil majors dominated the global energy market.² This domination lasted until the nationalisation wave, which started in the Middle East around the mid-50s, resulted in the oil rich states recapturing their own resources, and establishing OPEC in 1960. The balance of power in the following period was shared between the private majors of the West and

¹ Energy security is generally defined as the availability of energy at all times in various forms, in sufficient quantities, and at reasonable and / or affordable prices (CIEP 2004:37).

² The Seven Sisters were, actually, eight western private oil companies: Exxon (Jersey), Mobil (Socony-Vacuum), Chevron (Standard of California), Texaco, Gulf, Royal Dutch / Shell, BP, CFP (See Yergin 1991).

the OPEC-backed NOCs. During the neoliberal era, starting in the 80s and spurred by the end of the Cold War, a new wave of liberalisation and privatisation of energy sectors took place, particularly in the post-Soviet Union states. Again, the International Oil Companies gained the upper hand, until the re-nationalisation wave that has become manifest since the beginning of this millennium. This dynamic of shifting power balances then raises the question how we are to understand the current alleged rise of NOC power. Is it simply a re-run of the 60s-70s? Or is this development of a different making; and in that case, different in what respect?

With the growing interest for energy security and geopolitical contestation there is also an increasing number of studies on the role of National Oil Companies: in-depth case studies (Marcel 2006, Jaffe et. al 2007; Xu 2007), assessments of their performance and efficiency (e.g. Wolf 2008) policy and governance analyses (e.g. Hoogeveen and Perlot, 2005; Van der Linde 2005, 2000) and more general overviews of the trend of their rising influence (Paik et al. 2007; WIR 2005, BCG 2007) (for an extensive overview of the academic literature on NOCs, see Stevens 2004). What is lacking from this magnitude of different studies is a consistent empirical mapping of the *relations between* the National Oil Companies and the International Oil Companies and how these relations have been changing since the turn of the millennium. While there is a general dearth of theoretical studies in the energy politics literature, the few theoretical accounts that exist (e.g. Wilson 1987) stress the importance to take into account prevailing historical conditions. Filling the empirical gap with an account of the changes that have been taking place in this last period between the main corporate actors in the global energy market seems therefore essential in order to better understand how the power shift between them plays out in the current period.

There are two main characteristics that make the current era specific: First, the growing influence of the NOCs takes place in a time and context of unprecedented *transnationalisation* of the global political economy. By transnationalisation is meant interactions and relations across national borders that cut across the public-private divide, i.e. that involve at least one non-state actor (Risse-Kappen 1995). Transnationalisation does however also involve *political processes and structures* that constitute a *social space* transcending national borders (Van Apeldoorn, Nölke and Overbeek 2007: 6-7). The second characteristic that distinguishes this era is the rise of the BRICs³, which implies a geographical shift in economic and political power towards the east, an increasingly multi-polar world system and a drastic increase in energy consumption and demand of hydrocarbon resources. The rise of these new economic powers also generates a whole ‘new’ type of global corporate competitors, in this paper labelled: non-triad Multinational (NTMNCs) (following Nölke et al. 2008). NTMNCs refer to multinational corporations from outside the traditional triad (US, Europe, Japan). The phenomenon of the rising power of NTMNCs has only recently caught the interest of academics and is – as of yet – empirically and theoretically under-researched. These multinational companies are, however, in the

³ This, by now well-known, acronym refers to the emerging economies of: Brazil, Russia, India and China.

midst of a global expansion which is bound to fundamentally transform the global political economy as it existed the last quarter of the 20th century (see WIR 2005, BCG 2007).

What this paper will do is to map out how these two developments play out empirically in the energy sector by looking at the changing corporate relations and strategies of some of the largest non-triad National Oil Companies. The main research question of this paper hence is: *How have the corporate relations and strategies of the non-triad National Oil Companies been changing since the mid-90s?* While the aim and scope of this paper is in first instance an empirical mapping, the explanatory argument underpinning that approach is that all important changes that impact upon the global oil sector - such as price fluctuations, geopolitical tensions, changes in supply and demand, energy security, and financial crises - are mediated by the underlying relations of the main actors in the global oil sector. The proposition that is put forward here is that the real shift that has been taking place is in these underlying *relations*. More specifically it is proposed that alongside the dimension of re-nationalisation and re-politicisation that is frequently highlighted and emphasised in both academia and politics, the last ten years has also seen an increased *integration* between state owned- and private energy companies in terms of corporate relations. The latter implies both an increased integration between triad and non-triad actors and an increase in the *transnational dimension*. More empirical insight into how these underlying relations are configured will enhance our understanding of how the conjunctural changes mentioned above will impact upon the global contestation over energy resources.

The remainder of this paper is structured as follows: the following section aims to conceptualise the shift in the balance of power in the global contestation over energy resources; the next section addresses the main question of how the rise of non-triad NOCs has been taking place in terms of changing corporate relations in the period of 1997-2007. This will be done by a longitudinal social network analysis focused on a selection of the major non-triad NOCs. The last section discusses the main findings and their implications, on the basis of which a future research agenda will be formulated.

II CONCEPTUALISING BALANCE OF POWER IN THE GLOBAL OIL MARKET

2.1 Outlining contestation along the global hydrocarbon value chain

The production process in the global petroleum market is usually divided into three phases: upstream, midstream and downstream. Upstream includes the exploration, drilling and production of oil. Midstream includes transportation and trading to refineries. Downstream includes refining, storage, distribution and marketing to wholesalers and retailers. A crucial part of value creation takes place in the upstream part of the chain, which has to do with the significant character of oil exploration and production – and the extractive industry in general – namely that it provides a way to create and capture value through the enclosure and commodification of ‘non-produced goods’: i.e. material

whose production occurred prior to human intervention (Bridge 2008:16). Much of the contestation over hydrocarbon resources therefore takes place in the upstream sector regarding access or control over those resources and the capture of rent from reserves with high quality and low-cost (Bridge 2008:14). There are two forms of rent distinctive for oil: differential rent, also known as Ricardian rent, which relates to the quality, volume and accessibility of the resource; and ground rent, which is related to the territorially bounded nature of mineral resources (see also Mommer 2002). The latter points directly to the crucial roles that states play in the oil industry. Some have conceptualised the structure of the oil industry as a 'trilateral oligopoly', of producers, consumers and companies (Roncaglia 1985). The conflicting - as well as interdependent - relationship between states and multinational oil companies is, however, a key component of the structure of the oil industry.

States are not only crucial to the state-owned energy companies, but also to the private oil majors and MNCs in general. States need MNCs, for instance, for capital accumulation, and job generation; MNCs need states to provide them with, for example, physical and social infrastructure, and diplomatic protection (Dicken 2007). States and national borders also provide two basic fundamentals for MNCs operations: access to markets and / or resources, and regulation (ibid.). In fact, whereas regulatory mechanisms considerably constrain MNCs behaviour, MNCs need regulation in order to operate, i.e. to guarantee the basic conditions of accumulation. MNCs however not only operate across borders; they also incorporate parts of the host national economy into their organizational boundaries, which can be expected to create tensions and conflict.

In the case of hydrocarbon production, the latter becomes even more intricate since in most cases the state is the owner of the subsurface soil, and thus the minerals it contains. Vice versa, in many cases the energy MNC *is state owned*, which raises suspicions on the part of the host country of political motives behind commercial operations. Two myths should be dismantled here, however, the first myth is that IOCs are non-political and NOCs are political; the second myth is that IOCs abide only by market rules and NOCs are purely instruments of the state. In fact, both IOCs and NOCs are inherently political and both types of companies are subject to global market mechanisms and imperatives, as well as state interests, objectives and strategies. This is the case because of, firstly, the centrality of energy to the global political economy; and secondly, the characteristic of oil as a 'strategic commodity'. Roughly 86 million barrels of oil are moved and consumed around the globe every day; moreover, fossil fuels are the lifeblood of the global transportation and physical mobility infrastructure: virtually all movement of products and people depend upon it, as well as any military apparatus.

