



EUROPEAN POLICY BRIEF



The changing oil value chain: Implications for security of supply

POLINARES is an EU-funded research project exploring global challenges in the competition for natural resources and proposing new approaches to collaborative solutions.

Ongoing Project

June 2012

INTRODUCTION

A New Market Structure

The overall objectives of the project are to identify the main global challenges relating to competition for access to oil, gas and mineral resources, and to propose new approaches to collaborative solutions for the various policy actors, including the EU.

International oil companies (IOCs) have long played a key role in securing oil supplies for Europe, first through their vertical integration along the supply chain and later through a combination of their active participation in international oil markets and their ownership of refining capacity in Europe.

This favourable situation is now changing. The IOCs are selling many of their oil refineries and instead are concentrating their investment on oil exploration and production and on the natural gas supply chain. Where they do decide to remain active in refining, the IOCs are progressively concentrating their assets in a small number of locations. As the IOCs move out of the downstream sections of the oil value chain, national oil companies (NOCs) are moving in. These NOCs come from oil exporting states and emerging economies such as China.

These changes will have consequences for managing security of oil supply in Europe as well as for balance of payments, industrial capacity and employment.

KEY OBSERVATIONS

The changing role of IOCs

European security of supply has relied on International Oil Companies (IOCs) for a very long time. In the 1950s and 1960s, vertical integration of these companies connected the oil-rich regions in Latin America, Africa and the Middle East, directly to the newly developed refining and distribution centres in the European countries. In the 1970s, the crude oil reserves and production capacities in OPEC countries were largely nationalised and brought under producer country state control, disconnecting the European processing and distribution centres from their main inputs. Markets and international trade replaced the traditional vertical integration along the value chain, introducing many new players into the international market.

Now the structure of the oil value chain is changing again impacting, for instance, the refining capacity in the traditional consuming countries, such as Europe, where low profit margins in simple refinery complexes have forced capacity closures, while other capacities are changing hands. Instead, refining capacities are being built by NOCs in both oil producing countries and new consuming countries, such as China. Moreover, in the 1980s and again now, some producing countries' NOCs are taking over refining capacities to establish access to markets. But this does not alter the fact that the centre of gravity of the refining business has been shifting away from Europe. This change in the location and ownership of refineries will impact the flow of crude oil and oil products. For a long time gasoline exports to the US balanced for a large part the imports of diesel to the European market, but this is changing. Europe increasingly faces a future in which it must import crude oil and more of certain oil products to supply its markets.

In a period where EU policy makers are tightening the regulations on crude oil qualities and are hoping to increase the proportion of biofuels, the existence of a healthy refining industry and blending facilities may be crucial to supply the internal EU market with liquid fuels. This industry is no longer the strong bulwark of the IOCs, who are increasingly focussing on those parts of the oil value chain which yield higher economic rent: namely, the production of crude oil, mostly in the deep offshore, unconventional plays and, increasingly, also the Arctic.

While we see a relative withdrawal of IOCs from the downstream part of the oil value chain, in gas they are moving in an opposite direction. The growing importance of natural gas in the portfolio of IOCs, the position of gas in the power sector, and the increased accessibility to final markets through open gas transport and distribution networks, makes this option increasingly attractive. Both the availability of natural gas reserves and production for IOCs, and the ability to contribute to cleaner growth in countries in Asia and North America, makes this a successful strategy for IOCs. As a consequence, it changes the role of IOCs in the oil value chain and the role of oil in IOCs' strategies.

Impact on security of supply?

OECD consumer countries have continued to rely on IOCs for their security of oil supply. From the 1970s, when oil markets underwent a major structural change, the IOCs were important players in OECD country security of supply strategies. They were not only crucial in redirecting oil flows during the oil embargo, but also took advantage of oil price increases to consolidate their profits in the period thereafter and consequently to direct their investment flows to increase non-OPEC supply. In the period 1985-2000, oil prices remained relatively low in a context of rapid change in the upstream technologies, while producing countries were largely carrying the market adjustment costs. Moreover, the IOCs maintained a strong grip on security of demand for producing countries. With oil demand in the main consumer market largely concentrated in the transportation and petrochemical sectors, the processing and distribution of oil products remained the realm of IOCs.

The question now is if and how the IOCs will continue to play an important role in security of oil supply for the EU in the coming years. This uncertainty appears against the background of, on the one hand, an increasing downstream integration of producer country NOCs into the mid and downstream segments of the value chain in consumer countries and, on the other hand, upstream integration by consumer country NOCs into international oil exploration and production. As a consequence of the change in location and ownership of refining capacity, security of oil supply for the EU will crucially rely on the fluidity and resilience of international markets for oil and gas.

