02-16-15 PRESENTATION: HOW LNG AFFECTS LOCAL MARKETS AND MARKETING ALASKA'S GAS BY ENALYTICA

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HOW LNG AFFECTS LOCAL MARKETS? LESSONS FOR ALASKA FROM WESTERN AUSTRALIA

JANUARY 2015

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POINT OF DEPARTURE

The Alaska liquefied natural gas (AK LNG) project will reshape Alaska's gas market. In a state that consumes ~250 million cubic feet a day (mmcf/d), AK LNG will produce 2.5 to 3 billion cubic feet a day (bcf/d) for export and local use. Experience shows that LNG projects impact local markets profoundly. Often, they supply large volumes to the domestic market, but more importantly, they create a connection between local and foreign markets, thus changing the incentives and expectations of the participants in the local market. Producers have a new outlet for their gas and weigh whether to sell it locally or abroad; consumers and sovereigns worry that exports might take priority over domestic markets, jeopardizing access to competitively priced gas for the local economy.

In assessing these impacts, Alaska can look at how LNG exports have affected or will affect other jurisdictions. Studies for the US Department of Energy have shown that LNG exports from the Lower 48 will raise prices, although the magnitude of those increases will depend on many factors. Elsewhere, the press has focused on Eastern Australia where three LNG projects are being built with a total capacity of ~25 million tons per annum (mmtpa), slightly more than AK LNG's 17-18 mmtpa. In E. Australia, prices have risen and gas buyers complain that they cannot sign long-term contracts for gas.

These experiences suggest that LNG exports could raise prices for Alaskans. Yet, these case studies are not the proper analogs for Alaska. First, in both areas, LNG is coming from the same resources that feed the local market—as such, there is a stronger link between them. (In the Lower 48, LNG exports are even priced based on local prices.) Second, E. Australia started LNG exports in late 2014 / early 2015, while LNG exports have yet to start from the Lower 48. Without the benefit of hindsight, we might see only part of the picture or rely too much on models rather than facts. And third, LNG sales from E. Australia outstripped the effort to find and produce gas (as evidence, the project with the most developed resource base is selling gas to the other two projects so they can meet their contractual obligations) —this, again, is unique.

LESSONS FROM WESTERN AUSTRALIA

Instead, we would suggest that Western Australia offers a more compelling analog. Western Australia (WA) has exported LNG since 1989 and has dealt with these issues for a longer time than most jurisdictions—first with bilateral agreements and then a firm policy requiring that LNG projects sell 15% of their gas to the local market. Here are the five lessons that Alaska could learn from WA:

1. There is no a priori relationship between export and domestic prices. Intuition suggests that domestic and export prices will correlate and converge (allowing for a difference in investment costs); in practice, the link is complex, and there has been no consistent relationship between domestic and export prices since 1989. Export prices have risen over time, albeit irregularly, reflecting changes in the price of oil, in contract terms and in the exchange rate between the Australian and US dollars (which raised the value of US$-denominated LNG when expressed in Australian dollars). By contrast, domestic prices were falling until about 2005.

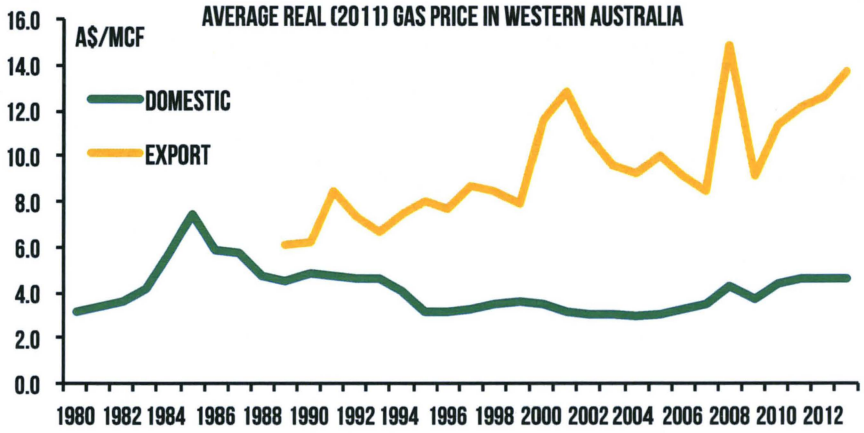
The stronger correlation post 2005 is plausibly linked to an external factor that affected both domestic and external prices: the boom in commodities that pushed up oil and oil-linked LNG prices, led to a rise in gas production costs, and created additional demand for gas from Australia's mining sector. In this tighter market, even companies with no access to LNG exports, like Apache, secured higher gas prices for new fields. What matters is context—supply and demand, regulation and market structure.