Adding to the complexity of the oil industry structure, there is a whole range of non-state actors that have an increasing impact upon the way contestation over hydrocarbon resources is structured, such as energy service companies, international lawyers, banks and financial speculators. Nonetheless, three main categories of actors can be identified between which the contestation over hydrocarbon resources is generally assumed to be taking place: states, National Oil Companies

(NOCs) and International Oil Companies (IOCs).⁴ The focus of this paper will be on NOCs and IOCs and the next section will outline how the contestation between them is conceptualised in this paper. It is, however, well understood that states are inherently part of the picture, not in the last place because National Oil Companies are – at least partly – owned by the state.

2.2 A Relational Approach to Power

In the existing literature the balance of power in the global energy market is structured as a ‘IOCs vs. NOCs’ game, or for that matter: net-importers vs. net-exporters; i.e. the one group of actors is pitched against the other, and when a shift in power takes place IOCs are perceived to lose power to the NOCs, or to the exporting states, and vice versa (Vivoda 2009; Stevens 2008; Jaffe et al 2007; Wilson 1987). This study, in contrast, looks at the *relations between these groups of actors*.

This also highlights a different conceptualisation of power. Most of the existing studies, as well as in the vast amount of commercial energy literature, focus on *economic performance* and *economic power* of the firm, and assess the power balance by comparing the properties and aggregate measures of individual companies or states. This paper, while not discarding the notion of economic power, starts from the idea that power and influence can also be derived from particular relations and positions of firms. Instead of looking at individual properties and aggregate measures of companies, this paper looks at the *relations between them*. The added value of such a ‘relational perspective’ is that, in contrast to comparisons of the individual properties of actors, a relational perspective incorporates the *shared properties* of actors and the *interdependencies* between them. Looking at changes in ownership structures between companies, for example, will give a different insight into the distribution of power between them, than comparing the total amount of production or number of reserves. Taking relations between actors as the ‘unit of analysis’ instead of properties of the individual companies will, I argue, also generate a better understanding of the changes that have been taking place in the last ten years, and crucially reveal more about both the nationalisation and the transnationalisation trend.

Since relations are both constructed by, as well as shaping, agency, I will take a network approach, incorporating the relational aspects at the level of agency with the structural aspects driving change in the global political economy. As Dicken, Kelly, Olds and Yueng (2001:105) put it: ‘networks are both social structures and ongoing processes, which are constituted, transformed and reproduced through asymmetrical and evolving power relations by intentional social actors and their

⁴ It should be noted that using NOCs and IOCs as separate homogenous categories is highly simplifying social and empirical reality: first of all they are extremely heterogeneous categories and, secondly, they are increasingly integrating categories. Yet, precisely in order to clarify these differences and the changes taking place within and between these categories, it is necessary to separate them into distinct categories.

intermediaries'. This study, in that respect, builds further upon a long tradition of network studies of (corporate) power and influence within an increasingly transnational global economy (e.g. Carroll 2009; Carroll and Carson 2003; Carrol and Fennema 2002; Fennema 1982). While Carroll et al. have provided rigorous empirical accounts of a global corporate network and the concept of a transnational capitalist class vis-à-vis national capitalist classes, network analysis has not yet been applied to the energy sector. Nor have the existing network studies incorporated the rise of the non-triad economies - which Carroll and Carson (2003) still identify as the (semi) periphery - and the influence of the non-triad MNCs. In both these respects this study hence has an important contribution to make. Before turning to the network analysis I will however first outline the position of the non-triad NOCs vis-à-vis the IOCs in a more traditional manner.

III THE NETWORK ANALYSIS

3.1 Method and Data

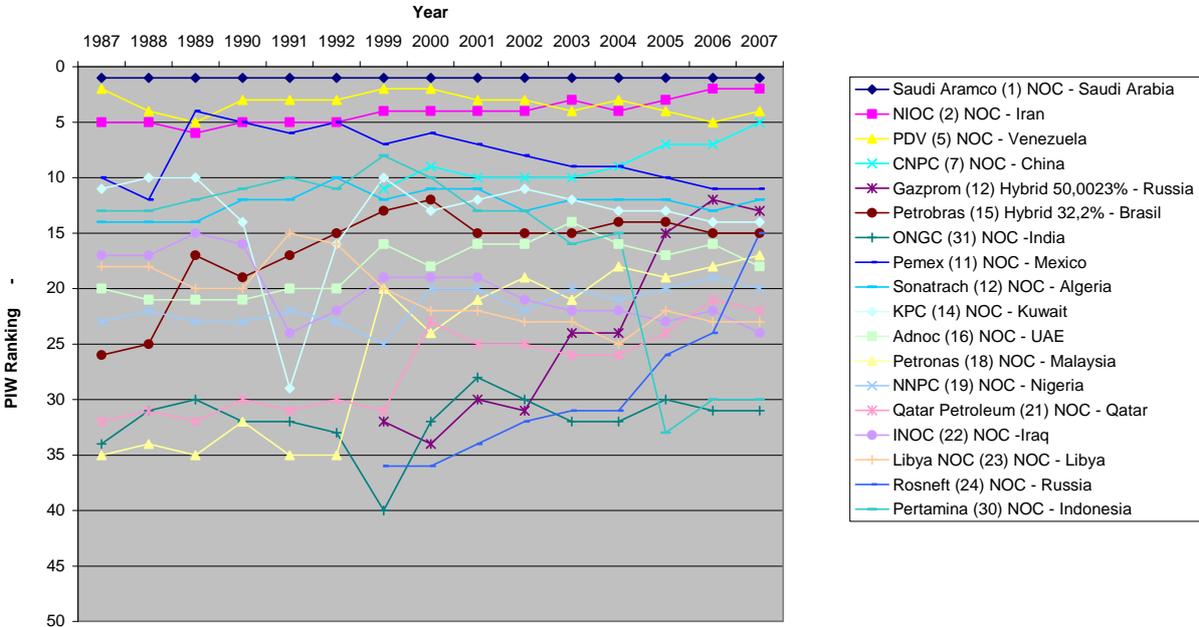
In order to be able to position the changing relations of the non-triad NOCs within the global energy market, the key players of that market will first need to be identified. Deciding which actor is most powerful largely depends upon which properties one looks at. If we look at revenues and profit of companies, the IOCs are clearly more powerful than the NOCs, but in terms of oil and gas reserves and production, the private majors are dwarfed by the NOCs. As point of departure I therefore took the Top 50 of the Petroleum Intelligence Weekly (PIW) annual ranking (Energy Intelligence Group 2008), which is highly recognised and based on operational data from over 130 firms. The specific reason to opt for the PIW ranking, is that their system uses six individual rankings (oil reserves and production, natural gas reserves and output, refinery capacity, and product sales volumes) which are then added together to determine the cumulative, overall position of the firms. This allows for meaningful comparisons of all types of companies (including state owned firms) and differs from more financially oriented corporate rankings. The PIW Top 50 as a result contains a fairly even mix of private and (partly) state owned energy corporations, which together can reasonably be assumed to make up the core of the global energy market.

If we look at the longitudinal development (1987-2007)⁵ of the NOCs and IOCs within the upper half of the PIW Top 50, we find that CNPC, Gazprom, Qatar Petroleum, Petrobras and Petronas have made significant rises, with the Russian Gazprom and Rosneft rising from 32 and 36 to 12 and 15 respectively. But we also see some NOCs losing position (Pertamina, Libya NOC, INOC) and, most importantly, we see that some of these non-triad NOCs (Saudi Aramco, NIOC, PDVSA) have actually

⁵ Data between 1993-1994 and between 1996-1998 are missing but these data are believed to give a sufficient the stable and reliable trend.

been situated around the top five for two decades, with Saudi Aramco holding a steady number one position.