Changing IOC and NOC strategies

From the late 1990s onwards, the IOCs have focussed their international investment strategies on large complex upstream developments around the world, while they have pursued a disinvestment strategy in their downstream activities. They have concentrated and upgraded their assets in refining and petrochemicals into a small number of large integrated refining and petrochemical centres in the US, Europe, the Middle East and Asia. Environmental legislation, efficiency drives, and market and trading policies drove their agenda to rebalance the increasingly lower margin downstream activities and their higher margin upstream activities. From a volume strategy they have evolved to pursue an efficiency or quality strategy in the downstream part of the value chain, leaving bulk production to other players in the market (from pure refiners to NOCs).

For the NOCs from oil and gas exporting countries, the logic of seeking downstream vertical integration into their main consumer markets is becoming more compelling with the development of their human capital and asset base. It allows them to become more familiar with the corresponding political and economic dynamics, including the environmental and decarbonisation dimension. Moreover, they can include these dynamics into their investment strategies, and at the same time include new technologies and fuels into their domestic market strategies.

In contrast, the main investment efforts of the IOCs are or will be upstream, in deep offshore (US, Brazil, Africa), Arctic (US, Canada,

Russia), tar sands (Canada), LNG (Australia, Middle East, Africa), and unconventional oil and gas (US, Europe, Australia, China). The capital costs of these investments have increased substantially, but the return on capital is still expected to outpace that of the mid and downstream parts of the supply chain.

Since the late 1990s, IOCs appear to be retreating to the high rent part of the value chain, and they are seeking those projects where national governments are prepared to leave a larger share of the rents to the companies and allow them more self-regulation. This strategy was jeopardized by the fall out from the Macondo blow out in the US section of the Gulf of Mexico, leading to more government scrutiny and stricter safety regulations for the deep offshore and Arctic activities, while unconventional gas developments have also attracted regulatory attention. In the US, greater government scrutiny has not stopped the development of shale gas and oil shale, while elsewhere, for instance in Europe, some governments quickly (temporarily) stopped investments in these developments.

Foreign NOCs assess EU downstream investments

The upstream emphasis in the investment strategy of IOCs and the rationalisation of transportation, processing and distribution activities have major consequences for the organisation of the value chain and the type of players in each of these segments. In the US, the structure of the industry was always different from that in other markets, with many players present in the various parts of the value chain. In Europe, the IOCs and some larger former European NOCs have dominated the value chain. Other investors are now interested in purchasing part of the current refining capacities, although the maturity of the European oil market and the persistent overcapacities, which are hard to reduce in an orderly fashion, could be a problem. Asian markets offer brighter prospects, but are also harder to enter due to the preference for domestic companies. Producer country NOCs prefer to compete with their own, large and state of the art refineries.

For Europe, the question is whether these NOCs will carry out their downstream integration strategies into the refining and petrochemical sectors. The decarbonisation policies, as explored in the various 2050 roadmaps, create additional uncertainties with regard to the future transport fuel mix and the CO₂ emission costs. The success of the NOCs' vertical integration drive could be reduced by EU energy and climate policymaking. Also, uncertainty about the EU energy market model could make prospective NOC investors hesitant to enter the downstream sector. Nevertheless, some NOCs, from both oil producing states and emerging markets, could consider the decarbonisation of the European energy system as an important development in which they wish to gain experience, while others may deem the time span of the current EU policy plans too optimistic, leaving room for their expansion into the market.

If producer countries' NOCs decide to further invest in Europe's downstream, Europe will develop a stronger connection to the crude oil flows from these countries. This could be an important contribution to future security of supply, but it could also be seen as creating a growing reliance on a few producer countries.

**Implications for Europe:
security of supply, industrial
capacity and employment**

The rationalisation of the refining sector will affect the liquid fuels balance and make Europe more dependent on the import of certain oil products in the future. This is particularly true for the petrochemical industry in Europe. Considering that the European petrochemical industry is entirely naphtha-based, the disappearance of certain refineries could also precipitate the end of production of at least petrochemical intermediates, but quite probably of several finished products as well. The impact on employment and value added is thus potentially much greater than that for refining alone.

