



The Changing Relationship between NOCs and IOCs in the LNG Chain

Oxford Institute for Energy Studies

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Preface

The NOC/IOC relationship has become a subject of increasingly intense debate and discussion in the oil and gas community over the past few years. Post-2003 increases in oil and gas prices, availability of technology from service companies, and increased confidence and competence of NOCs, have all contributed to a phenomenon generally known as “resource nationalism”. Many NOCs are not only major international companies in their own right, but also have decades of experience in the development of LNG projects. This has raised the questions as to whether the “old bargain” of allowing IOCs access to gas reserves in return for finance, technology and LNG project management and development skills, will continue to be attractive to NOCs. I was therefore delighted when David Ledesma told me he was interested in investigating the issues of whether, and in which respects, IOCs would continue to be considered essential partners by NOCs in the development of LNG projects. With the huge upsurge of interest in LNG projects on the part of all gas industry stakeholders, this paper is extremely timely.

David’s experience and personal involvement in LNG projects over a long period of time made him an ideal person to interview a group of stakeholders and assess both their views and the rapidly changing nature of the LNG landscape as gas prices soared, and then retreated, during the period over which the study was carried out. I’m grateful to David for taking on this project and seeing it through to a successful conclusion.

Jonathan Stern
Oxford, July 2009

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Objective

The objective of this paper is to examine how relationships between IOCs and NOCs have changed in the development of LNG projects. In the 1960s “NOCs were kings” but the 1970s, 1980s and 1990s saw a greater role for IOCs with more LNG developments and technological challenges. The last ten years have seen the NOC role increase again, together with the involvement of other companies such as utilities, LNG shipping companies and service providers investing in parts of the LNG value chain which are new to them. The paper concludes with some high level actions which IOCs could pursue to maintain and enhance their position with respect to future LNG project developments.

Conclusions

- The relationship between NOCs and IOCs varies depending on the stage of development of an NOC’s gas/LNG business.
- The “Power” of an NOC or IOC depends on the level of resource nationalism in a country and the level of actual or perceived potential gas revenues (influenced by market demand for LNG and prevailing gas prices).
- IOCs bring intellectual rigour, realism, performance culture and, in the early stages of LNG business development, ‘international credibility’ to an NOC.
- NOCs and IOCs may successfully work together where the NOC is able to, in the first place to harness the IOC’s ability to successfully execute a project; and subsequently to absorb this ‘IOC Corporate DNA (skills and culture) into the NOC’s own organisation.
- In addition to the natural tendency for the upstream NOC to ultimately aspire to execute future projects itself, the IOC’s position is also being challenged by destination market gas buyers with whom gas selling countries feel comfortable working.
- LNG shipping companies have extended into different parts of the LNG value chain, developing floating LNG regasification facilities, and service providers have started working direct with NOCs without IOC involvement.
- In order to earn the right to participate in future LNG projects, IOCs will need to recognise these evolutionary trends and NOC aspirations and adapt their approach accordingly.

Structure of the Paper

- Section A provides a background on the positional role of the NOC in the resource country's stewardship and development of its hydrocarbon resource potential-
- Section B collates the responses of key players in the LNG industry to seven key interview questions designed to gather evidence of the changing nature of the IOC-NOC relationship in the LNG business.
- Section C assembles these findings into a framework which facilitates an understanding of the needs and contributions of NOCs and IOCs to the relationship as the LNG business develops.

Readers should bear in mind that the interviews were carried out end 2008/early 2009, after a period of considerable oil and gas price volatility; the paper was finalised in May 2009. When the paper refers to "low prices" it means gas prices below \$4/MMBtu.

Throughout the paper we refer to National Oil Companies (NOCs) and International Oil Companies (IOCs). NOCs and IOCs are the normal industry acronyms, although in many cases the companies should properly be described as National Energy Companies and International Energy Companies.

SECTION A

Introduction

Background

Relationships between National Oil Companies (NOCs) and International Oil Companies (IOCs) have changed over the past twenty years as NOCs have broadened their activities to include exerting greater influence on managing their countries' resources, the selection of which IOCs should participate in LNG projects and more involvement in the development of LNG project structures. In response, IOCs have had to re-focus in order to meet the NOCs' new requirements. The traditional model whereby IOCs managed the development of the whole LNG chain, usually using their own human and financial resources, supported by the NOC, may still be the case for some LNG projects in the early stage of a country's LNG development, but not for the more mature NOCs. When an NOC has gained experience in developing LNG projects, there is a drive by the NOC to have a greater involvement (economic, organisational and physical) in project development and operations, usually resulting in less IOC involvement along the LNG chain. This greater involvement means additional risk to the NOC which some government companies may not wish to take. Some NOCs have therefore been more active in making this move and others, for political reasons, have been slower.

As part of this study, ten representatives from NOCs, IOCs and other involved individuals have been interviewed, to seek their views. Also, attendees at the CWC LNG Summit held in Barcelona in December 2008 were asked for their views as part of a roundtable discussion. Most interviews were with IOCs and other non-NOC organisations, all were conducted under Chatham House rule¹ and responses have been included in this document without attribution to individuals.

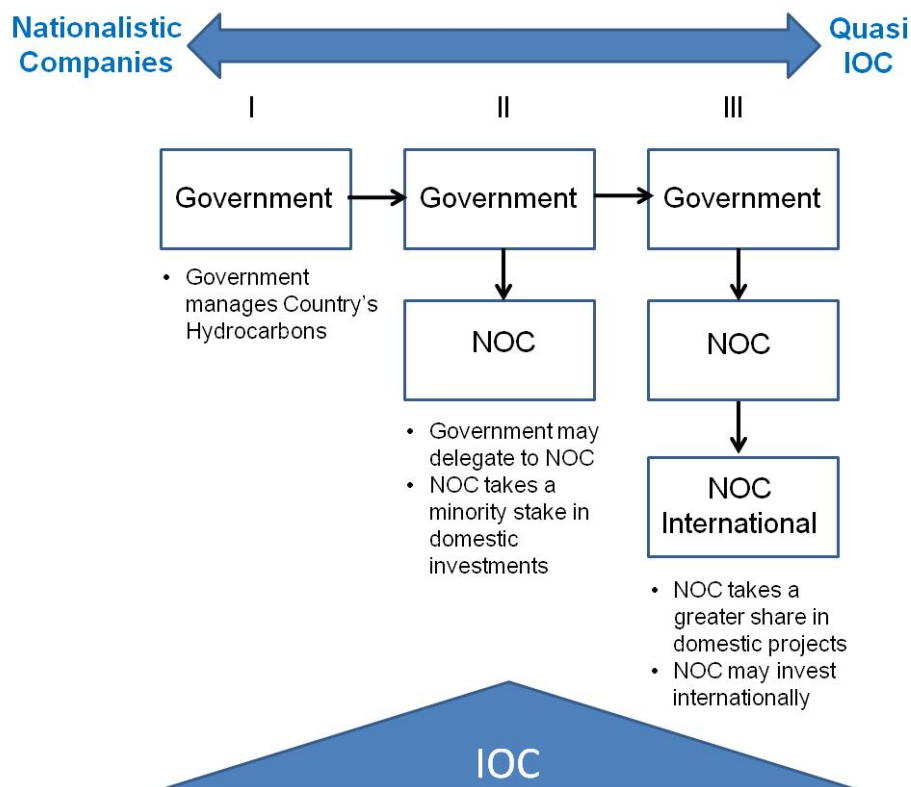
Definitions

Traditionally the government, usually through the Ministry of Petroleum (or Ministry of Oil or Gas), takes the role of managing a country's hydrocarbon resources. Often, as owner of the

¹ Chatham House rule is: "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed".

gas (upstream exploration terms with IOCs usually leave the gas owned by the government not the IOC) the government, with the participation of IOCs, monetises the gas through a domestic or export project.

Figure 1: Stages in NOC Development



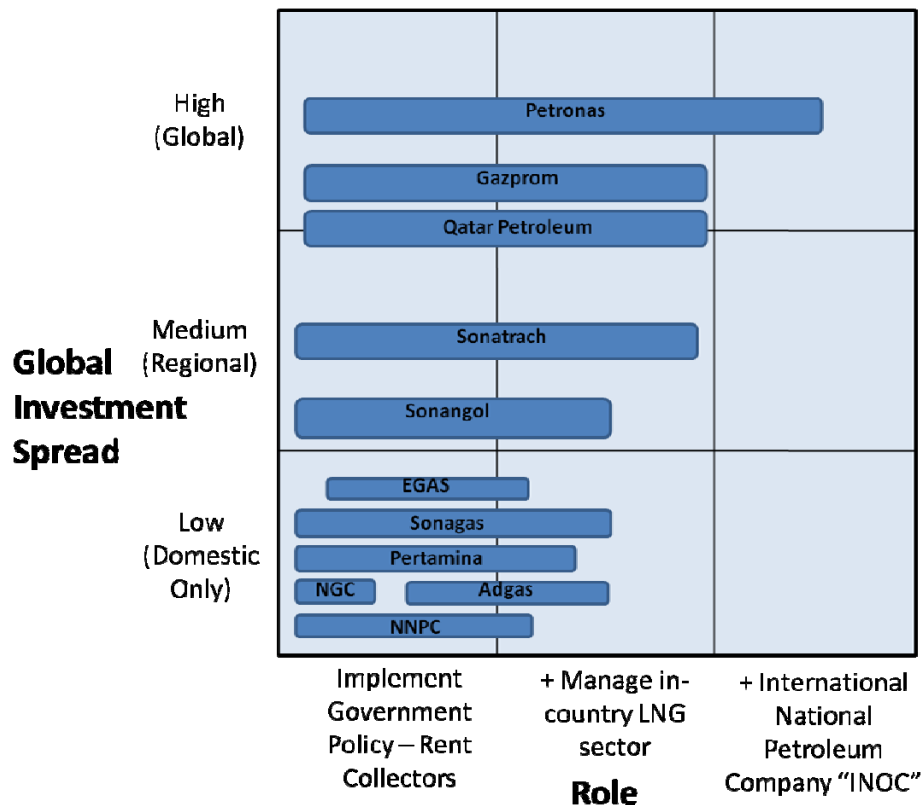
Source: Author

As part of this investment process, the government is most likely to establish an NOC which will take an equity share in the gas value chain, with the areas and level of investment depending on the specific government and their aspirations for the NOC. The NOC may also be given the role of managing the country's gas resources, or alternatively this may remain with the ministry; the NOC only being used as an investment tool (e.g. Qatar Petroleum has the wider role, while in Trinidad and Tobago, NGC² is treated as a commercial company not as the government's resource manager). As NOCs have evolved, governments have used them not only as a means to participate in the development of national resources, but also as international investment vehicles. The degree to which an NOC grows and expands is a function of a government's aspirations, and also the level of risk that the government is willing to take.