Graph 1a: PIW ranking selected non-triad NOCs 1987-2007

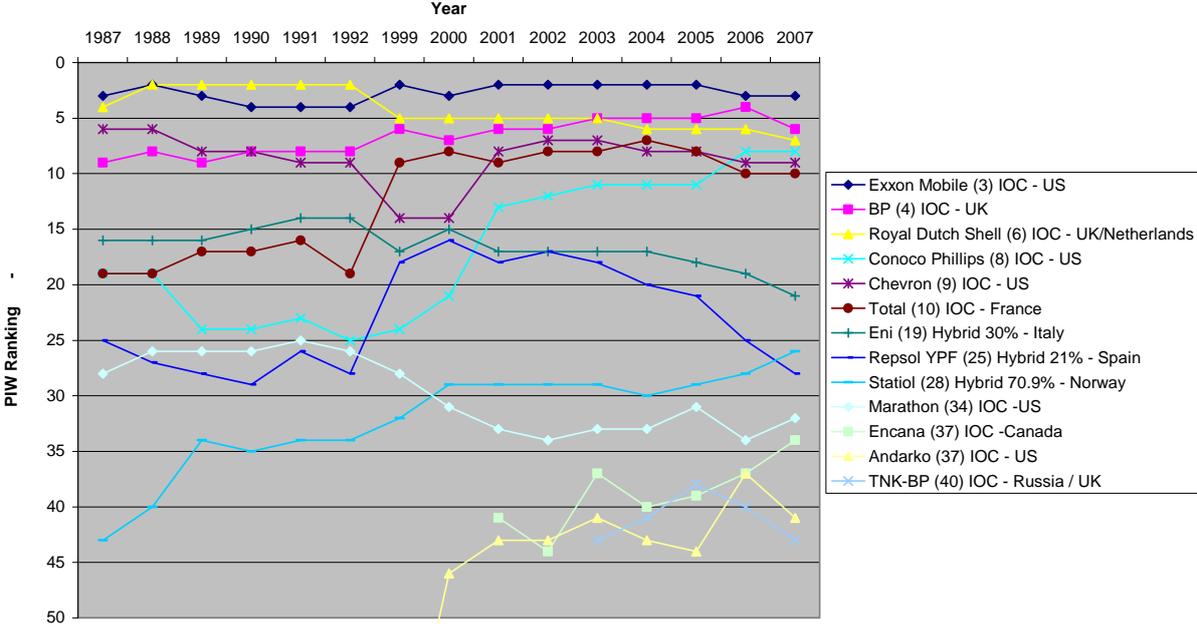


Source: Petroleum Intelligence Weekly, Energy Intelligence Group (1997, 2002, 2008)

In general Graph 1a shows that on the basis of the composite measure of the PIW a significant group of NOCs have had positions within upper half of this ranking, for the last two decades. Compared to the longitudinal development of the IOCs, depicted in Graph 1b below, these display similar variation, although there are fewer examples of a steep rise, a group of IOCs can be seen to have held top positions during the last decades.⁶

⁶ It should be noted that most of these private majors have merged with other IOCs in this period. The latter are not depicted in these graphs.

Graph 1b: PIW ranking selected triad IOCs 1987-2007



Source: Petroleum Intelligence Weekly, Energy Intelligence Group (1997, 2002, 2008)

Whereas these data are illustrative of the NOCs and IOCs positions vis-à-vis each other, and the changes that have been taking place in this respect, they tell us nothing about the *relations between the companies*. Moreover, on the basis of these data, in fact, there seems not to have been so much drastic change in the balance of power between IOCs and NOCs. Apart from some individual examples these graphs do not point to a general ‘rise’ of the NOCs over the past ten years. The proposition of this paper is, however, that there is a whole dimension of change that goes unnoticed by just comparing the properties and performance measures of the individual companies: different kind of relations that might exist between companies, different kind of investments along the value chain, different geographical distribution of the investments, different ownership structures - both within companies and between companies-, all of which might imply changes in *influence* and *control* with respect to the global contestation over energy resources that stretches beyond changes in the properties of individual companies. In order to see how changes in these kinds of power relations in the global energy sector are taking place, we need to identify the actors in the networks, their ongoing relations and the structural outcomes of these relations. I will therefore provide an in-depth mapping of the relations of five out of these top non-triad NOCs from the most important regions in terms of their hydrocarbon resources and / or geopolitical impact: Saudi Aramco (Saudi Arabia, 100% state-owned), National Iranian Oil Company (NIOC) (Iran, 100% state-owned), Gazprom (Russia 50.00% state-owned), China National Petroleum Company (China, 100% state-owned), PDVSA (Venezuela, 100%

stateowned).⁷ In 2007 all these companies were ranked in the top 10 of the PIW, except for Gazprom which was ranked 12th. In order to cover the changes the networks will be compared at two instances: in 1997 and 2007. The particular timeframe was chosen because the most significant changes are expected to have been taking place since the turn of the millennium.

For this analysis social network analysis (SNA) will be employed. SNA, while allowing for quantitative analysis, is investigative in character and not primarily confined to hypothesis testing by means of statistical models (De Nooy eds. 2005). The distinctive feature of Social Network Analysis (SNA) is that instead of focusing on the units (actors) of the system and comparing their attributes it focuses on the (social) relations among those units (actors) (Wasserman and Faust 1994; Scott 1991). Hence it allows for an analysis of how individual or collective *agency* is embedded in and at the same time *constructs social structure*. The software programme UCINET (Borgatti, Everett, and Freeman 2002) was used to perform the analyses.

Data was collected first of all from annual reports of the companies, which was later cross-checked and extended with data from the companies' websites. The latter are an increasingly rich and reliable source for energy-resource data (see Arnott 2004)⁸. Other data sources were: company data bases (as Hoover's and Business week); the extensive energy statistical data bases of organisations as the US governments Energy Information Administration (EIA), the International Energy Agency (IEA), OPEC, annual publications of BP and Shell, UN World Investment Reports (WIR), the Boston Consultancy Group report of 2008 and Energy Intelligence Group reports (EIG) and PIW publications.

3.2. Mapping out the non-triad NOCs Network – Expansion and Integration

To start with, all the 'ego networks' of Saudi Aramco, NIOC, PDVSA, CNPC and Gazprom were mapped, which in this case means that for each of these companies all the external corporate relations were charted: joint-ventures (domestic and abroad), wholly-owned subsidiaries (abroad), consortia (domestic and abroad), equity interests / alliances (domestic and abroad), different forms of operating and service contract agreements, and other relations such as lease contracts and memorandum of

⁷ The term 'National Oil Companies' might be a bit confusing since it does not seem to include other forms of hydrocarbons such as gas, but it is the most generally used term in the literature to denote the majority state-owned energy companies, to which I therefore stick in this article. In spite of its name, Gazprom, therefore also falls within this category.

