

MARKETING ALASKA'S GAS FROM AK LNG: KEY ISSUES

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POINT OF DEPARTURE

SB 138 laid out a path for the state to assume a 25% ownership stake in the Alaska liquefied natural gas project (AK LNG) and to take its royalty and production tax in kind rather than in value (i.e. in gas rather than cash). Hence, the state will derive the most value from AK LNG only if it sells its 25% share of the gas in an optimal way. Yet the state has no experience with marketing LNG, nor is it clear what "optimal" means; like any investment, marketing LNG carries risks and rewards, and so the state needs a framework to assess questions such as:

- Should the state be an active day-to-day manager, or should it be a passive investor who outsources marketing to a third party?
- How much gas will the state pre-sell before the project begins construction / operations, and how much will it reserve for selling later?
- Will the state sign short, medium or long-term contracts for the gas? If so, how many contracts, with whom and for what duration?
- How much price and/or volume exposure should the state assume?
- Should the state sell the LNG in Nikiski or should it partake in shipping?
- What intangibles might the state want from buyers—for instance, interest in taking ownership in the project or the ability to provide finance? And what other intangibles might the state be interested in pursuing (for instance, strengthening relationships with specific countries).

This paper introduces some key concepts about the marketing of AK LNG from the state's perspective by focusing on three areas:

- What are standard industry practices for marketing LNG?
- What are the core principles that should guide the state's marketing efforts?
- What are the levers available to the state to pursue its marketing strategy?

LNG MARKETING: INDUSTRY PRACTICES

LNG is sold in two ways:

- Under a term contract for a specific volume and duration. This term can be short (<1 year), medium (3-5 years) or long (10-25 years) and it can be for a specific volume or a range of volumes with a maximum and/or a minimum.
- A spot sale for one or a handful of cargoes, conducted either over the counter or through a more formal tendering process (initiated by the buyer or the seller).

Typically, transactions take place between an LNG project (seller) and an importer into a country (e.g. a utility). But this structure has become less common: the seller can have many supply sources from which to deliver LNG, or they may have no supply at all, promising to deliver LNG that they will have to buy from others. Similarly, the buyer can operate in many countries, or none at all, delivering cargoes based on market realities at any given time.

Despite this complexity, LNG marketing from new projects follows some patterns. Table 1 (next page) reviews the marketing efforts of new LNG projects that either took Final Investment Decision (FID) between 2012 to 2014, or that have made significant gains in marketing their LNG. Some observations are clear from the data:

- Projects typically pre-sell over 70% of their output on a long-term basis (20-years) before or soon after taking FID. (This is not shown in the table directly).
- Contract size varies from under 1 million tons per annum (mmtpa) to 4+ mmtpa (132 million cubic feet a day to 530 million cubic feet a day). The average contract size for this sample was 2.55 mmtpa.
- On average, projects had 2.9 counter parties (buyers). But some projects had just one buyer and others had as many as six.
- Each project typically sells to buyers from various geographies—from both a country as well as a continent perspective (Asia, Europe).
- About a third (30%) of the buyers had equity in the project—either because a project sponsor sold gas to themselves (e.g. PETRONAS in Malaysia or TOTAL in the Yamal LNG project) or a buyer acquired a stake and bought LNG from the project (e.g. CNPC in Yamal LNG or all partners in the Cameron LNG project).

In sum, there are some commonalities (for e.g. pre-selling a large share of the output before taking FID), but projects have also taken distinct paths in many respects, for instance, in the number of counter-parties (buyers), or in whether the buyers have ownership in the project, etc.

As such, we can expect that the AK LNG partners will pre-sell a large share of their gas before taking FID, but that other aspects of the marketing effort will depend on each partner's preferences and risk appetite.