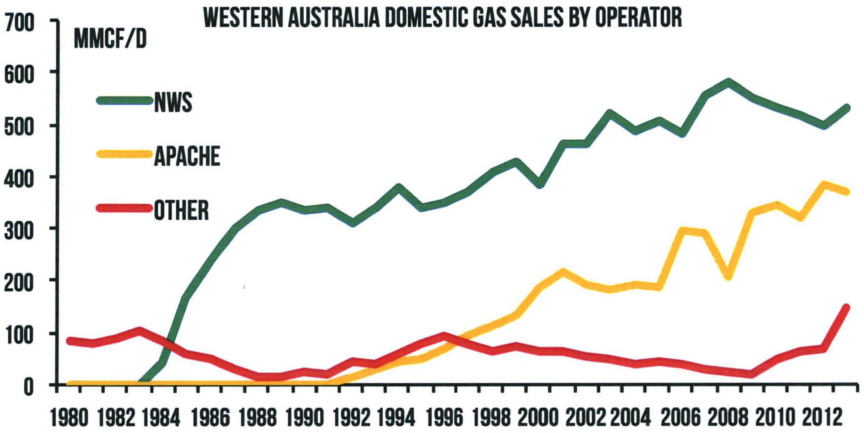
2. Just because exports are possible does not mean that all producers will prefer exports to local markets. The gas market in WA expanded based on gas from the North West Shelf (NWS) project (domestic gas started in 1984 and LNG exports in 1989). But the next tranche of gas has come largely from non-NWS sources, which supplied 50% of the market in 2013 (up from less than 5% in 1989). Some of these companies have LNG aspirations, but others not; for example, Apache, the second largest operator in WA after NWS, first participated and then sold its interests in an under construction LNG project. LNG has a capital demand and risk profile that many companies avoid. Just because exports are possible does not mean they are everyone's preferred option.

3. In the 1980s, WA's reservation policy created an overhang that depressed prices and stymied investment. In an effort to secure enough gas for the local market, the state bought too much of it from NWS. The state agency that signed the contract had to pay millions in take-or-pay penalties, while the supply overhang led to a 34% drop in real prices from 1985 to 1990. Low prices stymied investment, and NWS ended up with a 96% market share in 1989 as other suppliers were squeezed from the market.

4. The domestic reservation policy is leading LNG projects to pay attention to the local market—but markets still matter. The (under construction) Gorgon LNG project said that it was only planning to supply the local market because it had to; but Gorgon is staggering its sales contracts over time to avoid flooding the

market. Wheatstone LNG is building a processing plant for local gas but has not announced any sales deals. Pluto LNG will sell gas to the local market only if it is commercially viable—and it has a five-year grace period after LNG starts flowing to test commerciality (and to agree with the state on what "commerciality" actually means). In sum, the domestic reservation policy is leading project developers to pay attention to the local market—but domestic sales are still subject to market forces.





Sources: (1) Government of Western Australia, Department of Mines and Petroleum, Quantity and Value 2013; Australian Bureau of Statistics, Consumer Price Index; (2) Australian Petroleum Production & Exploration Association (APPEA), Annual production statistics 2013