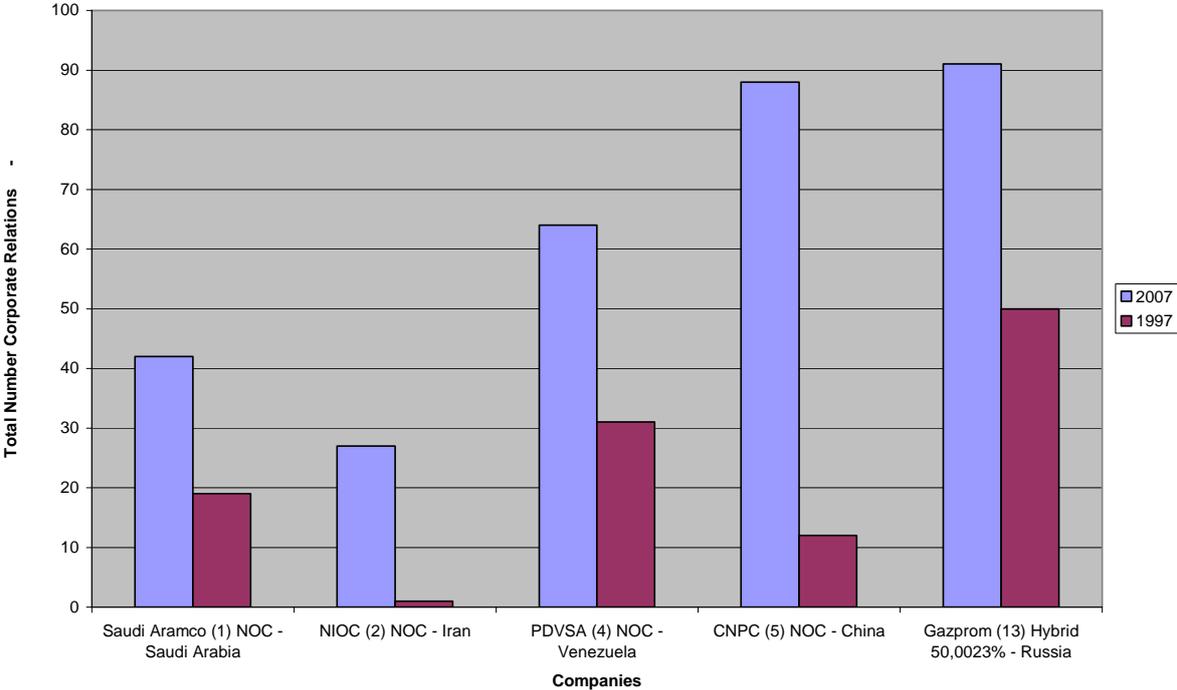
⁸ Whereas previously NOCs were known for their secrecy, lack of transparency and inaccessibility of data the internet revolution has contributed to a significant change in this respect. Most NOCs have their own websites with an English variant and provide annual reports, financial statements, organisational structures, historical developments and important events, subsidiaries and board representations etc on these websites (see for an analysis of this transformation Arnott 2004).

understandings.⁹ When applicable, the ownership structures of these relations will be included as well, in terms of the percentage of the different participating actors' stake in the relation. It should be noted that the companies are analysed as unitary actors, hence relations within companies, or relations between companies at the level of interlocking directorates, were not included.

When mapping the relations of the top five non-triad NOCs, a distinction was made between those relations involving an affiliation with a company belonging to the PIW 50 core of the global energy market, and relations involving an affiliation with companies outside the PIW 50 core. Furthermore, apart from the distinction between fully state-owned companies (NOCs) and fully private companies (IOCs), a third category was distinguished: the 'Hybrid' companies, which refers to partly state-owned companies, ranging from minority to majority owned. In sum, this gives five different main types of actors: NOCs, IOCs, Hybrids, State Outsiders and Private Outsiders.

First of all we will look at the aggregated numbers of all the different forms of corporate relations of the five top non-triad NOCs together, and compare the networks that this generates in 1997 and in 2007, respectively. The absolute increase in terms of corporate relations, on the part of the non-triad NOCs can be seen in Figure 1 below.

Figure 1: Total Corporate Relations five top non-triad NOCs 1997-2007



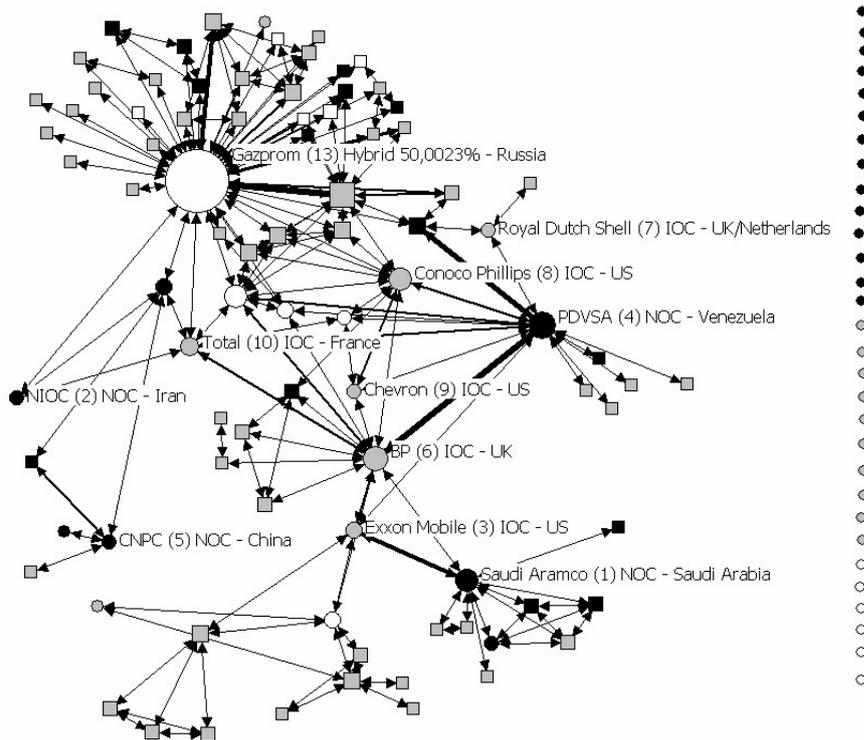
⁹Wholly-owned subsidiaries abroad were also included here, in spite of the fact that they do not involve a relation with another company. The reason for including them was that they do involve a relation with another state (the host). Wholly-owned domestic subsidiaries were not included because these do not directly involve relations with other companies or states. Also not included were the subsidiaries of subsidiaries; while a more complete picture would emerge if these were included, it would also add to the level of complexity.

This figure illustrates the general increase in relations of the five top non-triad NOCs. Although in absolute numbers Gazprom has most corporate relations of this selection, the *increase* in relations over this particular period is most spectacular for CNPC and NIOC, but also PDVSA and Saudi Aramco has seen a significant increase in corporate relations. Whereas this figure shows the aggregate totals of the external corporate relations of the five non-triad NOCs, it does not provide any insight into how this expansion is related to other companies. Graph 2a and 2b below show the network of the non-triad NOC affiliations with actors both within and outside the PIW Top 50 core in 1997 and in 2007. To make the network graphs more orderly, the original two-mode network, which contained both the actors and the projects that connect them - in SNA parlance called 'events' - was transformed into a one-mode network, which shows only the relations between the actors and not the connecting 'events'.¹⁰ The size of the nodes represents the degree; because this is a one-mode network that is in this case the *total number* of relations of each company with any other company through strategic alliances (e.g. joint ventures, equity alliances, contract relations), since each pair can have several relations this is different from Figure 1. The total number of affiliations *between each pair* of companies (actors) is however expressed by the tie strength.