Table 1. Contracts from Select New LNG Projects*Projects that took Final Investment Decision (FID) in 2012-2014, or nearing FID*

LNG Project	Buyer (Host country)	Volume	Term	Equity?
PETRONAS FLNG (floating) Malaysia FID in June 2012	PETRONAS (Malaysia) (assumed; no contract announced)	1.2 mmtpa	n/a	Yes
Sabine Pass, Trains 1-4 United States (L-48) FID in July 2012 (T1-2) FID in May 2013 (T3-4)	BG Group (UK) Gas Natural Fenosa (Spain) KOGAS (Korea) GAIL (India)	5.5 mmtpa 3.5 mmtpa 3.5 mmtpa 3.5 mmtpa	20 years 20 years 20 years 20 years	No No No No
Malaysia LNG, Train 9 Malaysia FID in March 2013	PETRONAS (Malaysia) (assumed; no contract announced)	3.6 mmtpa	n/a	Yes
Yamal LNG, Trains 1-3 Russia FID in December 2013	Gas Natural Fenosa (Spain) TOTAL (France) CNPC (China) Gazprom (Russia)	2.5 mmtpa 4 mmtpa 3 mmtpa 3 mmtpa	n/a 24 years 15 years 20 years	No Yes Yes No
Rotan LNG (floating) Malaysia FID in January 2014	PETRONAS (Malaysia) (assumed; no contract announced)	1.5 mmtpa	n/a	Yes
Cameron LNG, Trains 1-3 United States (L-48) FID in August 2014	GDF SUEZ (France) Mitsubishi (Japan) Mitsui (Japan)	4 mmtpa 4 mmtpa 4 mmtpa	20 years 20 years 20 years	Yes Yes Yes
Freeport LNG, Trains 1-3 United States (L-48) FID Target Q4 2014	Osaka Gas (Japan) Chubu Electric (Japan) BP (UK) Toshiba Corporation (Japan) SK E&S LNG, LLC (Korea)	2.2 mmtpa 2.2 mmtpa 4.4 mmtpa 2.2 mmtpa 2.2 mmtpa	20 years 20 years 20 years 20 years 20 years	Yes No No No No
Cove Point, Trains 1-2 United States (L-48) FID Target Q4 2014	Sumitomo Corporation (Japan) GAIL (India)	2.3 mmtpa 2.3 mmtpa	20 years 20 years	No No
Sabine Pass, Train 5 United States (L-48) Under development	TOTAL (France) Centrica (UK)	2 mmtpa 1.75 mmtpa	20 years 20 years	No No
Corpus Christi, Trains 1-3 United States (L-48) FID Target Q1 2015	PT Pertamina (Indonesia) Endesa (Spain) Iberdrola (Spain) Gas Natural Fenosa (Spain) Woodside Energy (Australia) Électricité de France (France) EDP Energias de Portugal S.A.	1.52 mmtpa 2.25 mmtpa 0.76 mmtpa 1.5 mmtpa 0.85 mmtpa 0.77 mmtpa 0.77 mmtpa	20 years 20 years 20 years 20 years 20 years 20 years 20 years	No No No No No No No
Average	2.9 counter-parties	2.55 mmtpa	20 years	30%

Source: enalytica based on company releases and industry press. Includes only the contract signed between the export project and the first recipient; some of these contracts include secondary sales agreements with third parties

FOUR CORE PRINCIPLES TO GUIDE THE STATE'S MARKETING EFFORTS

Given the variation in marketing approach, what principles might guide the state's marketing efforts?

What matters is performance over time. LNG contracts typically last for 15-20 years, and projects generally operate for longer; therefore, it makes no sense to judge a marketing approach based on how it is performing at any one point in time. Volatility is inevitable, and the objective is to design a plan that suits the state's interests over time, not a plan that delivers the best result at every point over a 20-year timeframe.

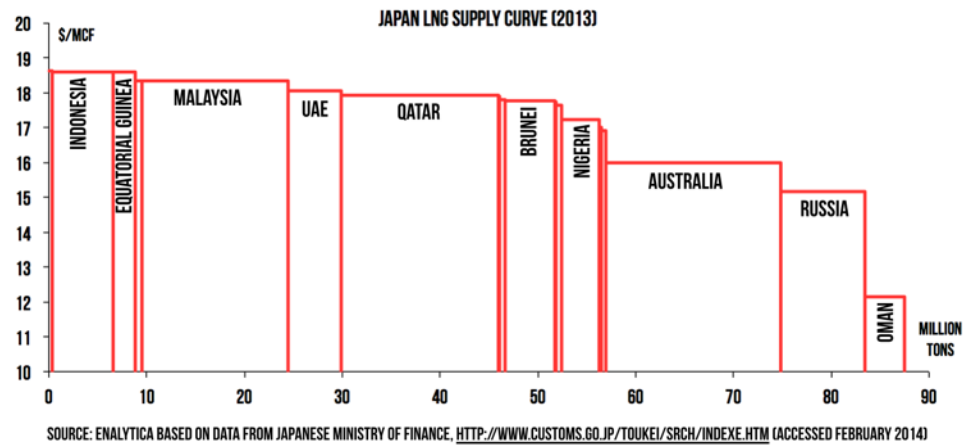
The goal is not the "highest" price but a risk profile to fit the state's needs.