² NGC is the National Gas Company of Trinidad and Tobago

Figure 1 broadly shows these stages in NOC development. NOCs range from companies with international as well as domestic investments which almost operate as an IOC (quasi-IOCs), such as Petronas (Malaysia) to companies which seek solely to look after national interests such as PDVSA (Venezuela) and NIOC (Iran). That said, governments do seek to extend the activities of NOCs from domestic to international as a means to diversify energy supply and potentially secure new sources of energy for the future, when domestic supplies may be falling and demand increasing. In the LNG sector, the roles that NOCs take have varied by country, as set out in Figure 2. Some implement government policy and act as “rent collectors”, others have a wider role as manager of the county’s LNG business, and some also act as commercial organisations. NOCs also vary in their global presence. Some focus only on their own country, while others have a regional presence but only Petronas, Qatar Petroleum (QP) and perhaps Gazprom can really be called global organisations. Even then they have a long way to go before they can consider themselves to have developed the ‘IOC’ characteristics associated with the likes of ExxonMobil, Shell or BP.

Figure 2: Snapshot of NOC Activities



Countries: Petronas (Malaysia); Gazprom (Russia); Qatar Petroleum (Qatar); Sonatrach (Algeria); Sonangol (Angola); EGAS (Egypt); Sonagas (Equatorial Guinea); Pertamina (Indonesia); NGC (Trinidad & Tobago); Adgas (Abu Dhabi), NNPC ((Nigeria)

“INOC” = International National Oil Company

Source: Author

SECTION B

Interviews and Discussions

In order to seek input from the industry for this study, seven questions were asked of industry experts to encourage discussion. As noted earlier, all discussions were under Chatham House rules and, where opinions have been given on a company, these are the opinion of the individual concerned, not of the Oxford Institute for Energy Studies, or the author of this paper.

Q1 - How has the IOC relationship changed?

Interviewees' responses to this question varied from "dramatically" to "has anything changed?", but the majority viewed that there had been a substantial change in relationships. Some saw this change as positive, "over time relationships have matured – IOCs and NOCs have grown up together" and "majors are becoming less arrogant – will that trend reverse with lower oil prices?". But others saw the change as negative as IOCs, which used to have access and "rights" to reserves, today no longer have those rights and there are less opportunities for IOC investment. Other comments included that IOCs have "lost their way" as to how to access reserves and are not trusted by NOCs. It was further noted that the way the NOC/IOC relationship has changed depends on the country concerned and relationships between the IOC and the government.

Historically IOCs had three main advantages over NOCs – access to money, technology and LNG buyers, while state-owned companies were viewed as "oil dinosaurs". IOCs therefore went into the gas supply countries and, in the eyes of many NOCs, exploited the reserves and made a lot of money – particularly when developing the first LNG project. Today, available natural gas reserves are increasingly located in countries with more mature NOCs (who therefore need less IOC support or incentives) or countries regarded by some as unstable – so that IOCs have to access resources in countries, and with partners, who may not be preferred by some companies. Some NOCs argue that IOCs are often driven by short-term considerations, while NOCs look longer term. That said some NOCs, guided by political considerations and constitutional rules, also look at the short-term – for example the Mexican government's short-term, cash hungry approach led to chronic under investment in oil and gas business in the 1990s and 2000s³.

In "traditional" LNG developments, IOCs took a share in the joint venture (JV) and the JV sold the LNG to buyers usually on an ex-ship basis. This was the case for Malaysia LNG, Nigeria LNG and Australia's North West Shelf LNG project (even though it was structured as each equity partner selling its own LNG). Under this model, the IOC's rent came from dividends from the joint-venture LNG company. With the changing roles of the NOCs, IOCs have responded by taking positions in their own names in different parts of the LNG value

³ Petroleum Economist, "Scramble for assets goes global", page 4, February 2008.

chain. Newer LNG structures have seen the IOCs buying the LNG and selling it in their own name (or brand) to LNG buyers thus taking the rent in the sales part of the chain (e.g. Trinidad and Egypt). Some NOCs question this role as they see the IOC being effectively a trader rather than bringing end user gas demand to the NOC. NOCs therefore may seek to sell to end users direct. This trend is in parallel with utility end users (such as EoN and RWE) seeking to secure LNG supplies through moving upstream (see discussion later in this paper), not only into the liquefaction plant but also into gas exploration and upstream gas development projects. EoN has a stated intention to cover up to 20% of its gas supplies from its own sources in the long term⁴ with a stated supply strategy based on three pillars: Long-term contracts for piped gas, LNG and E&P⁵. To this end EoN has acquired upstream assets, the British upstream company, Caledonia in 2005 and more recently a stake in the Yuzhno-Russkoye field in Russia from Gazprom as part of the negotiations for the Nordstream gas pipeline.

The pace of change in the NOC/IOC relationship varies by country, but the trend has been one of divergence, as NOCs have sought to gain their independence to develop LNG projects as majority equity holders. NOCs still need IOCs though to access the necessary human resource skills at all levels. With few global investment opportunities and more IOCs entering, or re-entering, the LNG development business, NOCs have been able to pick and choose which IOC they wish to work with, although the selected company is often chosen as a result of established relationships. These relationships are based on “categories of complementarity”; is the IOC offering the NOC what it wants or is it trying to impose its view of what is required on the NOC? In Qatar, two IOCs walked away from the North Field in the early 1980s⁶, which displeased the Qataris and it has taken 30 years for one of them to regain a position in the country through a GTL project and the Qatargas IV project – though the commercial terms of the projects are, it is understood, more in favour of QP than the earlier investments in Qatar made by other IOCs. Qatar realised that it did not itself have the necessary technical expertise and would need an international partner in Qatar to bring this as well as access to markets and finance expertise.

Qatar believed that Mobil had excellent project development experience (based on its Indonesian track record) while appreciating that Mobil sought to diversify its investment portfolio, looking for a new large LNG investment opportunity as gas/LNG production from Arun (Indonesia) was declining. This complementarity formed the basis of a highly successful relationship between Qatar and Mobil (now ExxonMobil). ExxonMobil brought LNG knowledge and processes and moved staff between projects in Qatar to share the expertise within the Kingdom. As project development slows down in Qatar, ExxonMobil has moved to develop other projects globally, Papua New Guinea (PNG) and Gorgon (Australia) to name two. ExxonMobil may need to manage the perception, on the part of Qatar, that

⁴ EoN Ruhrgas Annual Report 2005, Section “Magazine”, page 30, http://www.eon-ruhrgas.com/cps/rde/xbcr/SID-AC6E8B48-002EAB9F/er-corporate/ER_GB_2005_gesamt_E.pdf

⁵ Natural gas going global – a realistic scenario or a chimera? Jochen Weise, E.ON Ruhrgas AG, IEF - IGU First Ministerial Gas Forum, Vienna, 24 November 2008.

⁶ Andy Flower, Natural Gas from the Middle East, in ed. Jonathan Stern, *Natural Gas in Asia*, OUP: 2008, p.343.

skills developed on the back of Qatari projects will be used to the benefit of a competing LNG producer.

The trend for LNG development is that in the case of the first project the NOC tends to accept the IOC's proposed structure, specifications and decisions. Once the NOC has some experience, the relationship changes. At this stage, some IOCs find the NOC more difficult to work with as the NOC tries to impose its authority and the next project inevitably involves a need to seek compromise with much discussion needed to achieve NOC 'buy-in'. NOCs may then seek a higher equity interest in the project as they have more skills and available funds (through dividends from earlier projects). At all times NOCs are very concerned about cost and the use of local content - their own labour, materials and local manufacturing and engineering companies. Also, the NOC has to ensure that any LNG project development is politically acceptable. Through this process, NOCs have gained LNG project development experience, and key individuals have developed negotiating experience applicable to taking their relationship with the IOC to the next level of evolution.

NOCs are also developing growing asset bases in their own countries – through increased national involvement and stiffer contract terms, and the higher oil and gas prices of 2007/8 gave them an increase in available funds to support this. At this time, relationships between the NOCs and the larger IOCs were increasingly strained - the IOCs are cash-rich, but they are opportunity-poor⁷. As NOCs gain confidence and internationalise, IOCs and NOCs are starting to compete on the world stage - competing in one project while being partners in another (this has been typical for IOCs but not for NOCs). As they internationalise, NOCs are also becoming increasingly sophisticated and this is further complicated as NOC gas companies (e.g. Gazprom) develop international oil resources as well as gas. Some NOCs such as Petronas have, some say, become a quasi IOC (see Figures 1 and 2).