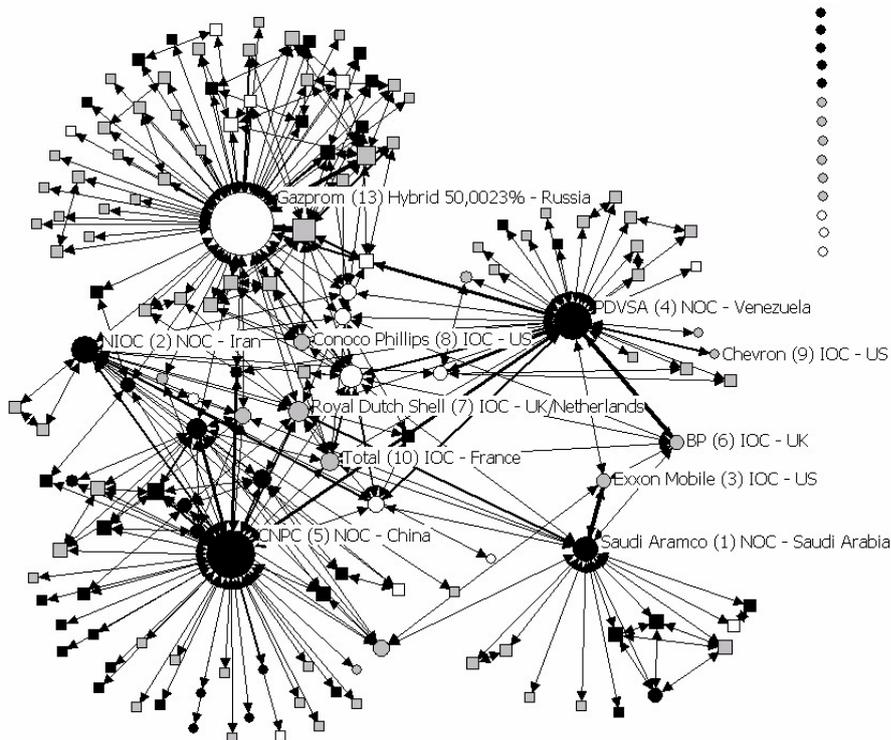
What these graphs show is that the non-triad NOC-network has not only *expanded* in terms of corporate relations, but also that it has become more *integrated* into the core of the global energy sector (the PIW Top 50). The nodes (circles) on the right side of the graph represent the companies of the PIW Top 50 core to which the five major non-triad NOCs (the larger black nodes and the white node for Gazprom) are *not connected* (i.e. isolates), the colour represents the type of company (black is state-owned, white is hybrid, grey is private). The shape of the node indicates whether it is a company inside the Top 50 (circle) or outside (square). The names of the affiliated companies could not be included in these graphs, since it would render them unreadable; to give an indication, the names of the biggest IOCs were, however, given. Comparing Graph 2a and 2b shows that in 1997 thirty out of the forty-five PIW Top 50 companies were not yet connected to the non-triad NOCs and only ten were connected to them. In 2007, however, only fourteen out of the PIW Top 50 companies were *not* connected to five top non-triad NOCs. The important finding here is that, whereas the largest non-triad NOCs have been part of the PIW Top 50 core for decades, they have become significantly more *interrelated* with the other PIW Top 50 companies during last ten years.

¹⁰ The 'events' in this case thus are, for instance, joint ventures, consortia or equity alliances. In a joint venture between, for example, Saudi Aramco and ExxonMobil, the latter are the 'actors', and the joint venture is the 'event'.

Graph 2a: Global non-triad NOC Network (actor affiliation) 1997



Graph 2b: Global non-triad NOC Network (actor affiliation) 2007



Key: Black Circles: NOCs
 Grey Circles: IOCs
 White Circles: Hybrids

Right upper hand: Isolates
 Node degree: Total number affiliations with other actors
 Tie strength: Total number relations between each pair

A more quantitative measure of integration can be obtained by analysing the cohesion of the network; an often used measure in SNA here is the 'geodesic distance'. A 'geodesic distance' is the number of relations involved in the shortest possible path of one actor to another (a direct connection is one path, a connection via another actor is two paths and so further). On the basis of the geodesic distance it could be calculated that the average distance in the non-triad NOC network was less than three paths (2.8) in 2007, compared to and almost three and a half paths (3.3) in 1997. The distance-based cohesion ("Compactness") increased from 0.169 to 0.328 the range is from 0-1, where larger values indicate greater cohesiveness (Social Network Analysis (UCINET): Borgatti, Everett, and Freeman (2002)). Another common way of assessing distance of a network is to look at the diameter, which is given by the largest geodesic distance in the connected network (Hanneman & Riddle 2005), this measure tells us how many steps are necessary 'to get from one side to the other', in 1997 the diameter was seven, whereas in 2007 the diameter was four, which means that the distance between actors in the connected network has decreased significantly over time.

In sum, it can be concluded from these findings that the networks of the five top non-triad NOCs seem to have not only *expanded* over the measured time period, but also significantly *integrated* into the core of the PIW Top 50. The question remains *how* they have expanded and *how* have they integrated. What kind of strategies can be detected behind this process of expansion and integration and what does it tell about the distribution of power between them? It is therefore necessary to *qualify* these relations. This will be done in the following. First, by looking at *strategy*: how has the expansion been taking place geographically and to what extent has vertical integration along the value chain increased? Second, by looking at how power is distributed through *ownership structures* and changes that have been taking place in that respect: what kind of investments are made, to what extent do NOCs have increased access to technology and knowhow, and to what extent do we actually witness an increase in NOC dominated ownership structures?

3.3 Strategies of Geographical Expansion

It is by now commonly established that a global expansion has been taking place on the part of the non-triad NOCs. There is, however, less empirical evidence of how exactly this global expansion is geographically configured and what kind of relations it is made up of. In order to provide such evidence, the home state of each of the affiliated 'events' of the five top non-triad NOCs were mapped and then aggregated into regions. Graphs 3a and 3b below show the regional distribution of the corporate networks of the five non-triad NOCs in 1997 and 2007. The size of the squared nodes (the

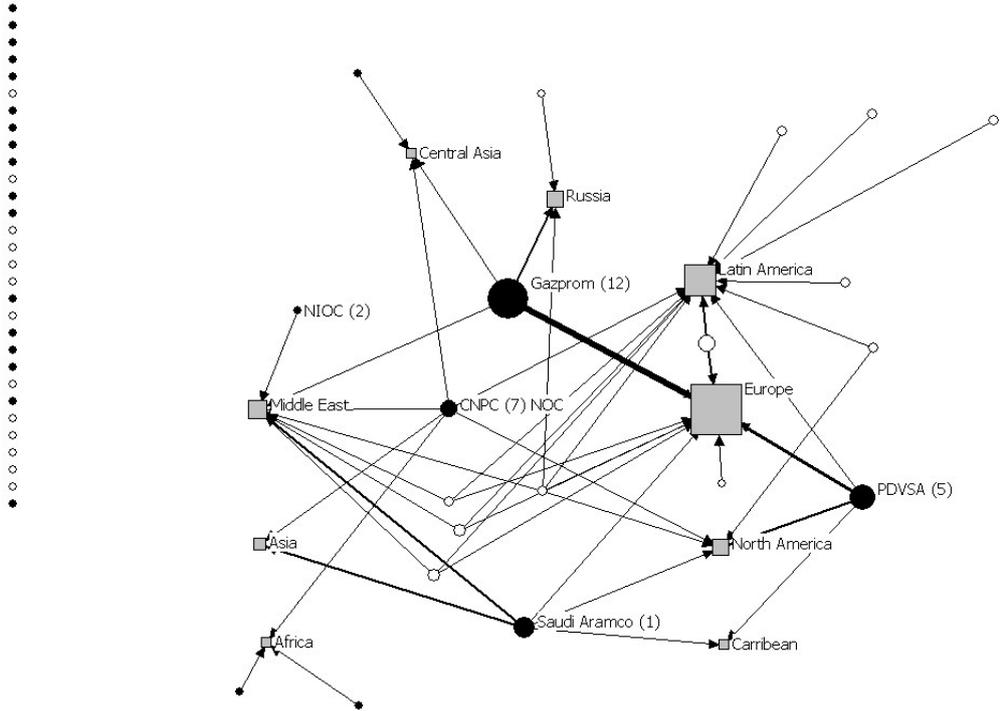
regions) expresses the total number of ‘events’ within this region of the five non-triad NOCs. The tie strength expresses the number of affiliations between each non-triad NOC and this particular region.¹¹

Comparing the networks of 1997 and 2007 confirms the expectations of a remarkable expansion. What the comparison also reveals is, however, again that this expansion of the non-triad NOCs has been taking place, in part, through integration with the PIW Top 50 companies. This is again indicated by the decrease of the isolates: the small nodes in the left upper corner of the graphs. Those are the companies of the PIW Top 50 core that have no affiliation with the NOCs, and - as could be expected on the basis of the findings above - they have become significantly fewer over time: from 30 in 1997, to 14 in 2007. In terms of strategy this means that in general, the expansive strategy of the largest non-triad NOCs is not exclusively unilateral or bilateral, but in fact, involves an increasingly number of joined relations with the other companies from the PIW Top 50.¹² In spite of this general finding there are, however, also significant differences in the strategies of these state-owned majors.