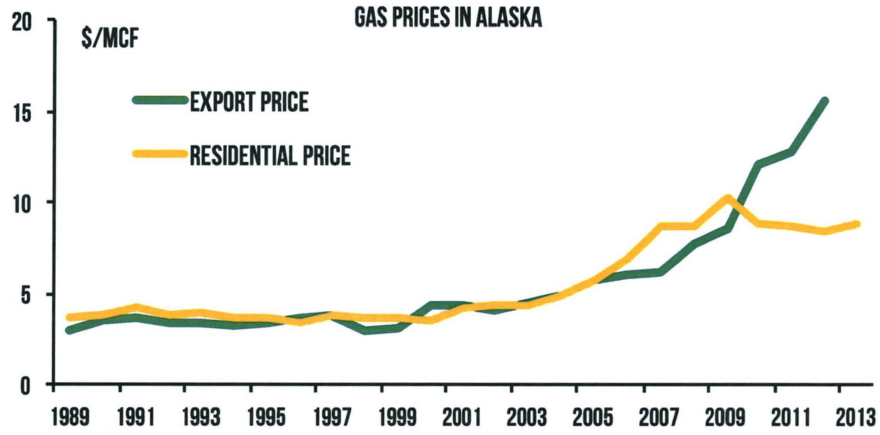
5. Policy and advance planning is no substitute for close oversight and diligent regulation. LNG creates unique regulatory challenges. Exports often require gas aggregated from many fields, creating a need for regulators to ensure a fair balance between aggregation and a company's lease terms obligations. Joint venture marketing—which happens often in LNG projects—can create too much seller concentration in the smaller, local market. A domestic reservation policy leads projects to focus on local markets, but it can also create tensions about whether sales are "commercially viable," and it can dissuade competitors from investing to

bring new gas into a market that could be flooded with LNG-linked domestic gas. And a domestic reservation policy does little to address problems such as high concentration of buyers and sellers, lack of transparency and liquidity, insufficient investment in infrastructure, and so on.

These challenges call for smart and continuous regulation. As such, rather than rely on a crude policy tool—a domestic reservation policy—WA is strengthening other options: better market instruments, more competition, separate rather than joint marketing of gas, and so on. Rather than ask "how do we balance local and export markets," WA is asking "how do we develop a better market given that LNG exports exists and are possible."

IMPLICATIONS FOR ALASKA

Alaska's experience confirms these lessons. First, Alaskan prices have sometimes correlated with exports, and other times they have not, depending on whether market participants and the Regulatory Commission of Alaska (RCA) have agreed that prices should be linked to the Henry Hub marker in the Lower 48. Second, prices in the Cook Inlet in recent years have been driven by local market forces, not export prices. And third, the entry of smaller players like Hilcorp underscores that even export-oriented areas can attract players who are chiefly focused on the local market—and that the activity of such players is a key determinant for local prices.



Source: US Department of Energy, Energy Information Administration

WA should also act as a caution, however. It is tempting for Alaska to make sure that local demand is met before LNG exports; but there is always a risk that in doing so, the local market could be flooded to the point that new entrants could be dissuaded from exploring for and producing gas. This is exactly what happened in WA, and it was the unintended consequence of a policy with a strong domestic-market bias. As such, the final lesson from WA is the most important: Alaska should be thinking about a broad policy toolkit to encourage functioning markets rather than focus on the narrow question of how AK LNG will affect local prices.

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.

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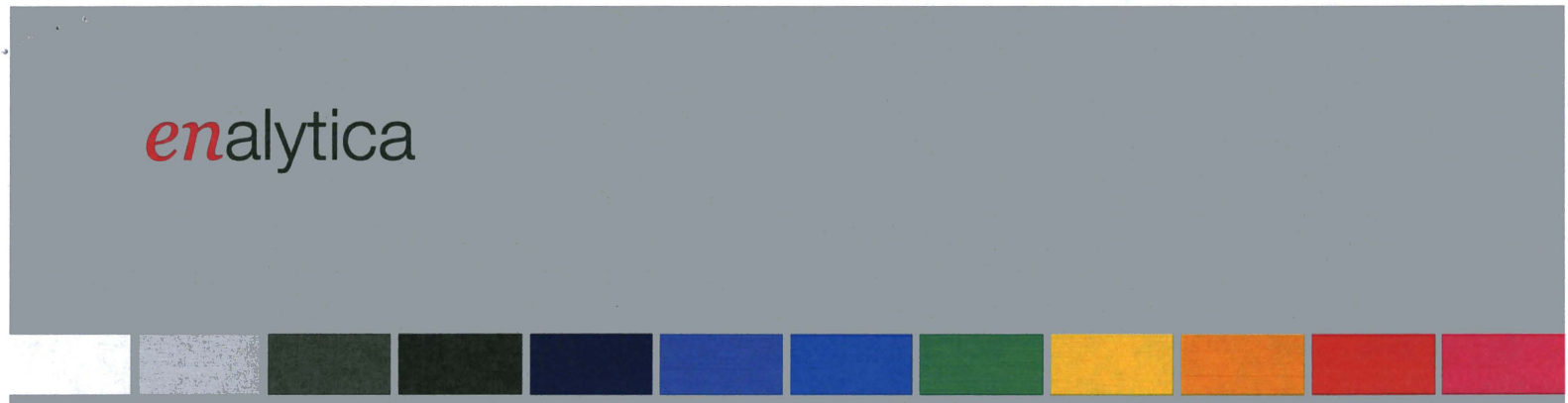
Nikos Tsafos. Nikos Tsafos has a diverse background in the private, public and non-profit sectors. He is currently a founding partner at enalytica. He previously spent 7 ½ years at PFC Energy, where he advised the world's largest oil and gas companies on some of their most complex and challenging projects; 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.