It is not only the NOCs that have diluted the IOCs' influence in LNG developments and the LNG chain. In developing the SEGAS LNG project in Egypt (with 80% shareholding), Union Fenosa Gas has shown that a non-IOC can deliver a liquefaction project. ENI purchased a 50% share in Union Fenosa Gas⁸ during the project development, but it demonstrated to the IOCs and the NOCs that smaller companies could develop LNG schemes.

Q2 - What are the Key Skills that IOCs bring?

BP's Tony Hayward says IOCs bring "access to risk capital, technical expertise in areas like geochemistry, diverse asset portfolios, an ability to build relationships with customers worldwide through their refining and marketing activities and strong brands that transcend national boundaries"⁹. In discussions, the view of the interviewees was that the primary role that an

⁷ Ian Golop, PetroSantander, NOC Conference, December 2007

⁸ http://www.eni.it/en_IT/media/press-releases/2002/12/Eni__acquired_a_50__stake_in_U_05.12.2002.shtml?menu2=media-archive&menu3=press-releases

⁹ Guy Chazan, Algeria oil tie-up thrives, The Wall Street Journal, Page 36, 28th January 2008

IOC serves is the ability to provide project management skills. An NOC always has to answer to a politician and therefore will build this bias into the project development plan, while an IOC develops a project on a strictly commercial basis. In such circumstances, having achieved a suitable compromise, the NOC can, when challenged by government, 'blame' the IOC as the reason why the politically preferred outcome was not achieved. An area which has seen conflicts between NOCs and IOCs is where terms were initially agreed with an NOC and politicians at a time when risks were generally accepted as high (the investment risk may be the country itself). Subsequently, when the NOC has gained experience and the project is operational, the politicians view the 'point forward' level of risk as significantly lower and complain that the terms that were agreed are now not commensurate with the future (lower) level of risk.

An IOC also gives confidence to a project as it lends its reputation and brand to project delivery. That said, as NOCs grow in confidence and reputation, they could most probably develop an LNG project on their own (which Sonatrach is doing with the Gassi Touil and Skikda rebuild projects). In the case of Sakhalin LNG, capital costs rose from ~ \$12 billion. to ~ \$20 billion. and Shell, the major IOC in the project, was "blamed" for this cost overrun with potential impact on their LNG development reputation. This overrun, together with environmental issues, was also used as political leverage by Gazprom to secure a majority shareholding in the project.

IOCs also bring finance support although, when oil prices rose in the period 2003-2008, many NOCs were able to drive the financing of projects themselves. (QP however sought a \$1 billion shareholder loan from ExxonMobil, ConocoPhillips and Shell in each of the Qatargas II, III and IV projects). With lower oil prices in 2009, and the 2008/9 financial crisis putting pressure on NOC funds, NOCs may again want IOCs for finance support and credibility. For new projects in new countries (i.e. countries which are building LNG experience), IOCs can bring credibility and send a signal to the international energy and finance community and LNG buyers that an LNG supply country is opening up and that it is likely that an export project will materialise – e.g. Total in Yemen, ExxonMobil in PNG. The financial crisis is also leading to creativity in the financing of NOC equity. A good example is the way the PNG government secured its 19.4% equity share in PNG LNG through a \$1.1 billion convertible bond with the Abu Dhabi government-owned International Petroleum Investment Co. (IPIC) through a stake in Oil Search¹⁰.

IOCs also bring a global view on the business and best practice across all areas of the LNG business. In Qatar, QP wanted a proven operational system and used the ExxonMobil one, tailored for its own use. In one interview, it was observed that IOCs could bring a "Good Image" access to market, where countries such as Algeria and other LNG suppliers may not want to be the face to the market and prefer to use an IOC to carry out the intermediary role.

¹⁰ [http://www.thefreelibrary.com/Abu+Dhabi's+IPIC+Buys+\\$1.1+Bn+Into+Oil+Search+&+LNG+Venture.-a0190204124](http://www.thefreelibrary.com/Abu+Dhabi's+IPIC+Buys+$1.1+Bn+Into+Oil+Search+&+LNG+Venture.-a0190204124)

IOCs bring cost competitiveness and advanced technology, though in many cases they will look to the project company (and therefore the NOC) to pay for it, which can cause some commercial conflicts. In some parts of the chain, the research and development cutbacks implemented by IOCs in the 1980s and 1990s are still being felt, and this can put them at a disadvantage versus some other infrastructure providers.

IOCs, whether in their own name or through LNG joint-ventures, bring investment to countries through local content, for instance development of LNG trading, job creation and industrial development. (General Electric, for example, has constructed its regional turbine service centre next to the Atlantic LNG plant in Trinidad and Tobago bringing valuable experience and jobs to the country). These are practical investments, not just philanthropy, which develop capabilities in country. Also, an IOC carrying out this investment will do so applying international environmental standards, which many countries appreciate.

In the early stages of a country's LNG business the IOC often takes the role of bringing the market to the project. During the period 2002-2008, as the LNG business matured, and there was a relative shortfall of LNG supply, the market has come to the LNG seller. For example, the shareholders in the Gate project in Rotterdam are all utilities – Dong (Denmark), Eongas-OMV (Austria), EoN (Germany) and Essent (Netherlands trader-being purchased by RWE, Germany). All these end-users are seeking LNG in their own name and as noted earlier, EoN and RWE are seeking to move up the gas/LNG value chain to secure supply and involvement in LNG liquefaction projects. This gives the NOC more choice.

It is however the intellectual rigour, realism, performance culture, resources and political cover that IOCs bring to the NOC which underpin NOC/IOC relationships. There will always be a conflict in the relationship (a “love/hate” relationship) as IOCs and NOCs have different cultures as well as political and commercial drivers. If there are problems with the IOC, it is likely that they will be blamed (as they have the deepest pockets) and international reputation. Fundamentally NOCs and IOCs may successfully work together where the NOC is able to, in the first place, harness the IOC's ability to successfully execute a project; and subsequently to absorb this ‘IOC Corporate DNA’ (skills and culture) into the NOC's own organisation.

Q3 - Which companies have done well and which not so well?

A key point driving a company's success in the LNG business is the culture of the company itself. Some said that those companies that are pure oil companies have not done as well as those that are also gas focussed companies. Gas is a more collaborative business (due to the high infrastructure investment required, inter-linkages of investment in the chain and the dependence on gas as a fuel to meet countries' security of supply obligations) and the cultures of the gas companies are therefore more conducive to developing LNG projects. Shell has a good reputation “Shell would always have a full team on the ground, when another IOC had a few resources flying in from London”.

Clearly ExxonMobil has also done well through gaining Mobil's gas expertise when the companies merged in 1999. "ExxonMobil are still the best, hard in negotiation but the fairest" and ExxonMobil's centralised structure means that you get full political support for projects at all stages of a project. One observer said that other IOCs have not been as good as ExxonMobil. One IOC received limited management support and therefore tended not to focus sufficient resources on LNG compared with other companies.

In a competitive world where IOCs seek to secure partnerships with NOCs, it is vital to be seen to offer something that other IOCs have not got. BG has done this well; by securing Lake Charles capacity (a forward thinking strategy) it gave BG a leading position in the USA – a milestone in developing positions along the LNG chain ahead of other IOCs. BG was therefore able to offer clear market access leading to NOCs committing LNG volumes to BG at competitive prices (Equatorial Guinea and Egypt).

Big companies, however, often do not differentiate between engineering and business development resources – each have distinct skills and IOCs should ensure that the right resources are used for a specific purpose. IOCs have at times carried out project development activities using engineers which is not as effective an approach as using skilled project developers.

Q4 - How important is culture and individual contact vs. more commercial factors?

All those interviewed thought that success in LNG developments is all about personal relationships and that the soft issues are key. It was noted that even though the role of individuals is important, some are clearly better than others in managing relationships and it is the accumulated actions of a number of people that is important – trusting teamwork is vital. The development of such relationships does not come as a right; relationships require daily maintenance and investment. In a business that requires huge capital investments and partners to work together for more than 20 years, strong individual relationships are important, but trust across the whole organisation, especially at CEO level is vital. One IOC was never seemingly able to achieve this, as its focus was upstream oil-oriented, where long-term relationships are of less importance.

Another respondent said: "When Shell was developing the Oman LNG project, involvement of senior personnel was vital, as when the negotiations required clear high level direction (as all negotiations do) senior management would visit Oman, discuss any problems or issues at a high level, and set the negotiating teams in a new direction with the common aim of 'doing a deal' ". The ability of senior contacts to enable problems to be resolved at an early stage is very important.

The culture of a company is also a major element of how relationships between NOCs and IOCs develop. Governments and NOCs expect the individuals that they meet and negotiate with to have the full support of their senior management – "the negotiator must be perceived by the NOC to be the deal maker". Some companies do not do this well with negotiators

having to refer back to head office all the time. “Face to face contact is vital, e-mails and telephone calls are not enough”. Culture is different between companies. One interviewee stated that “ExxonMobil has a distinct culture and processes which are good for new project developments requiring a defined proven process” and “The culture in Shell is different”. The culture and approach required during different phases of project development may also vary and the IOC must react to this change with individuals staying in place to see a project through and into the operational phase.

Respect for local culture is also a very important part of developing a trusting relationship. Individuals in NOCs may know and understand the culture of the IOC, but individuals from the IOC need to appreciate and respect the culture of the NOC. NOCs tend to like IOCs (and individuals from that IOC) that respect culture (e.g. respect for Moslems during Ramadan), and this extends to the NOC/IOC interfaces when the IOC runs courses and sessions for newcomers to ensure that the local requirement for culture is passed to new arrivals. IOC involvement in social responsibility programmes is also respected by NOCs (e.g. Shell and ExxonMobil in Qatar and other countries). In a world where society has changed and respect for culture has fallen away, the IOCs that still respect local culture will be in a good position to develop business opportunities.