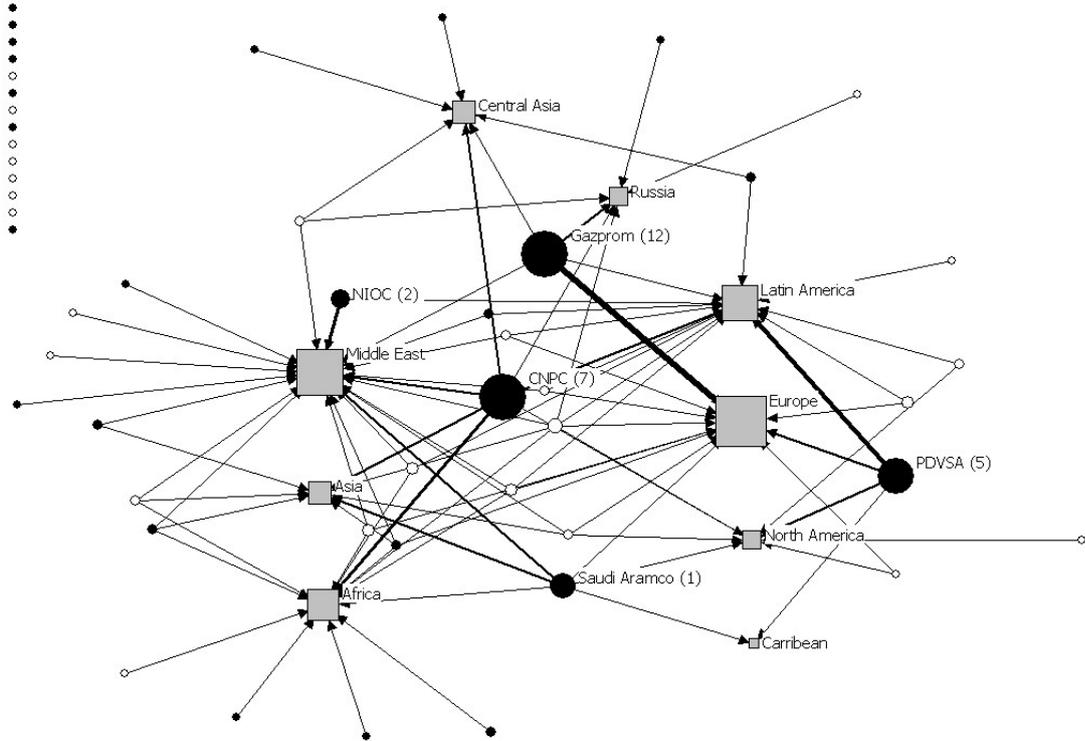
¹¹ Since all relations within a particular region are added up, this graph cannot show how the different companies are joined together within a particular region, e.g. through which joint ventures or strategic alliances. More detailed insight into which companies are affiliated within which regions through what kind of relations could however be provided by looking at the ego networks of the different companies, or by focussing on one region at the time. Since this article analyses a broader trend this will be refrained from, yet it might be an interesting avenue for further research.

¹² To be sure: since only the relations of non-triad NOCs with other companies are mapped, the integration of these companies into the expanding NOCs network implies that this has been taking place by means of *joined relations with NOCs*.

Graph 3a. Geographical Distribution non-triad NOC Network 1997



Graph 3b: Geographical Distribution non-triad NOC Network 2007



Key: Black Circles: NOCs and Hybrids,
 White Circles: IOCs
 Grey Squares: Regions

By comparing the tie strengths something could be learned about the geographical strategies of the individual companies (in order to avoid unnecessary clutter the tie labels are not shown in the graph). *CNPC*, for instance, displays not only a strategy of both geographical diversification and substantive intensification, the most remarkable expansion of *CNPC* is towards Africa (from 2 to 30 affiliations), Central Asia (2 to 20), and Asia (1 to 15), but the *CNPC* has also increased its activities in the Middle East (1 to 10) and Latin America (4 to 10). The expansionary strategy of *NIOC*, in contrast, is highly focused on the Middle East (from 1 affiliation in 1997, to 20 in 2007), with a relatively small diversification towards Latin America. *Gazprom's* strategy is also much more regional than global, focussing on the European region and the region of the Former Soviet Union (Russia and Central Asia). With respect to Europe, in particular, the past ten years have seen a drastic increase: from a total of 37 affiliations in 1997 to a total of 66 in 2007. *Saudi Aramco's* strategy has been to intensify its activities in the Middle East (from 5 to 15) and in Asia (from 9 to 13), whereas their activities in Europe and North America have remained the same (a total of 5 and 6 affiliations respectively). An interesting detail when looking at Saudi Aramco, is the relative high number of affiliations with the Asian region. Comparing the regional affiliations of the *PDVSA* reveals a vast increase in their affiliations with Latin America (from 4 to 36), whereas their affiliations with Europe and North America have remained the same and substantive (12 and 11 respectively). This shift is caused by the re-nationalisation process that started with the restructuring of *PDVSA* in 1997, and culminated in a massive renegotiating of exploration and production contracts (E&P) within Venezuela; turning all operating service agreements with foreign oil companies into joint ventures in which the *PDVSA* had a at least majority interest.

3.4 Strategies of vertical integration and diversification

Another aspect of the expansionist strategies of the NOCs that is often highlighted in the literature is increasing vertical integration, i.e. the expansion along the global hydrocarbon value chain in order to increase their share of the value capture, as well as to make them less dependent on IOCs for technological service and knowhow. Another way to achieve this might be for companies to diversify into non-core activities. In order to assess if this indeed has been the case, the type of investments along the hydrocarbon value chain of the selected non-triad NOCs were categorised, using the common division of: upstream (exploration, drilling & production of oil); midstream: (supply and transport); and downstream: (trading, refining, storage, distribution, marketing to wholesalers and retailers). In addition the categories upstream-to-downstream support services, financial and other services, and non-core activities such as banking and media were added, in order to be able to assess their diversification strategies. This mapping gave the following aggregated figure:

Figure 2: Kind of Investment five top non-triad NOCs 1997-2007

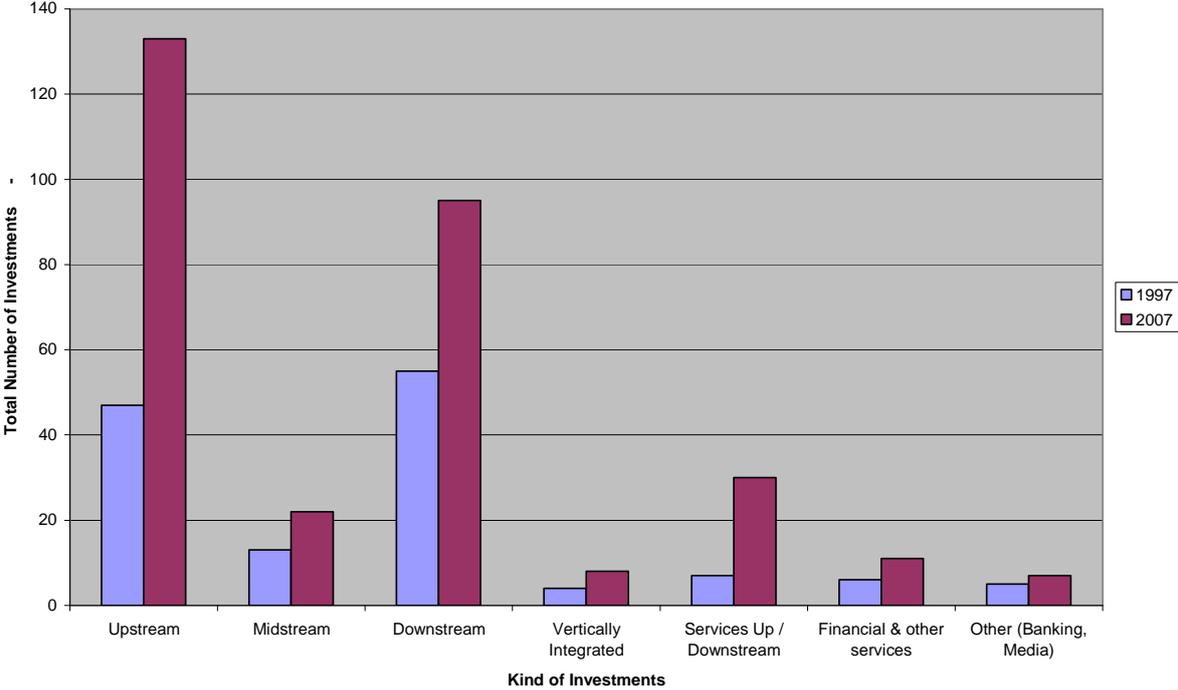


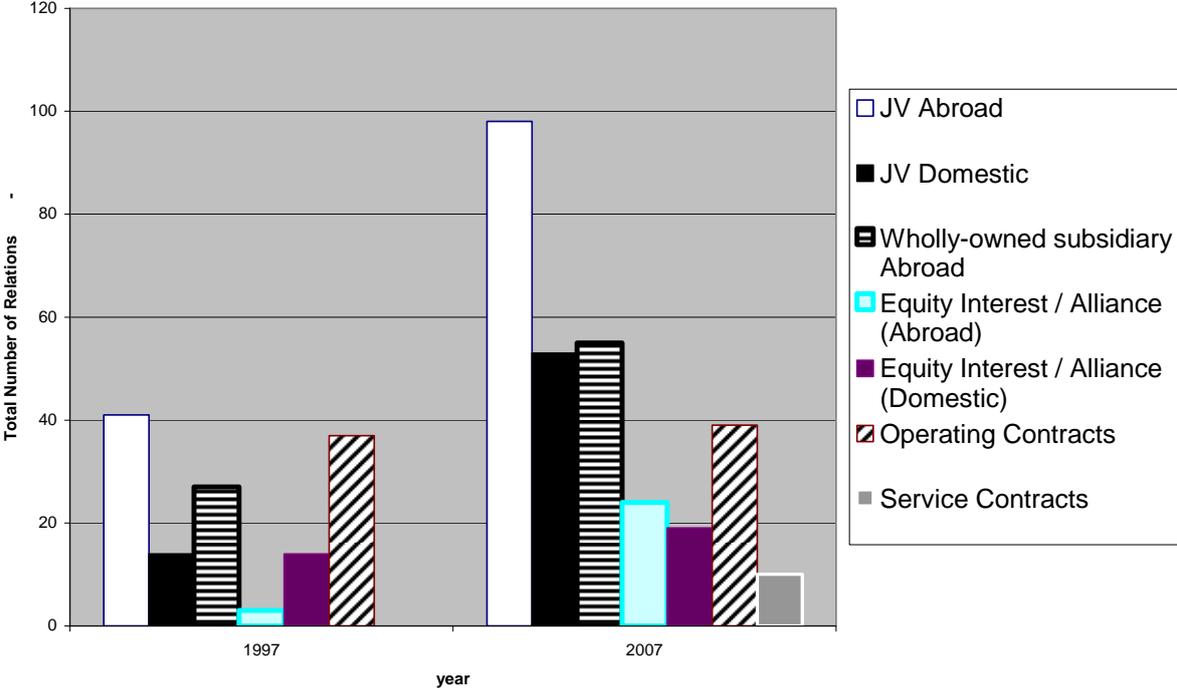
Figure 2 shows that, whereas downstream integration has certainly increased for the five top non-triad NOCs, it has not increased relative to the increase in upstream expansion. This seems to imply that the strategy of vertical integration of these five non-triad NOCs, is not in the first place a downstream integration, but even more an upstream integration. The expectation of a diversification strategy of the non-triad NOCs is confirmed by the increase in services and non-core activities, which is an indication of their increasing independence from IOCs in terms of, for example, technological knowhow and services.

3.5 Ownership structures

Looking at ownership structures is another way of qualifying the relations, by which can be assessed how power is distributed and which changes have been taking place in this respect. The focus is first on cooperative agreements: distinctions were made between *joint ventures* and *equity interest / alliances* (abroad and domestic), *wholly-owned subsidiaries* abroad, and different *forms of contracts* (operating contracts, lease contracts services contracts).¹³ For the five top non-triad NOCs together that gave the following results (see Figure 3 below.)

¹³ Here these different forms of contracts are clustered, for the sake of clarity in the presentation of the graphs, but it should be noted that it differs considerably what kind of contract is made (see e.g. Mommer 2002)

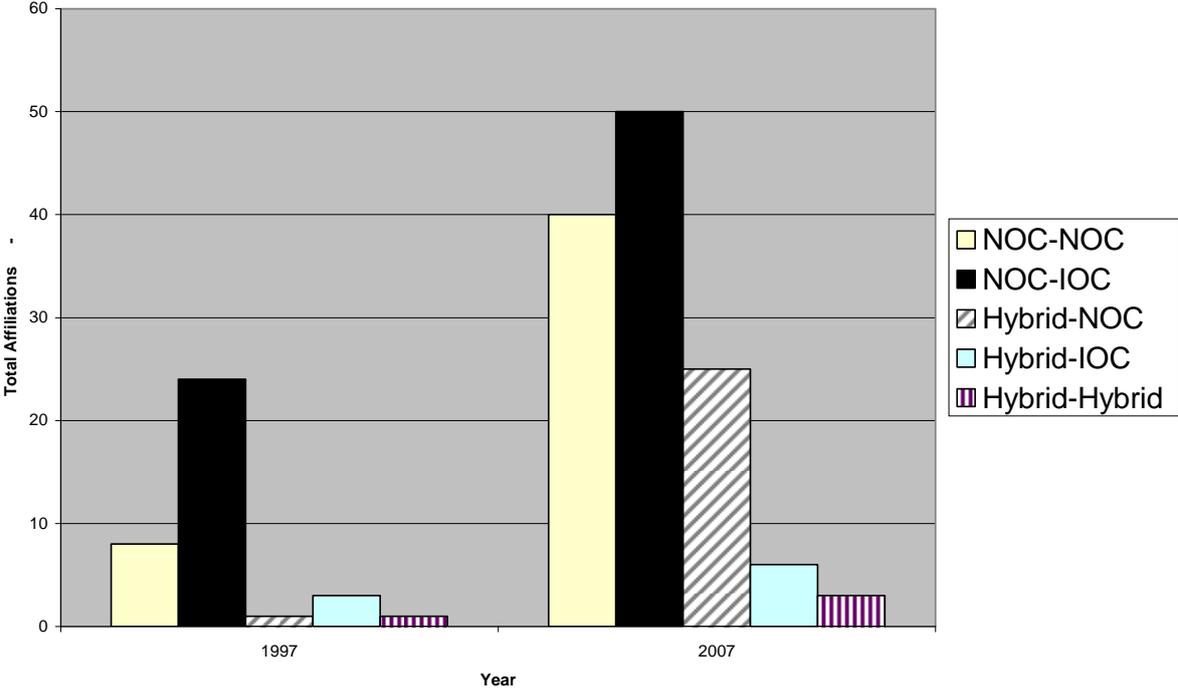
Figure 3: Ownership structures of five top non-triad NOCs 1997-2007