Nikos holds a BA with distinction in international relations and economics from Boston University and an MA with distinction in international relations from the Johns Hopkins School of Advanced International Studies (SAIS).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MARKETING ALASKA'S GAS FROM AK LNG: KEY ISSUES

JANUARY 2015

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

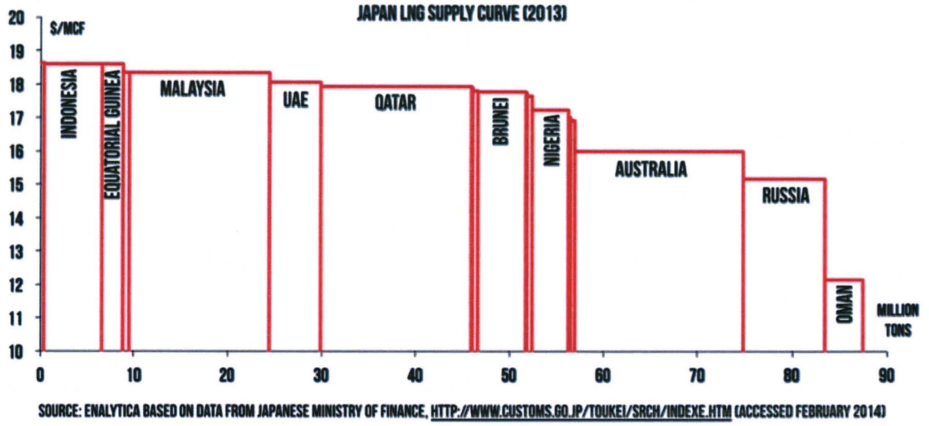
What matters is performance over time. LNG contracts typically last for 15-20 years, and projects generally operate for longer; therefore, it makes no sense to judge a marketing approach based on how it is performing at any one point in time. Volatility is inevitable, and the objective is to design a 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.



SOURCE: ENALYTICA BASED ON DATA FROM JAPANESE MINISTRY OF FINANCE, HTTP://WWW.CUSTOMS.GO.JP/TOUKEI/SRCH/INDEXE.HTM (ACCESSED FEBRUARY 2014)

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 conceivable find one buyer for the entire 4 mmtpa, or it could find to 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.

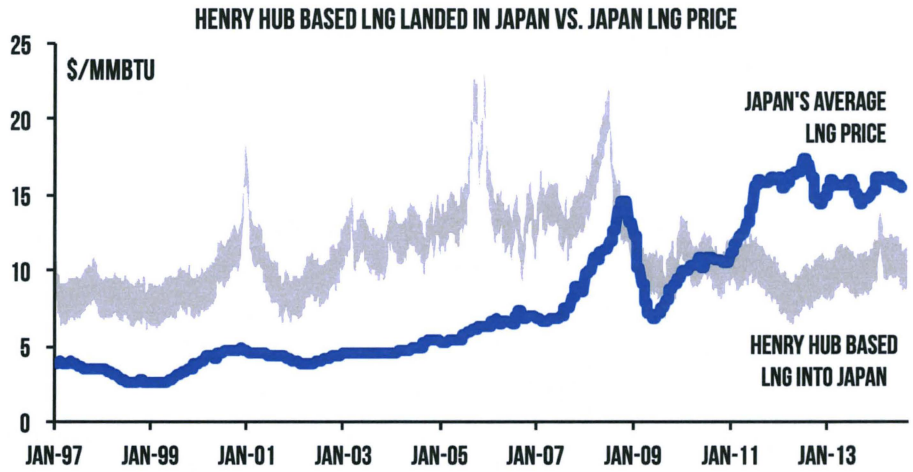
Besides the number of buyers, the state should think about its geographic exposure. A narrower reach (e.g. one target country) means simpler contract

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).