The issue of staff movement within the IOCs is also important. Whereas NOC resources tend to stay in the same job area (being promoted within the IOC or in government over time), IOCs “chop and change” individuals as part of their career, and relationships come under pressure as people change. One interviewee noted that a two year rotation policy simply did not enable relationships to be developed; moving staff around meant that they always “suffered from immaturity”. The issue of staff movement is not just important during development and implementation of a contract, but even before the discussions start, a company (and individuals) must be interested in the country, with a high level of in-country activity before any deal will be agreed to. Gazprom is putting considerable resources into Nigeria to encourage NNPC and the Nigerian government to work with it in the development of export and domestic projects. Chinese companies CNOOC, CNPC and Sinopec are doing the same in many countries. This is a pre-investment which some companies may find difficult to justify. The IOC must also gain a deep knowledge of the NOC concerned and have a strong sense of self awareness of that NOC before any deal can be done. Culture is different in each country; one cannot just take individuals who are excellent in one country and put them in another and assume that they will succeed; different individuals will be better suited to each environment.

In a brief discussion with a major IOC, the point was made that how the company manages NOCs is one of its critical success factors and therefore confidential.

Q5 - What will the role of the IOC be in the future?

There is no single role that can be defined as the “IOC role”. What an IOC can bring to a project will vary by project and country. Several interviewees noted that IOCs should think

through and ask: “What does a NOC want?”, and “What can the IOC offer that NOC?”; not, “What is in it for the IOC”? IOCs are more immature and NOCs are more mature than IOCs think!

See below for discussion on what IOCs bring to an NOC.

Q6 - Will NOCs operate without IOCs?

Some interviewees said that there is a trend towards NOCs and service providers working together without IOC involvement – “Kellogg Brown and Root (KBR) can build a plant, but not operate it”. Others clearly stated that they did not think that any NOC can at the moment develop an LNG project without an IOC. For the Skikda rebuild, the front end engineering and design (FEED) and the engineering, procurement and construction (EPC) were carried out by KBR, but for Gassi Touil KBR did the FEED and the EPC is being carried out by SNAM¹¹, with subcontracts to different companies, normally specified to have a certain level of local content. It was viewed that if a company wants to get the resources to carry out a contract then it will secure them from other companies. When CBI¹² and Hunt were looking for the skills to develop the Peru LNG project, CBI procured resources from KBR and Hunt recruited from the broader LNG industry. I believe that service companies do not want to develop LNG projects in their own name, preferring to act as contractors to project developers.

Sonatrach has stated that it will only sell LNG on a short-term basis and on an ex-ship basis thus giving it control over LNG sales. Its move into the UK (taking capacity in Isle of Grain) also shows how it has grown through the LNG chain.

The only NOC that could be close to developing an LNG project without an IOC is Petronas, but it is still viewed that it may be some time before Petronas will wish to proceed without an IOC partner to share risks and provide financing as well as commercial support. It will be interesting to watch how Petronas operates in Australia with Santos on their planned Gladstone LNG coal bed methane project¹³.

Do IOCs just want to become service providers? The answer is no, there would always have to be some linkage to other parts of the gas value chain. NOCs and governments will also decide which NOCs they want involved in projects, decisions often made for political reasons. Even though many companies sought to be involved in the Russian Shtokman project, the selection of StatoilHydro and Total has meant that other companies, with relevant experience, will not be involved. If offered involvement in a project, IOCs will compare potential LNG investments with other projects in their energy portfolio and pursue those that support the overall company level strategy. If LNG project economics do not meet a

¹¹ SNAM Rete Gas <http://www.snamretegas.it>

¹² CBI is Chicago Bridge and Iron Co <http://www.cbi.com>

¹³ <http://www.santos.com/activities-browser/development-projects/gladstone-lng.aspx>

company's screening criteria then the IOC may decide not to develop that project. IOCs will therefore have to decide, if only offered a reduced involvement in an LNG project, such as a service provider role, whether to take the revised role or not to be involved in a project at all.

A key question is: 'Do the NOCs have sufficient manpower and skills and "corporate DNA" to effectively manage the development of an LNG project, when you need individuals of 20-25 years practical LNG project development experience'? Some NOCs currently have a limited number of such resources (most NOCs have not been in the LNG business for that long), and one interviewee noted that it will take two more generations before NOCs will be suitably resourced to operate completely independent of IOCs. NOCs also like the geographic flexibility and sophistication of IOCs; it is appealing to them and a good way of training NOC resources both in-country and through cross-postings.

Some NOCs are concerned that IOCs develop their resources on their projects then send them to another country to develop other projects that are potentially in competition. (Nothing was mentioned however about experienced resources brought in by IOCs to develop the original LNG in-country projects!).

With increased resource nationalism, driven by politics not necessarily economics, a key question is: 'Will NOCs have to be seen to develop projects without IOC involvement?' We have over the past few years seen NOCs enter into technical cooperation agreements and alliances with state-owned energy companies (e.g. Sonatrach and Gazprom) to access reserves and markets. It is argued that NOCs are more comfortable working with fellow NOCs and state companies. Algerian Oil Minister Chakib Khelil stated: "You develop a camaraderie with one particular guy because you find you're very close to him in terms of culture" and "only Western Companies that take [this] approach can expect preferential treatment in Algeria"¹⁴. That said, even if NOCs partner together, they will still look after their own interests in negotiations. The issue is whether the state-owned energy companies bring sufficient skills, and the commercial and financial support that is required by the NOCs?

It will be interesting to watch which companies NOCs decide to work with in the future. Are government to government deals moving towards arrangements which see the LNG supply country NOC working directly with the gas buying country incumbent or utility, with no role for the IOC? Such a move would be a real threat to IOCs, as gas buying utilities can bring the necessary finance and market access that IOCs have brought in the past. Also, utilities are setting up LNG trading units (e.g. Centrica, RWE and EoN) to optimise returns (for the LNG supplier and themselves) in the event that gas demand in their countries can be met from alternative gas supplies at a lower cost. Utility companies such as GDFSuez, as end user gas buyers, seek to purchase LNG direct from LNG supply countries and NOCs, and do not need IOCs and intermediaries. Before 2000, sales of LNG tended to be direct to end user utilities; sales to IOCs as aggregators are a fairly recent phenomenon. End users would prefer direct

¹⁴ Algeria oil tie-up thrives, The Wall Street Journal "8th January 2008

contract with LNG suppliers rather than via an IOC, unless the IOC can add value – such as volume flexibility or variations of pricing terms.

Another area that has changed since 2007 is the movement by LNG shipping companies down the LNG value chain to use their surplus LNG shipping capacity as floating regasification terminals and storage facilities. Excelerate Energy (part of RWE) has gone one stage further and developed on-land jetties (such as in Kuwait) to which their vessels are attached during the regasification process.

LNG supply countries are also working together to optimise their costs. In April 2009, Malaysia LNG announced an LNG swap arrangement with Qalhat LNG (Oman) to “exchange technical information, exchange and train staff, and alternative LNG supply arrangements and cargo swap arrangements to increase value for both companies¹⁵. As part of this arrangement, Petronas gained access to exploration in Oman, thus broadening the company’s global upstream position. Such arrangements could grow as LNG suppliers seek LNG supply flexibility because their buyers have potential difficulties in taking LNG cargoes as a result of falling domestic gas demand due to the economic crisis.

Does an NOC need an IOC to underpin the financing of a project? With oil prices over \$100/bbl there were many who were of the view that the additional revenues would lead to greater availability of regional finance and a reduction in the role of an IOC in financing a project. Global economic developments during 2008/9 could curtail the ambitions of many NOCs. Those seeking to expand internationally will be re-evaluating their strategies as governments seek to use NOC funds for other domestic purposes. NOCs who seek to go downstream into gas markets may decide to let a third party (IOC or utility) continue to access the markets, particularly as demand falls away in the recession - thus passing the market risk to a more creditworthy party (though this could be a utility). An IOC still brings valuable funds and access to international debt finance.

Where an NOC decides that it wants to work with an IOC, how does it decide which IOC to work with? Traditionally, IOCs with the feedgas were selected as partners. Also, once in a particular joint-venture it is “easy to go with the flow”, with IOCs and NOCs using the same trusted relationships, making it difficult for new companies to gain a commercial role in any new LNG projects. In Brunei for example Shell has remained the preferred IOC since the first LNG project was developed in 1972. In Oman however, when the government sought to expand the LNG project (Qalhat LNG which started operations in December 2005), it sought a structure that would reduce the existing international company’s shareholding and introduce a new company (Union Fenosa Gas 7.36%) as well as increasing the government’s equity stake (74.59% in Qalhat LNG compared with 51% in the earlier Oman LNG). Also, in Qatar, Qatar Petroleum brought ConocoPhillips and Shell into Qatargas III & IV rather than remaining just with ExxonMobil (the 30% shareholder in the Qatargas II project). That said, once involved in an LNG project, the IOC will tend to stay in country and remain involved in

¹⁵ http://www.btimes.com.my/Current_News/BTIMES/articles/kdomana/Article/index_html

project expansions (albeit maybe with a lower equity share), unless the government seeks to diversify to include new companies.

At the other extreme, NOCs may move towards a bidding system for partners, rather than using relationships, as a means to secure optimal terms and to actively diversify the number of IOCs involved in country. When in 2008 Sonagas (Equatorial Guinea) was seeking international partners for an in-country gas gathering system to supply an expansion to the LNG project as well as the domestic market, it issued a tender and EoN and Union Fenosa Gas were selected as partners. In 2007, NNPC issued a tender (to 50 interested companies) for equity volume from the OK LNG project. (At the time of writing, the project had still not moved ahead). In both cases IOCs were not the automatically selected partners.