It is similarly tempting to assume that a "good" strategy means getting the highest price possible. This is true up to a point, but since gas prices vary between and even within countries, it is often hard to know what the "highest" price is. Rather than chase a nebulous price target, the state of Alaska should develop a sales approach that matches its risk tolerance. For instance, a strategy focused on arbitrage will expose the state to different risks and rewards than a strategy aimed at securing a certain income stream and protection against volatility. Of course, as in any investment, the state can choose a mix of risks and rewards through a portfolio: the state could sell some gas at steady, predictable prices and some gas at more volatile prices. The essence of a marketing strategy is to develop an approach that matches the state's desired risk-reward relationship.

The state's risk profile is likely to differ than its partners' risk profile. There was much discussion during the 2014 Legislative Session about the role and obligations that the state's partners in the AK LNG (ExxonMobil, BP and ConocoPhillips) should assume regarding the marketing of the state's gas. In brief, there was a sense that selling the state's gas under the same terms and conditions that the oil majors earn would be an optimal strategy for the state.

Again, this sentiment is partly correct—the state has much to gain by leveraging its partners' experience and network. Yet by selling LNG through its partners, the state would also be assuming their risk tolerance—even though the state might have a different risk appetite. Any offers made by the AK LNG partners should be weighed on their individual merits and for their ability to satisfy the state's targeted risk-reward relationship.

In-house expertise can protect the state's long-term interests. The LNG market is highly fragmented, which means that transactions take place at wildly different prices. In such an environment, one cannot trust the "posted" price that might be referenced in the newspaper or the trade press. For instance, the graph below shows the price for LNG into Japan by different suppliers in 2013. Clearly, the "average" price is meaningless when there is a 50% variation between the lowest cost supplier (Oman) and the highest cost supplier (Norway). Understanding whether the price that one is getting is fair, requires a granular study of the market.



More importantly, LNG agreements are long-term deals, and many things change over 20 or 25 years, leading the parties to revisit and revise the terms of their agreement (contracts typically include such clauses that specify the conditions and boundaries for revisions). In such cases, the state can only safeguard its interests if it has an independent, in-house assessment of the market. Otherwise, it will rely on the opinions of others, and might find that it is being asked to make decisions it does not fully understand. Most sovereigns have found that deeper knowledge and expertise is the only guarantee for their interests over the long term.

LEVERS FOR ACHIEVING DESIRED RISK-REWARD RELATIONSHIP

Any LNG seller has several levers through which to achieve an optimum risk-reward profile. Broadly speaking, the state has the following levers:

Percent of output to pre-sell. Pre-selling the entire amount is standard practice and provides certainty that the LNG will be sold under set terms. Pre-selling LNG does not mean that the state has removed any uncertainty, however; the state will still be taking price or volume risk, depending on the terms of the contract(s). But by pre-selling, the state would, in effect, be saying that the certainty provided by selling LNG upfront is preferable to the uncertainty of marketing LNG later, even though it is possible that marketing later could generate greater returns for the state.

Counter-party diversity. The state will dispose some 4 mmtpa of LNG (25% of a 15-18 mmtpa project). Most LNG contracts are for volumes between 1.5 and 2 mmtpa, but the range goes from 0.5 mmtpa to 5+ mmtpa. In other words, the state could conceivably find one buyer for the entire 4 mmtpa, or it could find 6 or 7 buyers. Having one buyer is simpler logistically and operationally, but it carries a greater concentration of risk (what if there is a recession or some other event in the buyer's home market, and the buyer wants to renegotiate the contract or, even, cannot purchase the gas on the agreed terms?). This applies also to the option of the state selling LNG through one of the AK LNG partners—if one company buys the state's entire output, it could have leverage against the state in renegotiations. By contrast, more buyers means more complexity in executing and administering the contracts, but it brings greater diversification and possibly lower risk.