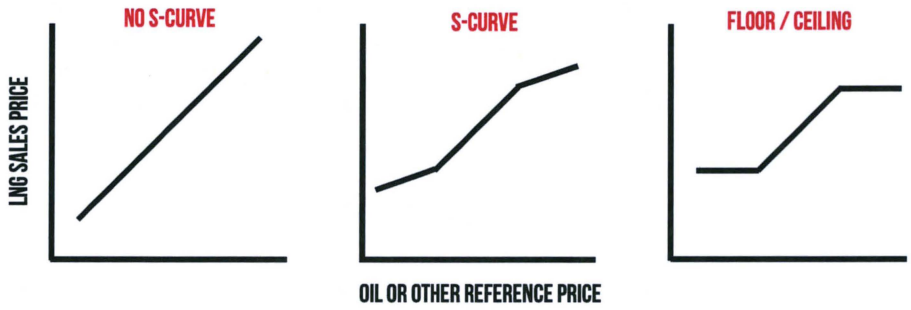
Different indexation regimes lead to different price exposures. The graph below, for instance, shows a hypothetical LNG project from the Gulf of Mexico delivering LNG into Japan based on a Henry-Hub formula (the structure is Henry Hub times a small premium to cover losses in the liquefaction facility,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

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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.

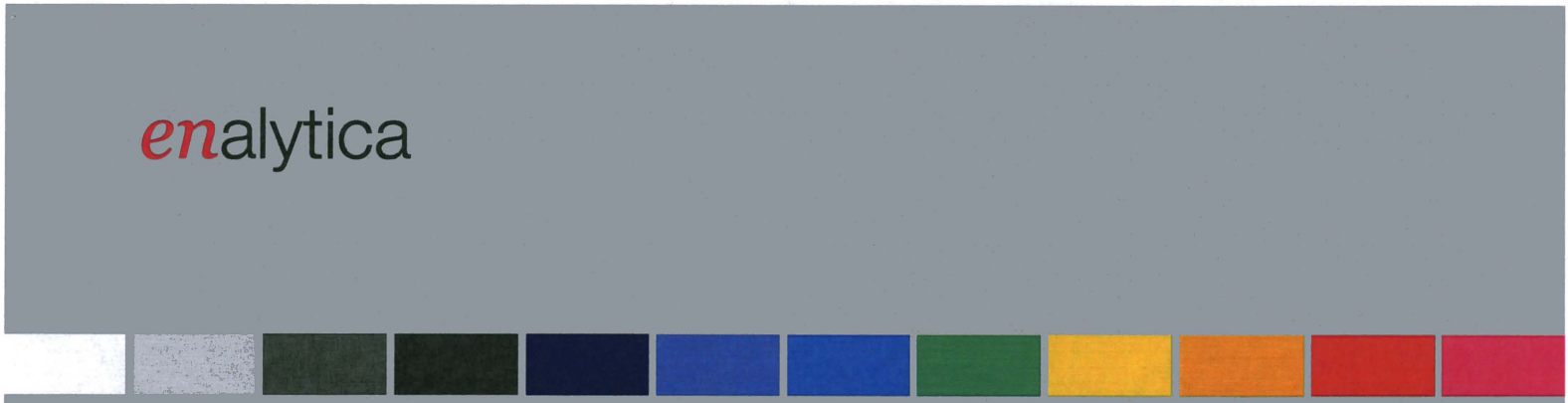
Janak holds a BA with first-class honors from the University of Adelaide, Australia and an MA with distinction in international relations and economics from the Johns Hopkins School of Advanced International Studies (SAIS).

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.