Post-2008, during a period of oil price uncertainty and volatility, NOCs may seek to again work with IOCs to spread the risk. Oil price volatility affects IOCs and NOCs differently as they have different investment profiles. When the oil price is high, NOCs have surplus funds and seek to invest, while IOCs prefer to invest when oil prices are low and the relative cost of such investment is low. NOCs also like to work with IOCs in a managed way.

IOCs seek to access reserves for the development of projects, but also as companies they want to credit reserves in their annual accounts to improve their credit rating and support their share price. As NOCs control access to or own the reserves and development of the country's gas, it means that NOCs effectively "control" IOCs' investment opportunities. For example, the Qatar gas development moratorium is slowing down new gas opportunities in the Kingdom – the government is deciding what should be developed. Producers therefore seek to look after the interests of their own country rather than any particular IOC's balance sheet. The Egyptian government has a specific gas reserve depletion policy, which has been outlined by Minister of Petroleum in a series of speeches. One third of reserves are to be monetized through export projects, one third of reserves are to be consumed in the domestic gas market and the remaining third is to be set aside for future generations¹⁶.

Q7 - Does the focus by NOCs on the domestic market reduce the role of IOCs?

A focus by NOCs on the domestic market will tend to reduce the need for IOCs as there is reduced complementarity. Companies (other than IOCs) can build power, methanol and other infrastructure and with lower technical barriers (local companies can develop such infrastructure with international service and equipment suppliers). That said, when QP decided not to move forward with the Gas to Liquids project with ExxonMobil, QP gave ExxonMobil a 10% stake in the Barzan domestic gas project which should be operational by 2012 and boost domestic gas supply¹⁷.

¹⁶ <http://www.eamgcc.org/archive/docs/File/downloads/Egypt%20Diagnostic%2029%20dec%2006.pdf>. Page8

¹⁷ Andy Flower, Natural Gas in Asia, Chapter 8, Page 351, June 2008

Recent political pressures by resource countries to develop domestic gas as a priority or in parallel to export projects, means that IOCs may have to get involved in domestic gas investments as a means to secure gas for export and investment in export projects. In Egypt, Indonesia and Nigeria and even Western Australia¹⁸ have set clear rules that state that a certain percentage of new gas must but made available to the domestic market. In Nigeria this goes further, where companies who fail to comply with the domestic gas requirement will have to pay compensation¹⁹. This policy may favour Utility companies who have downstream investments in their home market and bring the necessary skills to an NOC.

SECTION C

Discussion

In this section we reflect on the findings of the interviews and build a framework which facilitates an understanding of the needs and contributions of NOCs and IOCs to the LNG business and future development of projects.

Strategic Objectives of NOCs and IOCs

The role of NOCs has changed as the host governments have sought to develop NOCs from being an investor in country (and maybe the manager of the country's resources) to a broader commercial organisation, in many cases moving overseas. This move was in response to increased global growth of demand for gas, governments seeking greater control over their resources and seeking to gain additional rent both in-country and also further down the LNG value chain. Also, NOCs may seek to secure additional energy resources for their own domestic use. IOCs in response have had to change their offering from "leading" to "jointly developing" and in some cases may have to accept lower project returns²⁰ or less equity in order to secure a place in a project.

The objectives of NOCs and IOCs vary considerably. An NOC answers to a government, which is driven by political and country objectives. An IOC is owned by its shareholders and seeks a commercial return for the investors, targeting investments in large scale ventures, focusing on a few key countries through high technology and capital-intensive investments such as LNG and GTL. Within each of these organisations, individuals and departments have different roles which can be in conflict. Individuals are also moved around within the organisation, taking different roles and often working in joint ventures where they negotiate with their colleagues, doing so for the benefit of the organisation they are currently attached to. This "split personality" structure is normal to the IOCs, but is just coming to NOCs. When Malaysia LNG Dua was agreeing the terms on which gas was to be purchased from the

¹⁸ David Ledesma, *Natural Gas in Asia*, Chapter 8, Page 308, June 2008

¹⁹ Nina Bowyer, *Herbert Smith Energy Exchange*, Page 6, Winter 2008

²⁰ IOCs usually use Net Present Value discounted at a specific percentage rate and/or internal rate of return (IRR) as key project return indicators. IOCs would evaluate projects on the basis of ungeared (non-leveraged) economics.

Carigali/Sarawak Shell joint-venture, the negotiating teams on both sides included representatives from Petronas and Shell. Only Mitsubishi was on one side of the table as a shareholder in the LNG plant but not the upstream. These conflicts have to be managed by both the NOC and the IOC.

In most cases, the NOC has a clearly defined role to manage the country's gas resources. In so doing they seek to fulfil the priorities of the government; develop, produce and monetise gas reserves while sustaining economic development and aligning the political, commercial and strategic interests of the government and the NOC. Some of the commercial challenges facing the NOC can be in conflict. For example, while seeking to maximise the government /NOC shareholding in a project, the NOC may not be able to afford its equity contribution or attract the necessary finance. It may therefore need to accept a lower shareholding. (Some IOCs have offered NOCs a carried interest²¹, but mainly such financing has been through shareholder loans because IOCs want NOCs to inject their own funds as equity to show project commitment and as part of the third party financing). However, new entrants who are keen to secure LNG supplies may be willing to offer NOCs a carried interest. Also an NOC as an LNG plant shareholder may seek low cost gas, but an NOC as an upstream developer or government shareholder would want higher revenues (e.g. the MLNG Dua example discussed above).

A key political driver in many cases is for the government to use LNG investments as a means to transfer knowledge into the country and stimulate economic development - jobs, jobs and more jobs at the right level. IOCs argue that they provide advanced technology to NOCs but NOCs argue that they have also developed world-leading technology (e.g. Petrobras, ultra-deepwater exploration, Sonatrach, onshore oil and gas exploration capabilities) and improve on technology provided to them by industry partners (e.g. QP took big bore-well technology and improved it to reduce costs by over 50%).

As noted earlier, an IOC is driven by shareholder value, seeks growth opportunities for the company and profit maximisation through a clear strategy and coherent actions. IOCs will only go ahead with an opportunity if the project meets their economic criteria while NOCs may have other factors driving their decision making. That said, IOC commitment to a project starts very early on in the project development process, and exiting a project near the investment decision date may be damaging for the reputation of the IOC in that country. IOCs also seek access to reserves that can be booked in their accounts, high value markets and available finance and optimised costs and competitiveness through portfolio diversification, to share risk and diversify its asset portfolio. NOCs, as well as managing energy resources on behalf of their governments, seek to develop their countries economically and through the construction of infrastructure and movement into different parts of the LNG value chain, thus creating additional export earnings (see Table1).

²¹ Carried interest is where one party funds the equity investment of another.

It is the ability of an IOC to apply technology, take risk, implement and project manage the development of a highly capital intensive LNG chain investment, that is the key consideration of an NOC as to whether to work with an IOC. Successful projects, such as the Qatari projects, Malaysia and Egypt, were developed with few equity partners. These projects were normally developed faster than projects with a larger number of shareholders (e.g. North West Shelf, Angola, Oman LNG) where IOC egos and company agendas may often get in the way of fast project development. Woodside is developing the Pluto LNG project without an IOC and is only bringing Japanese buyers Kansai and Tokyo Electric in as 5% equity holders (each) because they are buying LNG and also to support the financing through providing access to Japanese funding. I believe that Venezuela has decided to select equity partners for its LNG project on the basis of political direction and influence rather than which company can provide the best skills to develop the project²². The resulting shareholder mix, lack of LNG experience in-government, political commitment and financial status of Venezuela means that the likelihood of a fast project development is reduced.

A third person in the LNG chain is the LNG buyer who is looking for timely LNG supply that is cost competitive with other fuels and other LNG supply. The LNG buyer is willing to develop regasification and downstream gas distribution facilities (at considerable investment) in return for a regular supply of gas. Security of supply is often high on the agenda of the LNG buyer, which it secures through long-term purchase contracts, diversifying LNG supply from several countries but importantly by gaining a responsive positive relationship with the LNG supplier, often at a government to government level.

The strategic objectives of NOCs and IOCs therefore vary, but it is the ability of the two sets of organisations to recognise each other's aims and work together effectively that result in successful projects. Table1 sets out the differing objectives of NOCs and IOCs.

²² The Venezuelan government has announced that the LNG plant partnership structure for its project is: TRAIN 1 – PDVSA (Venezuela): 60%; Galp (Petróleos e Gás de Portugal): 15%; Chevron: 10%; QP (Qatar Petroleum): 10%; MIMI (Mitsubishi & Mitsui Japan): 5%. TRAIN 2 - PDVSA: 60%; Galp: 15%; ENARSA (Argentina): 10%; Itochu (Japan): 10%; MIMI: 5%. TRAIN 3 - PDVSA: 60%; Gazprom (Russia): 15%; ENI (Italy): 10%; Petronas (Malaysia): 10%; EDP (Energias de Portugal): 5%

Table 1: NOC and IOC Strategy Drivers

IOCs Seek:	NOCs Seek:
<ul style="list-style-type: none"> • Access to reserves • Access to governments • Access to closed in-country markets that are only open to NOCs • Secure investment subsidies and tax incentives (i.e. a stable and attractive investment, fiscal & legal framework) • Economically competitive projects and economies of scale • Avoiding resource nationalism • Risk sharing • Asset diversification • Maximum shareholder value 	<ul style="list-style-type: none"> • Access to downstream markets • Access to technology • Access to skilled personnel • Access to capital and international subsidies • Improved efficiency • Quality investment in their country • Knowledge transfer, employment • Economic development in-country • Meeting and fulfilling government priorities • Sharing risk and reducing the risk level to one acceptable to the government

Source: Author

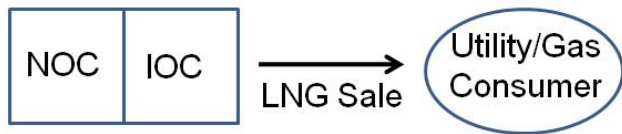
The number of NOCs has grown over the past 20 years to over 35 state companies with overseas assets²³, though not all are involved in the LNG business. We have yet to see a major M&A activity involving an NOC acquiring a large IOC. When CNOOC sought to purchase UNOCAL, the US government stepped in to ensure such a transaction did not take place on national interest grounds. The current economic environment could lead to an increase in M&A activity and the question is what role will NOCs have in such activity (if at all) and whether the governments of the acquired companies will accept an NOC purchasing a majority share.