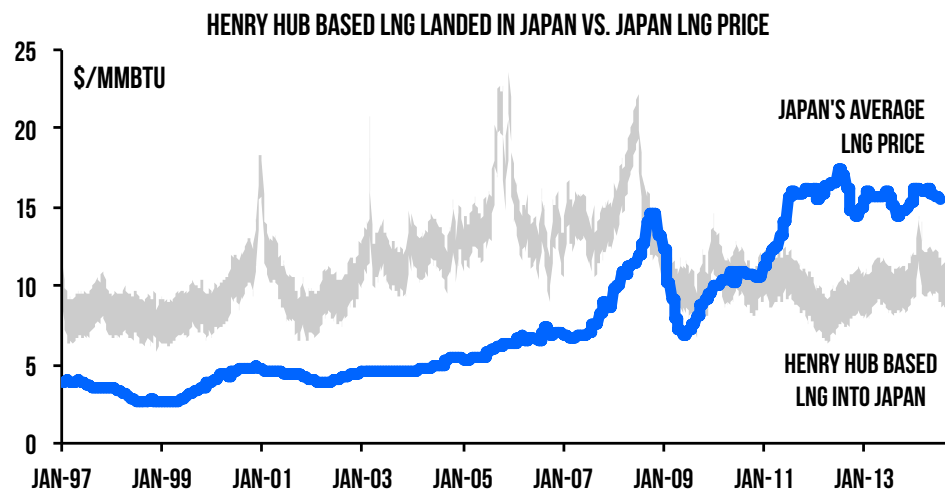
Besides the number of buyers, the state should think about its geographic exposure. A narrower reach (e.g. one target country) means simpler contract

administration (for example in travel time or in selling up a small office), but greater risk exposure in case something happens (e.g. an economic slowdown, a change in policy towards alternatives such as nuclear energy, a rapid growth in indigenous supplies, etc.).

The state is likely to encounter different types of buyers—for example, international oil companies, state-owned companies, or gas / power utilities. Different players have different business models, financial expectations, etc. Selecting a mix might be an appropriate form of risk management—for instance, an international oil company might offer a greater geographic reach through its global portfolio in a way that a single-country utility cannot.

Price exposure / volatility. In today's LNG market, buyers and sellers can assume three types of price exposure: Henry Hub (US gas market price), crude oil (through indexing the LNG price to oil) or the spot market (either by marketing LNG in the spot market or by pricing long-term volumes to a spot marker). Often, buyers and sellers select a mix either through hybrid pricing (e.g. 50:50 Henry Hub, oil) or through different contracts (one contract could be Henry Hub linked, another linked to oil).

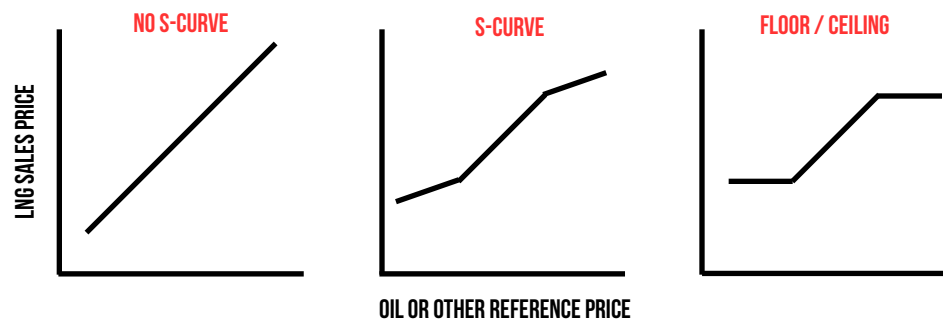
Different indexation regimes lead to different price exposures. The graph below, for instance, shows a hypothetical LNG project from the Gulf of Mexico delivering LNG into Japan based on a Henry-Hub formula (the structure is Henry Hub times a small premium to cover losses in the liquefaction facility, plus a liquefaction fee plus shipping). This price is plotted against Japan's average LNG price.



Several things stand out in this chart. First, the volatility is very different between the two prices, with Henry Hub being considerably more volatile than the Japan (oil-linked price). Second, the level (which price is higher) has been variable: until 2008, Henry Hub-based LNG would have been more expensive than other gas, while it was similarly priced in 2009-2010, and higher after 2011. Third, the two prices have not always moved in unison: sometimes they have (both up or both down), but other times they have not. This is another instance where the state's appetite for

price exposure might differ from that of its partners (who have different operations worldwide and different abilities to manage or hedge volatility).