Nikos holds a BA with distinction in international relations and economics from Boston University and an MA with distinction in international relations from the Johns Hopkins School of Advanced International Studies (SAIS).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ALASKA LNG (AK LNG):
PROJECT OVERVIEW AND UPDATE

Presentation to House Resources Committee
Juneau, Alaska › Wednesday, January 28, 2015

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	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Project Stage	Pre-FEED			FEED			Construction					Online	
Project Milestones	Move to FEED			FID								Debottleneck / expansion	
Marketing	MOU/HOA SOA Plan			HOA/SPAs SOA Plan			SPAs for any unsold LNG						
Financing	Initial talks			Defining terms / signing loans			Possible additional financing					Refinance	
Project Structure & Ownership	Define initial structure			New partners / redefine ownership			New partners / redefine ownership					New partners possible	
Investment (Project)	$400–$500 mm			$1,500–$2,000 mm (Equity)			$45–65 billion (Debt and equity)					O&M Met from cash flow	
Investment (SOA)	$50–$125 mm			$200–$500 mm (Equity)			$6–$15 billion (Debt and equity)					O&M Met from cash flow	

THE AGENDA FOR THE NEXT 12-18 MONTHS

Technical	Driving down costs, route, location, etc.
Commercial	Domestic gas, off-take and balancing, LNG disposition, financing
Organizational	Joint-venture agreements, lease modifications
Fiscal	Form of fiscal stabilization, property tax
Regulatory	Progress towards export approval and FERC permitting process

SELLING LNG: PATTERNS FROM RECENT PROJECTS

Share to pre-sell	Over 70% in long-term (20-years) contracts before or soon after taking FID
Counter-parties	Average 2.9 buyers per project (range from 1 to 6)
Price exposure	US projects linked to Henry Hub; others mostly oil-linked
Contract size	1 million tons per annum (mmtpa) to 4+ mmtpa (132–530 mmcf/d)
Transfer point	No trend between FOB/DES; increasing tendency to destination flexibility
Equity partners	About a third (30%) of the buyers had equity in the project

Focus on performance over time

LNG contracts last a long time; volatility is inevitable, and the goal is 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.

Focus on risk not the "highest" price

The highest price today may not be the highest price tomorrow; and the highest price could mean being priced out of a market and having LNG unsold; the state should focus on understanding its risk tolerance and developing a portfolio mix that serves its exposure appetite.

Don't outsource your risk profile

Selling LNG through its partners, the state would also be assuming their risk tolerance—even though the state might have a different risk appetite. Judge offers on their ability to satisfy the state's risk profile.

Build in-house expertise

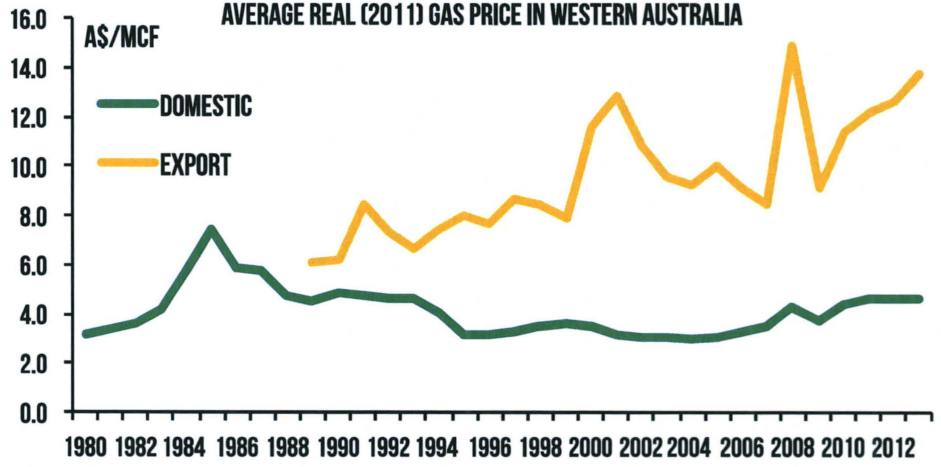
The LNG market is highly fragmented, and expertise makes a difference; an autopilot approach will not serve the state's interests over the long term.