IOC involvement in LNG projects is also being challenged by utilities who are seeking to secure gas for their markets. As noted earlier, NOCs like dealing with companies of a similar culture. Utilities, having developed as government monopolies can use this background to their advantage. Figure 3 shows how the structure has changed with the gas utilities/buyers moving upstream, matching the NOCs wish to move into the markets. The trend is for direct access between producers and gas buyers. Companies such as Gazprom seek to sell LNG to end users not through intermediaries or utilities. Utilities such as GDF Suez and RWE are able to purchase LNG direct from producers and do not need intermediaries. Is there enough room for an IOC in this arrangement? Will gas buyers be willing to accept lower returns in order to secure gas supply? Will utilities, new to the LNG business and therefore potentially more conservative in their commercial approach than the existing LNG players, be willing to invest only in lower risk projects, leaving the IOCs the high risk (and therefore return) projects? It is in this territory that IOCs will have to compete as they may not be able to offer sufficient incentives to NOCs in lower risk projects.

²³ Alex Forbes, European Energy Review, "NOC's spread their wings", page 54, November/December 2007.

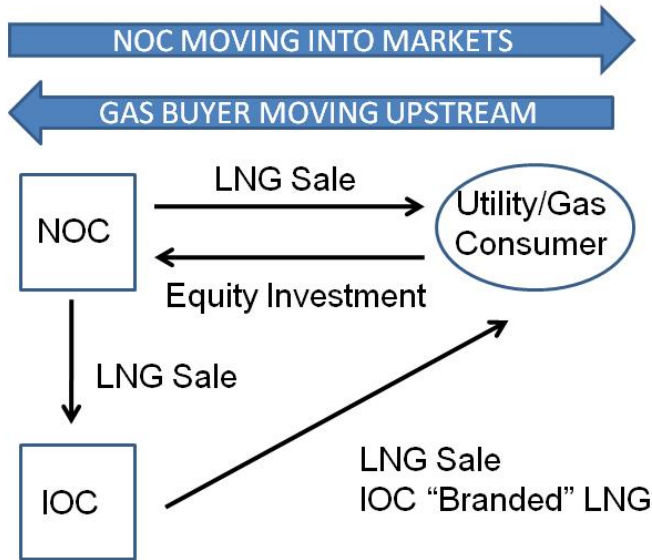
Figure 3: Evolving LNG Structure with Greater Gas Buyer involvement

Established LNG Structure



- NOC/IOC JV sells to Gas Buyer

Changing Structure with Utility Involvement



- NOC and Gas Buyer both seeking to move down/up the chain
- NOC sells direct to Gas Buyer
- Gas buyer invests in seller facilities
- IOC buys LNG from NOC and sells to gas buyers
- IOC still seeks investment in upstream and LNG chain

Source: Author

Two examples of utilities moving into the LNG value chain:

Union Fenosa

Union Fenosa’s acquisition of Edison’s 80% interest in the Segas LNG project²⁴ surprised many industry observers and competitors who were of the view that the company did not have the necessary skills or financial strength to pull the project together. Union Fenosa secured this position through considerable political lobbying and as the third largest power producer in Spain; it brought an end-use market to the project. ENI took a 50% interest in the Union Fenosa shareholder (Union Fenosa Gas-UFG) in the middle of the project development; it is understood to provide the necessary financial support. The project was developed successfully (with a few delays) despite the opinions of the several IOCs. On the back of this deal, UFG has secured a 7.36% equity interest in Qalhat LNG²⁵ (the expansion of Oman LNG) and developed a successful LNG trading organisation. The other LNG project in

²⁴ http://www.eni.it/en_IT/media/press-releases/2002/12/Eni__acquired_a_50__stake_in_U_05.12.2002.shtml?menu2=media-archive&menu3=press-releases

²⁵ <http://www.qalhatlng.com>

Egypt (ELNG)²⁶ had a more traditional shareholder structure (BG 35.5%, Petronas 35.5%, EGAS 12%, EGPC 12.0%, GdF 5%).

RWE

Since 1974 the German utility RWE has been exploring for oil and latterly looking to secure diversified gas supply. RWE, through its subsidiary RWE Dua, has secured upstream exploration blocks in Norway, Poland and North Africa. In Egypt it has found gas and is seeking to secure a position in an LNG project expansion. In February 2008 RWE purchased 50% of Excelerate, a company with LNG vessels with onboard regasification facilities, and is using these vessels to develop LNG trading. In February 2009 RWE acquired Essent, the Dutch energy trader, and through that acquisition has secured capacity in the Gate LNG terminal in Rotterdam²⁷.

I believe that RWE's strategy has been one of investing throughout the LNG chain to secure gas through LNG.

Thus both Union Fenosa and RWE have taken the role that IOCs would traditionally have taken.

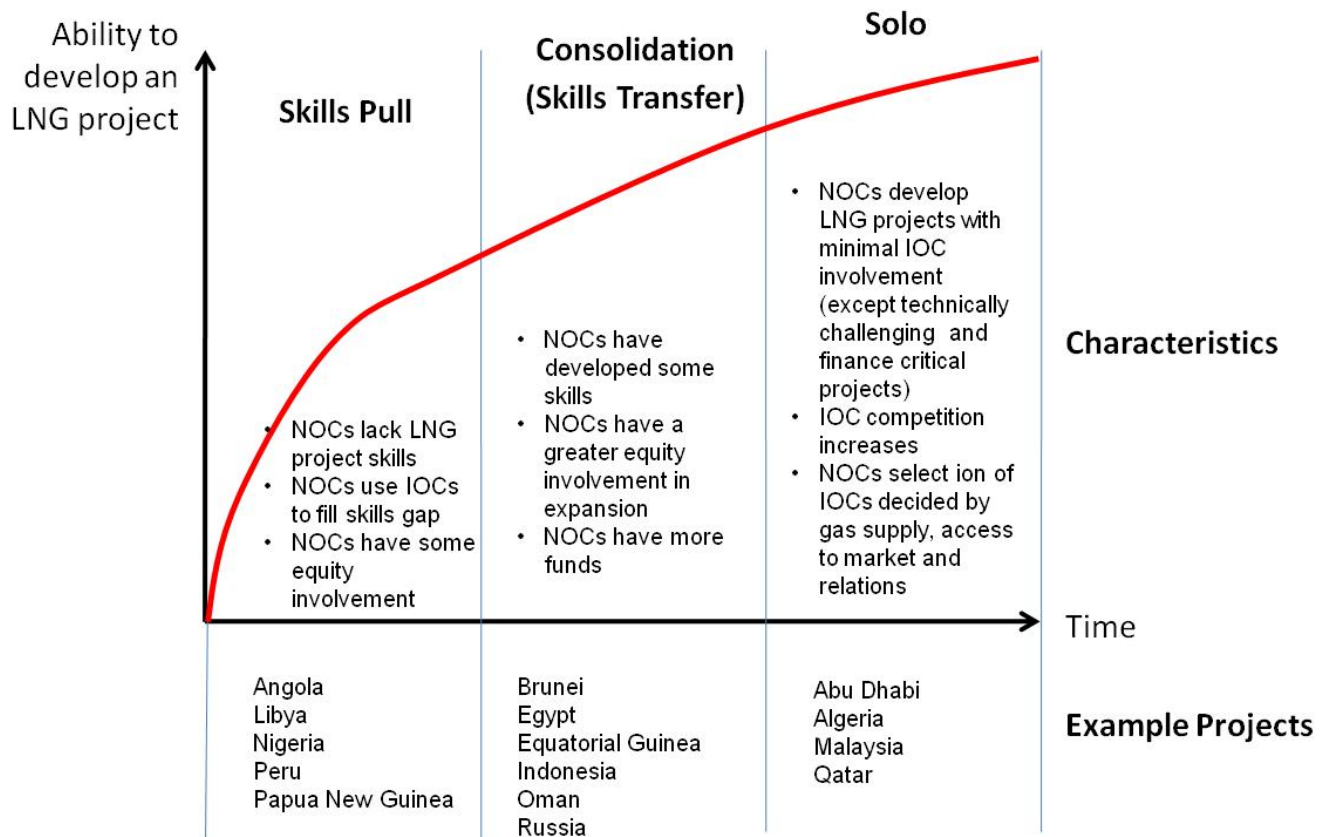
Stages in NOC Development

NOCs who are involved in LNG have different levels of knowledge, experience and capabilities to develop projects. These "Stages" of development are summarised in Figure 4 and Appendix 1 with LNG projects detailed by stage. Movement from one stage to the other depends on a variety of factors – political development in-country, level of government support (from all government departments), the IOC involved in the country and relationships between the NOC and the IOC and the level of risk that the NOC is willing to take. It is understood that in Oman it was the lobbying of one ministry (not the Ministry of Petroleum) that led to a different shareholding structure for Qalhat LNG, rather than just expanding Oman LNG with the same shareholding. In Qatar, despite heavy lobbying by ExxonMobil, the government decided to bring ConocoPhillips into Qatargas III and Shell into Qatargas IV. One can be confident that the Qataris were able to secure better shareholder terms each time they brought a new company into the country.