Of course, volatility is defined partly by the commodity to which the LNG price is connected (Henry Hub, oil, spot market). But contract terms can also amplify or contain the volatility by placing floors or ceilings, or by setting how much of the price is fixed versus how much is variable. For instance, several LNG contracts contain “S-curves,” which smoothen the volatility of the LNG price based on changes in the oil price.



The schematic above explains how S-curves work. In a typical contract without an S-curve, the LNG price will rise and fall according to the benchmark price (in Asia, crude oil)—this is the example shown on the far left. But it is also possible to employ a S-curve relationship, whereby, after certain thresholds, the price of LNG falls or rises more slowly (middle chart). In extreme cases, the S-curve can turn into a ceiling and floor price for the LNG. Such a measure can be especially useful for projects like AK LNG which are particularly expensive and which might, therefore, be interested in ensuring a certain “minimum” return. In exchanges formula securing a floor price, however, the seller must give some of the upside (ceiling).

Volume volatility. All contracts allow for some up or down volume movement (take-or-pay provisions). But the state might be interested in securing a greater degree of volumetric certainty (and thus cash-flow certainty)—although it would have to give up something else in the negotiations.

Transfer point. Most likely, the state would sell LNG FOB (free-on-board) at the plant in Nikiski. But it could choose to sell the gas further upstream or even further downstream, by participating in the LNG shipping business (maybe as a part owner of the vessels with the buyers). Investment in shipping could be active or it could be passive—whereby the state merely puts some money to buy/build vessels and earns a return (charter rate) over time.

Interest in equity / ability to finance. Depending on the state’s willingness/ability to carry its 25% equity state, a buyer who is interested to buy an equity stake in the project might be a more desirable partner.

Relationship with buyer. Selling gas through third parties—as opposed to selling gas to third parties—is administratively simpler as the state can assume a secondary role and benefit from the marketing efforts of its agent. But this approach carries two downsides: it forces the state to adopt the risk profile of the agent/seller thus preventing the state from selecting a risk exposure that fits its interests well now and in the future; and it prevents the state from developing deeper in-house marketing expertise to monitor market developments and ensure that the state is deriving maximum value from its gas.

ABOUT US



Janak Mayer. Before co-founding enalytica, Janak led the Upstream Analytics team at PFC Energy, focusing on fiscal terms analysis and project economic and financial evaluation, data management and data visualization.

Janak has modeled upstream fiscal terms in all of the world's major hydrocarbon regions, and has built economic and financial models to value prospective acquisition targets and develop strategic portfolio options for a wide range of international and national oil company clients. He has advised Alaska State Legislature for multiple years on reform of oil and gas taxation, providing many hours of expert testimony to Alaska's Senate and House Finance and Resources Committees.

Prior to his work as an energy consultant, Janak advised major minerals industry clients on a range of controversial environmental and social risk issues, from uranium mining through to human rights and climate change. He has advised bankers at Citigroup and policy-makers at the US Treasury Department on the management and mitigation of environmental and social impacts in major projects around the world, and has undertaken macroeconomic research with senior development economists at the World Bank and the Peterson Institute for International Economics.

Janak holds a BA with first-class honors from the University of Adelaide, Australia and an MA with distinction in international relations and economics from the Johns Hopkins School of Advanced International Studies (SAIS).



Nikos Tsafos. Nikos Tsafos has a diverse background in the private, public and non-profit sectors. He is currently a founding partner at enalytica. He previously spent 7 ½ years at PFC Energy, where he advised the world's largest oil and gas companies on some of their most complex and challenging projects; he also played a pivotal role in turning the firm into one of the top natural gas consultancies in the world, with responsibilities that included product design, business development, consulting oversight and research direction.

Prior to PFC Energy, Nikos was at the Center for Strategic and International Studies (CSIS) in Washington, DC where he covered political, economic, and military issues in the Gulf, focused on oil wealth, regime stability and foreign affairs. Before CSIS, he was in the Greek Air Force, and prior to his military service, Nikos worked on channeling investment from Greek ship-owners to Chinese shipyards.

Nikos has also written extensively on the domestic and international dimensions of the Greek debt crisis. His blog (Greek Default Watch) was listed as one of "Europe's Top Economic Blogs" by the Social Europe Journal, and his book "Beyond Debt: The Greek Crisis in Context" was published in March 2013.

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