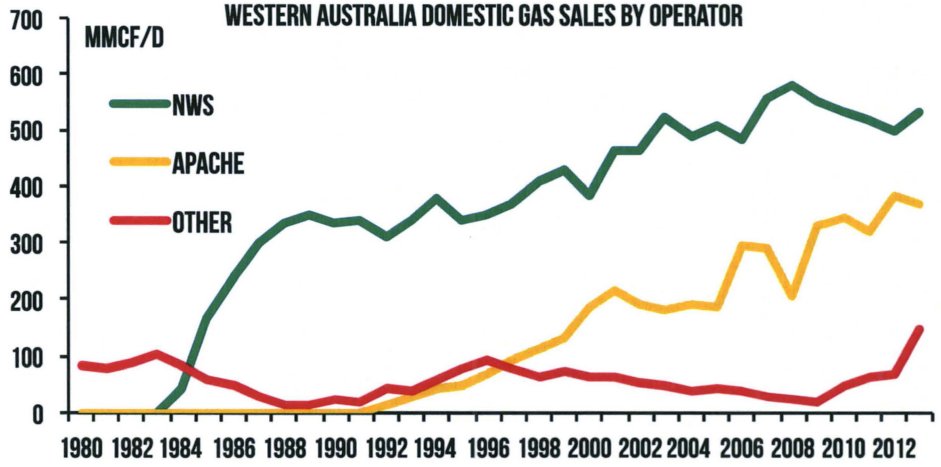
WHAT LEVERS DOES THE STATE HAVE?

Share to pre-sell	Does Alaska want to pre-sell 100% of its output?
Counter-parties	How many counter-parties? Few are simpler but concentrate risk
Price exposure	Oil vs. Henry Hub indexation; S-curves and other protections
Volume risk	How important are steady sales to the state?
Transfer point	Will the state be involved in shipping?
Equity partners	Will the judge select buyers based on their interest to invest in AK LNG?
Intangibles	What other interests does the state have? For example, links to foreign sovereigns

LNG and domestic gas in Western Australia

1. No set link between export and domestic prices.
2. Companies will still want to produce gas for local market even though exports are available.
3. WA's reservation policy created an overhang in 1980s that lowered prices and stymied investment.
4. Reservation policy leading LNG projects to pay attention to local market–but markets still matter.
5. Policy and advance planning is no substitute for close oversight and diligent regulation.





Sources: (1) Government of Western Australia, Department of Mines and Petroleum, Quantity and Value 2013; Australian Bureau of Statistics, Consumer Price Index; (2) Australian Petroleum Production & Exploration Association (APPEA), Annual production statistics 2013

HOW WILL LNG IMPACT DOMESTIC GAS IN ALASKA?

Alaska's own experience fits Western Australia case study

. Domestic prices have sometimes correlated with exports, and other times they have not.

. Prices in the Cook Inlet in recent years have been driven by local market forces, not export prices.

. Entry of smaller players shows that you can attract players who are chiefly focused on the local market.

Path forward for Alaska

. Tempting to make sure that local demand is met before LNG exports; but there is always a risk that in doing so, the local market could be flooded to the point that new entrants could be dissuaded from exploring for and producing gas.

. Alaska should be thinking about a broad policy toolkit to encourage functioning markets rather than focus on the narrow question of how AK LNG will affect local prices.

VARIOUS FINANCING OPTIONS OPEN TO LNG PROJECTS

Balance Sheet Finance

Project sponsors provide funds

Funds can combine debt and cash flow

Guaranteed by project sponsor (recourse)

Rate depends on sponsor's balance sheet

Easier if all parties have strong balance sheets

Project Finance

Third parties lend to project directly, not to sponsors

Sponsors put up some equity (e.g. 30%)

Guaranteed by projected revenues (non-recourse)

Rate depends on project risk

Easier to accommodate riskier sponsors

Key Questions for State of Alaska

What mix of debt and equity?

Will debt be specific to LNG project, or broader state balance sheet liability?

Will equity come from recurrent revenues, or other sources?

What role does the permanent fund play and how does this affect restricted / unrestricted revenue?

PROJECT FINANCE WELL ESTABLISHED IN LNG

IHS estimates that LNG projects raised over $97 billion in third-party financing since 2000

Financing from project sponsors, export credit agencies, multilateral banks and commercial banks

Commercial loans can also secure sovereign guarantees as insurance

The Japan Bank of International Cooperation (JBIC) is the largest single provider of funds

Examples

Australia Pacific LNG	$5.8 billion	US EXIM, China EXIM, banks
Ichthys	$20 billion	JBIC, Korea and Australia EXIM, banks, sponsors ($4 bn)
Papua New Guinea	$14 billion	Six ECAs and 17 banks, ExxonMobil
Peru	$2.25 billion	IADB, US EXIM, Korea EXIM, IFC, others
Sakhalin-2	$6.4 billion	JBIC, NEXI, banks
Tangguh	$3.5 billion	JBIC, ADB, banks

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