²⁶ <http://www.egyptianlng.com>

²⁷ <http://www.RWE.com>

Figure 4: Stages of NOC Development



Source: Author – see attachment 1 for a more detailed description

The earliest stage is one where an NOC is developing its first LNG project, the “Skills Pull” stage, where the NOC or national government has very little LNG experience and needs to rely on IOCs. The government will usually hire experienced consultants as a check to make sure that its position is being protected. Once the first project has been developed, and the national government has the skills, or has established an NOC with some skills, the country will be in a “Consolidation” stage, with IOCs being used to compliment those skills that the NOC lacks. In this stage the NOC will have a greater involvement and often force greater local involvement. The final “Solo” stage is where an NOC could in theory develop an LNG project expansion on its own. One could argue that the “end state” of an NOC is not being an NOC, but becoming an International NOC (“INOC”), driven by commercial rigour, and performance rather than just political considerations. Statoil has made this move, and is now a commercial organisation using its skills to invest in international projects throughout the value chain.

The issue of NOCs and risk is interesting. Politicians prefer low risk decisions, as the consequences of a perceived wrong decision can be drastic for the individual concerned. For

that reason, politicians have been happy to pass such decisions to IOCs that can bear the brunt of any blame. To become a complete INOC the government will have to accept that it, together with the NOC, must transcend this culture and take investment risk rather than offsetting it with an IOC.

QP is a forward thinking NOC. It has invested along the LNG value chain, initially as a means to get costs down so their LNG could be competitive in the flexible markets of the Atlantic Basin (where LNG is a price taker). These positions will enable it to optimise its LNG portfolio and the market has already seen LNG that was originally destined for USA and UK (the markets on which the revenue stream for project financing was based), being sold into the Asian firm markets at nearly oil parity price levels²⁸. This move certainly shows that QP is a very mature LNG operator and other countries will aspire to follow its lead in managing relationships with IOCs and other companies.

At each stage of NOC development buyers and sellers still seek long-term contracts as a means to underpin LNG development. This trend is likely to be maintained for new projects.

Table 2 sets out the level of involvement of NOCs in the value chain and it can be seen that the longer an NOC has been in the business the more involved it is in a project. It is also interesting to note that some of the new entrants to the LNG business (e.g. Gazprom and Sonangol) have sought to take positions outside source-country and invest in LNG regasification capacity as part of the development of a gas export project.

Some NOCs are starting to take positions as marketers in the gas consuming countries. The nearest is QP which is, through ExxonMobil Marketing Europe, marketing Qatargas II gas in the UK, but it is believed that it is ExxonMobil which is doing the marketing. Gazprom likewise is starting to market gas to end users. A reason for NOCs avoiding this part of the chain is that it has a relatively low margin.

²⁸ Oil price parity levels means that gas and oil prices increase and decrease at the same rate in energy heating value terms.

Table 2: NOC Involvement in the LNG Value Chain

	Year of First LNG production	National Energy/Gas Company	Stage of NOC Development	Involvement in Upstream	Equity in LNG Plant	Technical plant development/ construction knowledge	Ability to develop LNG project without IOC support	Ownership of LNG shipping capacity (note 1)	Access to LNG regasification terminal capacity (Note 2)
Current LNG Producers									
Algeria	1964	Sonatrach	Solo						
Libya	1970	Libyan Government	Skills Pull						
Brunei	1972	Brunei Govt	Consolidation						
Indonesia	1977	Pertamina	Consolidation						
Abu Dhabi	1977	Adgas	Solo						
Malaysia	1983	Petronas	Solo						
Qatar	1997	Qatar Petroleum	Solo						
Nigeria	1999	NNPC	Skills Pull						
Trinidad	1999	NGC	Skills Pull						
Oman	2000	Oman Govt	Consolidation						
Egypt	2005	EGAS	Consolidation						
E. Guinea	2007	Sonagas	Skills Pull						
Projects under construction									
Russia	Exp. 2009	Gazprom	Consolidation						
Peru	Exp. 2010	Peru Government	Skills Pull						
Angola	Exp. 2011	Sonangol	Skills Pull						

Upstream

Note: Does not include LNG producers Australia, Norway and USA who have no national energy company

High	
Medium	
Low	
None	

Note 1: One vessel = low, two-three ships = medium, majority volume moves on owned vessels = high

Note 2: One terminal = low, two-three terminals = Medium, All sales volume = High

What can IOCs bring to an NOC?

Box 1: What IOCs can bring includes the following (in no particular order):

Project and Process Management Skills and providing LNG chain project overview	This is an area that many in the industry believe is key to an IOC offering. The ability to provide project management skills during the development phase and operational support after the plant starts up is important. This expertise is strengthened by an IOC bringing experienced resources to a project, not only looking at the project as a series of discreet elements (upstream, liquefaction, shipping and regasification), but also as an LNG chain as a whole, to ensure that it operates seamlessly.
Risk Sharing and Understanding and Taking Political Risk	Investments in LNG projects require such large capital amounts that NOCs seek an international partner who will accept and can take project development and political risk. (It was noted that service providers may not wish to take such risk). With increased costs this requirement increases.
Access to Market	An IOC bringing access to market may not be a key factor to an NOC, but some NOCs still need IOCs to access Henry Hub and NBP deals. If there is profit sharing on cargo diversions, then selling through an IOC may be acceptable to an NOC.
Access to alternative LNG supply	IOCs with a broad LNG supply portfolio may bring alternative LNG supply in case of LNG feed gas supply difficulties in-country
Human Resource Support	The requirement for skilled human resources is a critical success factor to the development of an LNG project. The ability of IOCs to provide experienced personnel (for project development and operations) is a major advantage – but it must be accepted by the IOCs that the NOCs’ medium/long term intention is to increase the use of local resources (Qatarism, Omanisation, Malaysianisation etc) ²⁹ . In order to get the necessary skilled resources at all levels it will take several generations and even though, some argue, IOC involvement does reduce the available positions for locals; NOCs will call upon IOC resources to fill skills gaps and use them when they want; at the “beck and call” of the NOCs.
Finance	IOCs have traditionally provided financial credibility to projects, particularly where this has been through non-recourse project finance, and in some cases (e.g. Qatargas II,

²⁹ Qatarism, Omanisation, Malaysianisation are policies in Qatar, Oman and Malaysia respectively to encourage the use of domestic human resources and replace expatriates over a defined time.

	<p>III & IV) provided shareholder loans. With the rise in oil price to over \$100/bbl, NOC financing pressure reduced and the need for finance fell. Indeed, where finance was an issue, NOCs were able to negotiate good terms with IOCs. Where NOCs have lent funds to projects, these have been structured as shareholder loans ranking second to third party financing³⁰. IOCs are still reluctant to accept disproportionate financing structures, or paying an NOC's equity share. With lower oil prices in 2009 and the tight finance market post Lehmann's collapse in September 2008, finance may again be a huge "plus" that an IOC is able to bring to an NOC.</p>
Technology	<p>IOCs such as ConocoPhillips, Shell and more latterly ExxonMobil have used technology as a means to gain entry to an LNG project. Particularly, where LNG projects have scale, and complexity they offer IOCs better opportunities to gain a position and to differentiate between each other. ExxonMobil's ability to bring scale to Qatargas II (with the same concept being used in Qatargas III & IV albeit with other IOC partners) was a competitive differentiator which assisted in it gaining its position.</p> <p>Technology is important where the upstream or other parts of the chain are more complex. For example, the Indonesian government has charged Pertamina to develop the Natuna field, a technically complex project with 60%+ CO₂ but it does not have the necessary expertise. Planned projects in Russia - Shtokman LNG and Sakhalin III - will also require more complex technology which will give openings to IOCs who can add technology value.</p> <p>IOCs also offer to integrate at every opportunity, blending E&P, gas and power, downstream and chemicals business to develop a more appealing commercial deal³¹. They also seek to demonstrate high levels of operational excellence in cost-focused environments, which appeals to NOCs.</p>
Support to development of the local market	<p>Governments are making it part of policy that companies which want to invest in gas export projects will, as part of their projects, have to participate in domestic gas and/or power projects. IOCs will have to meet these requirements, either in their own name or in joint ventures. If they do not do this, then other companies such as utilities may take their place.</p>

³⁰ Third part financing is where a project raises funds from a consortium of banks. In the case of the project not being able to pay for the loans, debt provided to the project by shareholders will usually be paid off after the third party debt has been paid.

³¹ The National Oil Company, Accenture Executive Summary, April 2006.

What should an IOC do?

The purpose of this section is to give some thoughts about areas on which IOCs should focus to help build their relationships with NOCs.

a) Human Relations

Relationships are key – IOCs should develop a “Relationships Plan” with a coordinator managing the overall NOC relationships for all levels – particularly with different government departments. IOCs must be willing to focus resources on this effort on a long-term basis, and not move individuals to different projects. This means that individuals in IOCs will not have a conventional career track and will need new contracts.

IOCs will have to develop long-term relationships with countries with future project development in mind. Venezuela is a country with a political system that has a proven track record of nationalisation and is therefore currently not attractive for an IOC to invest in. That said, with proven gas reserves of 182 tcf³² it is one of the top ten gas resource holder globally. Iran is another country, with proven reserves of 982 tcf³³, where for internal and external political reasons, LNG export projects have not been developed. Can an IOC ignore the limited numbers of such countries as potential places to invest? IOCs have to maintain a presence and invest time and efforts in case investment opportunities do arise. Nigeria LNG took over thirty years to develop, but companies realised that the country had large reserves of gas and through having a long-term viewpoint the international shareholders of Nigeria LNG (Shell: 25.6%; Total: 15%) were successfully able to develop a commercial project which has subsequently been expanded.