It could also have more regionalised repercussions when certain inland capacities end up being closed, and only a few large centres remain. The latter will most likely be on the coast, allowing them to trade in international markets. This could change the European logistic requirements to move oil products to the regional demand centres. Apart from the potential internal oil market consequences of the downstream sector rationalisation now taking place, Europe becomes more reliant on the international oil market for refined products. As long as crude oil and oil products are traded in an international market, apart from the fact that product markets are less liquid, the impact is limited to the balance of payments. In a more politicised world, leading to, for instance, trade restrictions, the impact could be more disruptive as long as oil is the main fuel for the transportation sector.

IOCs have fulfilled an important role in the organisation of the energy system in Europe. After the European NOCs were privatised and the internal energy market established, more players entered the market. The current IOC emphasis on investments in the international upstream and the ongoing rationalisation of the downstream sector does however change their role in the European energy system. They are important suppliers of oil and gas, but by no means the only ones. For policy makers, who often discuss their initiatives with IOCs, the changing make-up of players in the European market implies that NOCs should also be included as important stakeholders in the European energy discussion since they are reconnecting the oil rich regions with the European markets.

RECOMMENDATIONS FOR POLICY-MAKERS

Who to engage in discussions on oil or liquid market policies?

- Given that liquid fuels still play an important part in the European energy mix for decades to come, European policymakers should critically examine their policies with regard to the refining industry in Europe, particularly concerning to the potential regional imbalances within the EU market if the restructuring of the refining industry continues.
 - The EU should assess the impact of the current restructuring of the refining industry and determine how it will affect internal oil product flows, and how it will affect the flow of crude and products to and from Europe.
 - The EU should assess the impact on the petrochemical sector in Europe.
 - The EU should assess the balance of payment consequences of the refining sector restructuring.
 - An assessment of the pipeline network in the EU and the other distribution channels should be made to make sure that the restructuring of the refining industry is fully understood from the perspective of the consequences on regional oil market functioning.
 - In the US, crude oil and oil product markets have been transformed into liquid fuels market assessments. European policy makers should also include biofuels in their analyses of the EU market for liquid fuels. In such an assessment, the capacity for blending and storage facilities should be part of the analysis.
 - The 2050 energy roadmap should also include the energy efficiency potential of cars fuelled by liquids and gases rather than focussing only on electric vehicle potential.
 - The EU should engage with the NOCs willing to invest in the European refining and distribution sector, in order to make sure that the European oil market remains attractive to invest in.
-

RESEARCH PARAMETERS

Objectives of the research

The issue of increased competition and conflict over access to oil, gas and minerals has risen up the political agenda throughout the past decade. The threat of conflict and instability has added urgency to the search for collaborative and cooperative solutions to ensure secure and equitable access to these vital natural resources.

POLINARES has two key goals: first, to identify the main global challenges relating to competition for access to oil, gas and mineral resources; and second, to propose new approaches to collaborative solutions for a range of policy actors in the EU and elsewhere.

The formal objectives of the research are :

1. To develop a better understanding of how global interactions and interdependencies relating to oil, gas and minerals have been changing and are likely to change, and what their implications are for global economic, social, institutional and security relations.
2. To identify principles which can underpin the development of new policies, new policy-making processes, and new networking systems which, in turn, can assist in promoting an appropriate balance between competition and collaboration with respect to access to oil, gas and minerals in a manner which minimises conflict and promotes sustainable economic development.

Scientific approach / methodology

The POLINARES research work plan combines theoretical and empirical analysis to enhance our understanding of the challenges and how they may be addressed. We are examining historical experience going back as far as the 1920s and will look forward to the year 2040. The research is inter-disciplinary, drawing on the fields of international relations, economics, law, political science, geology, resource evaluation, and technology.

PROJECT IDENTITY

Coordinator	University of Dundee , Scotland
Consortium	Clingendael International Energy Programme , Netherlands Bundesanstalt für Geowissenschaften und Rohstoffe , Germany Centre National de la Recherche Scientifique , France ENERDATA , France Raw Materials Group , Sweden University of Westminster , United Kingdom Fondazione Eni Enrico Mattei , Italy Gulf Research Center Foundation , Switzerland The Hague Centre for Strategic Studies , Netherlands Fraunhofer Institute for Systems and Innovation Research , Germany Osrodek Studiow Wschodnich , Poland
European Commission	Domenico Rossetti di Valdalbero e-mail: domenico.rossetti-di-valdalbero@ec.europa.eu
Duration	1 January 2010 – 31 December 2012 (36 months)
Funding Scheme	FP7 Socio-economic Sciences and the Humanities, topic SSH-2009-4.1.1 'Competition and collaboration in access to oil, gas and mineral resources'
Budget	EU contribution: 2,678,642 €
Website	www.polinaires.eu
For more information	polinaires@dundee.ac.uk