This figure makes clear that the expansion over the period 1997-2007 has taken place in first instance through joint ventures abroad, but also through joint ventures within the home states of the five top non-triad NOCs, which have increased markedly. A great deal of the expansion has also taken place through the increase in equity alliances / interests abroad and wholly-owned subsidiaries abroad, whereas the number of equity alliances at home, as well as the number of operating contracts, have remained roughly similar. An interesting finding is the rise of service contracts of the selected non-triad NOCs, from virtual non-existence in 1997. This, again, confirms the expectation of an increasing vertical integration strategy and diversification strategy on the part of the non-triad NOCs, and indicates a shift in power in terms of the NOCs becoming less dependent on technological knowhow of the IOCs. In fact, it seems that the non-triad NOCs are becoming competitors to the IOCs within a domain that previously was a unique competitive advantage of the latter.

But do the combined findings above imply that indeed the balance of power is tipping towards the NOCs? Is it indeed the case that the resource-rich non-triad states have increasingly nationalised their energy sectors, throwing out the private majors, and that resource seeking non-triad states have send their state-owned majors abroad to capture whatever value they can? Are we witnessing the emergence of a NOC-dominated global energy market, as influential analysts in the field have been predicting? Figure 4 below shows changes in a different kind of ownership structures: the ownership relations of the five top non-triad NOCs with companies the PIW top 50 core.

Figure 4: Type of Ownership-Relations of five top non-triad NOCs 1997-2007



This figure shows that whereas indeed the relations between fully state-owned energy majors (NOC-NOC) has increased significantly, the relations between fully state-owned energy companies and private companies (NOC-IOC) has also more than doubled, and still exceeds the NOC-NOC relations. The relatively largest increase seems to have taken place between the hybrid companies and the state-owned companies (HYBR-NOC). All of this clearly demonstrates that the development of the last ten years is not only one of ‘NOC growth’, but also of increased *cooperation between* and hence *integration of* state-owned companies and private / hybrid companies.

On the basis of the above analyses some general developments over the period 1997-2007 can be identified. There has been a *global expansion* in terms of a significant increase in the number of corporate relations of the non-triad NOCs. This expansion took place primarily through an increase of joint ventures, equity interests, and subsidiaries abroad, and was geographically configured as a significant regional shift towards Asia, Africa and Central Asia, whereas relations with Europe, the Middle East and Latin America intensified. This expansion has however also led to more *integration* of the non-triad actors into the global energy market, not only due to a progressive vertical integration of the state-owned energy corporations along the global hydrocarbon value chain - in terms of increased downstream and upstream integration and the growth of service related activities - but also, significantly so, in terms of the increase in shared ownership relations between NOCs, IOCs, and Hybrids.

IV – CONCLUSION

This paper started out to assess how the corporate relations and strategies of non-triad NOCs have been changing over the past decade. On the basis of the findings presented here it can be concluded that, with respect to the five top non-triad energy companies, the last ten years have seen both a remarkable expansion and a simultaneous integration with the core of the PIW Top 50 companies. This dual development – which is contrasting the commonly held view of simple ‘NOC growth’ – is bound to have important implications for the balance of power in the global energy market and the way in which contestation over energy resources is configured. In the literature this balance of power is often depicted as a NOCs vs. IOCs game (or net-exporters vs. net-importers) and the cyclical nature of power shifts between is explained by the price of oil and forces of demand and supply. This paper took a different approach, by focussing on the underlying *relations between* the different companies, which also generates a different view on the balance of power in the global energy market. The finding that NOCs expansion has taken place, in part, through increasing integration with IOCs, implies that, although NOCs might have ‘gained’ power - a development that indeed in part has been driven by high oil prices - and IOCs might have ‘lost’ power, they have also increasingly *joined forces*. The implication hereof is that they also become increasingly interdependent, in other words, power in the global oil market becomes less and less a zero-sum game.¹⁴

Put in a different manner: these findings show that along side the *resource-nationalism trend*, which was fuelled by the high oil price, a *transnationalisation trend* has taken place, the latter which has significantly transformed the structure of the core of the global oil sector. In comparison to the way earlier shifts in the balance of power in the global energy sector have been depicted in the literature, it is the growing transnational dimension that might be the most important and fundamental aspect of the recent shift. Whereas previously the contestation over energy resources could be framed as OPEC vs. the West, or the IOCs vs. the NOCs, the distribution of power could now become increasingly more diffused, as the NOCs are progressively integrating into the global energy market. This new underlying configuration of relations will also mediate the effects of conjunctural forces - such as a plummeting or rising oil price, loss of revenues, financial crises, changes in supply and demand - in a different manner than when the NOCs were situated more outside, or in counterweight to, the global energy market. Precisely *how* these conjunctural forces will or might impact upon the current configuration has not been the focus of this paper, but more clarity on how these underlying relations have changed might make it easier to assess these matters.

These findings thus set out the agenda for interesting future research: First of all, whereas the focus of this analysis was on the relations of five of the major non-triad NOCs, a similar analysis could be made of the major IOCs. The understanding of changes in corporate relations and strategies

¹⁴ And I would like to thank Anna Leander for making this point explicit in her comments on a previous version of this paper.

of the NOCs, would be greatly enhanced when analysed in combination with the changes taking place in the corporate relations and strategies of the IOCs. Whereas it thus would be very interesting to extend the case selection, fruitful findings could also be generated by focusing on a smaller selection of cases. In spite of the common trajectories of these companies there is, of course, a great variety in strategies and interests present as was revealed when looking at the individual companies geopolitical strategies. More in-depth analysis of these differences could be obtained by having a closer look at the ego networks of these companies.

An important aspect that has been touched upon in this paper, but is not made explicit in the empirical analysis, is the role of the state. As has been addressed, the complex and interdependent relation between states and MNCs is particularly intricate in the realm of energy, because it is such a prime commodity in the global economy, as well as a vital 'strategic commodity' and hence considered crucial to national security. Moreover, the energy sector crucially involves state-owned MNCs. The analysis could be extended to include this state dimension. One way to do this would be to include the relations between those states that are most extensively connected to the network, including, for instance: long term-agreements, alliances, military collaboration / support, financial aid and trade. Another way to proceed would be to open the black box of the corporations and the state and analyse the relations of the actors inside them. Shifting the focus of the analysis to the level of the individual and interlocking directorates, will open up a whole new area of research about the social relations that underlie these power shifts and generate a range of questions to be asked about what strategies and interests are guiding these actors.

A different range of research questions pertain to how shifts in the composition of the global energy network influences the governance of energy markets. It is still an open question in what direction this will proceed; the increased integration between those actors that can be taken to represent a more 'statist' governance regime (i.e. NOCs) and those representative of a 'market based' governance regime (IOCs) could imply that the more 'statist regime' becomes increasingly 'market based', but it might as well imply that the 'market regime' becomes more 'statist' in character, or that the gradual development of more hybrid forms of governance is taking place. In order to gain a better understanding of the implications and meaning of these expected changes, we need to get *inside* these social structures in order to understand what strategies and interests are behind these shifting patterns and how, precisely, this influences governance of global energy markets. Yet, *a qualitative interpretation of the meaning of these patterned relations can only be conducted after these patterns have become visible*. What this article has contributed is an empirical basis for these questions by offering an in-depth mapping of the shifting balance of power within the global contestation over energy resources, which was operationalised in terms of changing corporate relations of non-triad state-owned energy MNCs with the main corporate actors of the global energy market.

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