Teamwork – Those projects that work well are ones where the individuals involved have been part of a high quality trusting team. IOCs must create such teams, invest time developing them and not move people from the team mid development. Team structures must be developed carefully with the correct skills. NOC-facing individuals must be chosen not by their position in the company but by the type of individual required for the position and who will optimise relations with the NOC. IOCs must not be frightened to remove individuals if they do not have the correct chemistry with the NOC or government. Individuals must be carefully matched with government and IOC representatives at all levels to ensure that the correct relationships are being developed.

Delegated Authority – NOCs prefer to deal with individuals who have clear delegated authority to make decisions. The IOC must create structures where such authority can be delegated and at the correct time (when requested by the negotiating team) senior representatives can be brought into the negotiations. A senior manager or managers not

³² BP Statistical Review of World Energy, June 2008

³³ BP Statistical Review of World Energy, June 2008

known or trusted by the IOC, getting involved in an unplanned manner can disrupt and potentially harm negotiations.

b) Strategy

IOCs should critically ask themselves what each NOC wants that the IOC can offer and how the IOC can differentiate itself from competing companies. How can an IOC prevent the natural mistrust between an NOC and an IOC?

NOCs and IOCs have different economic aspirations. IOCs should consider what rate of return is reasonable and agree structures that will prevent windfall gains (e.g. in case of high oil prices). This is easier for a company already in-country wanting involvement in an expansion project, which can revisit the terms of the original project as a tool to getting investment in an expansion or another project. Sometimes such companies may be wary of doing this in case they give too much away. The cost of not entering into such discussions may be reduced (or no) involvement in future investments in that country.

c) Global Openings

NOCs like to deal with companies which bring global skills, experience and alternative sources of LNG. IOCs can also offer NOCs international investment opportunities.

d) New Technology

As more marginal gas fields need to be developed - either smaller sized gas fields or technologically challenging gas fields such as Shtokman (Russia) and Natuna (Indonesia) - so the NOC will select partners who can bring the necessary technology to the project. StatoilHydro was selected by Gazprom for Shtokman due to its arctic experiences gained in the upstream development of Snohvit³⁴. For Natuna, Pertamina has been in discussions with ExxonMobil for several years about its position in the project and, as part of a renegotiation process, has approached other companies about taking over/joining ExxonMobil in the development of the project. Press reports state that, in addition to ExxonMobil, Pertamina and BP Migas (Indonesian regulator) are considering Shell (working with an Asian consortium), StatoilHydro, BP, Petronas and PetroChina³⁵ plus other regional companies. Each company would bring a particular skill to the project.

A key driver to IOC partner selection is the involvement of the government of the IOC involved. When Gazprom was selecting partners for the Shtokman project, the Norwegian and French governments were actively involved with the Russians, and all played a key role in partner selection, promoting specific companies through political relationships.

³⁴ Snohvit is the Norwegian LNG project that started production in 2007 with shareholders Statoil (Norway): 33.53%; Norway State DFI: 30%; Total (France): 18.4%; GdFSuez (France): 12.0%; Amerada Hess (USA): 3.26%; RWE-Dea (Germany): 2.81%

³⁵ World Gas Intelligence, Page 1, 5th November 2008

e) Domestic Investment as part of developing as LNG export project

As NOCs seek investment in domestic infrastructure as a pre-requisite for involvement in gas export projects, IOCs must ensure that they have the necessary domestic market experience to make their value proposition of interest to an NOC. The IOC is competing with utilities that have considerable interest in, and knowledge of, developing a domestic gas (and/or power) markets and NOCs may find this experience attractive. As noted earlier, it is giving the NOC what it wants, not what the IOC wants to give, that is important. IOCs could team up with utilities and jointly develop projects in NOC countries. This move would require IOCs accepting that utilities bring something to the project that the IOC cannot bring and that an NOC would see such a partnership as a benefit to the project. Alternatively an NOC may “force” the IOC to include a utility into the LNG project shareholding and as an LNG offtaker. This may not be in the IOC’s interest as it could be seeking to take ownership of some of the LNG exports to optimise their returns. An NOC may like this option as it lessens the dominance of an IOC and would prevent the possibility of an IOC seeking to impose its views on an NOC.

Future Worlds

The key factors that could determine the relationship between NOCs and IOCs are gas price and gas demand as well as the political will in country towards resource nationalism. Figure 5 sets out four different “worlds” in the balance of power.

Figure 5: - Future Worlds – The Balance of NOC/IOC Power Resource Nationalism vs. Gas Price and Gas Demand

Resource Nationalism	High	<ul style="list-style-type: none"> • Potential conflict • Deals may not be concluded • Access to new players who have finance 	<ul style="list-style-type: none"> • NOC has increased power • NOC dictates terms to IOCs • Access to new players
	Low	<ul style="list-style-type: none"> • IOC influence is higher • Access to IOC finance important • Large companies succeed 	<ul style="list-style-type: none"> • NOC has power but may not use it • NOC wishes to invest outside country • Access to new players
		Low	High
		Gas Price & Demand	

In a world where the gas price and demand are high and a country has a high level of resource nationalism, then the NOC, with money and political support, will be in a strong position to negotiate terms with an IOC. If the terms are not acceptable then the NOC will either deal with another company or not proceed with a project. In this world there is an opportunity for new entrants who may be willing to accept more flexible terms (i.e. lower

returns as the new entrant looks at the project from a different direction such as securing gas supply to meet its domestic market obligations) than an established IOC. Likewise at lower gas prices (i.e. below \$4/MMBtu) and with falling gas demand as a result of the economic recession (and sellers could potentially have surplus LNG), then the IOC will be in a stronger position as it brings both a market for LNG and finance to a project. The power of the IOC will be less in a country with high resource nationalism, but in such countries, projects may not be developed when gas prices are low (i.e. below \$4/MMBtu), unless NOCs and IOCs can agree terms which may be difficult because they will require some compromises by the parties which an NOC may find politically difficult to accept.

The “power” of NOCs and IOCs will therefore change depending on the economic cycle and political situation in country and IOCs should pay close attention to their position as they seek to establish projects.

Final Words

The IOC/NOC relationship has definitely changed over the past thirty years, as the level of market competition and number of players has increased. As new players seek to gain a position in the LNG industry, they will change behaviour in the industry and offer NOCs access to parts of the chain that IOCs have been unwilling to provide. IOCs must continue to evolve in response to these approaches as NOCs seek new partners and new companies, such as utilities who are keen to gain direct access to LNG supplies to meet their supply and commercial requirements, and LNG shipping and service companies seek to diversify into different part of the value chain. The pace of divergence in IOC/NOC relationships can be slowed down, but IOCs will have to clearly focus their strategy and activities, and be more flexible to NOC requirements, if they want to maintain their position in the industry. The financial crisis of 2008/9, and the shortage of available large gas fields on which to base LNG projects, will drive IOCs to more technically and politically challenging projects, where IOC finance will be required as lenders become more conservative post the 2008/9 financial crisis.

The LNG business has changed a lot since the 1960s and it is likely to change even more in the future. Because the world has moved on it is unlikely that the IOC dominance of the 1980s and 1990s will return. Companies must however behave a flexible approach to ensure that they will have a successful part in this growth industry.

Appendix 1

Box 2: “Stages” in NOC Development

Stage	Characteristics	LNG Projects
Skills Pull	<ul style="list-style-type: none"> ▪ NOCs lack LNG project development and technology skills. ▪ NOCs use IOCs and contractors to fill the skills gap. ▪ NOCs seek trusting relationships with IOCs to support LNG project development. ▪ IOCs gain involvement in projects through upstream involvement in feedgas supply and relationships with government/NOC. 	Angola* Libya** Peru* Papua New Guinea**
Consolidation (Skills Transfer)	<ul style="list-style-type: none"> ▪ NOCs have developed some skills through transfer of knowledge from IOCs and contractors. ▪ NOCs have a greater equity and management involvement in expansion and new LNG projects. ▪ NOCs use revenues from earlier projects for funding. ▪ NOCs select IOCs partly through who is involved in gas supply, access to market and relations. 	Abu Dhabi Brunei Egypt Equatorial Guinea Indonesia Oman Qatar Russia
Solo	<ul style="list-style-type: none"> ▪ NOCs can develop LNG projects with minimal IOC involvement. <ul style="list-style-type: none"> - technically challenging projects may require greater IOC involvement. - IOCs may bring additional financing credibility to some projects. ▪ IOCs compete to secure shareholding in LNG projects. ▪ NOCs select IOCs partly through who is involved in gas supply, access to market and relations. ▪ NOCs may choose to use an IOC to speed project development. 	Algeria Malaysia

[* Projects under construction]

[** Projects under development, pre-FID]

GLOSSARY

Aggregator	A company which purchases LNG from several sources and supplies LNG to several buyers and uses its LNG portfolio to its commercial advantage
Billion (or bn.)	1,000,000,000
IOC	International Energy (Oil) Company
Infrastructure	Roads, schools, houses etc.
Joint Venture	A commercial structure where several companies join together to develop a project in a “Joint Venture” company
NOC	National Energy (Oil) Company
QP	Qatar Petroleum
PNG	Papua New Guinea
Reserves	The amount of gas underground that can be commercially recovered (reserves are normally quantified in trillions of cubic feet (Tcf) or billions of cubic metres (BCM). The amount of gas in place underground is normally defined with a percentage of certainty that the gas can be commercially recovered.

The LNG value chain is made up of four elements:

Upstream	Exploration (searching) for gas and when found the production of gas.
Liquefaction	The process by which gas is cooled to minus 160 degrees centigrade, at which point it turns into a liquid and contracts 600 parts to 1.
Shipping	The movement of LNG in specialised tankers (not under pressure).
Regasification	The process whereby the LNG is converted back to gas through the addition of heat.