Alaska Natural Gas Export: 
Fiscal Stability versus the State’s Constitution

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Abstract

This article looks at incentives to induce an Alaskan Liquefied Natural Gas (LNG) export project. In particular it looks at the Alaska state fiscal system of oil and gas taxes and how that system can help or hinder such an LNG project. Currently any LNG project faces a thin profit margin with massive upfront costs and much revenue risks. In addition, Alaska's fiscal (tax) system has been changed over the years creating another layer of risk that can give a risky project little upside potential to counteract downside losses. One way to reduce those risk factors is to have a long term fiscal (tax) contract from the state where the investor can be sure that there will not be any risk of tax system change, which is often termed “fiscal stability.” However, the Alaska states’ constitution does not allow the state to execute a tax contract. Therefore such a project in Alaska may be too risky to do. This paper looks at the state of Alaska’s constitution and how it can affect a potential LNG export project, and the paper looks at an alternative way for Alaska to create a long term fiscal system (tax) contract by using Article 8 of the Alaska constitution. That article stipulates the ideal of maximizing the value of state owned resources.
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1. Introduction

Alaska has rather large reserves of natural gas on the North Slope, and therefore Alaska has long thought about exporting its vast natural gas resources to the Pacific Rim, and even to the United States Lower 48 states. However, in order to monetize those reserves, they must be transported 800 miles away to get to the nearest ice free port, and once brought to tide water, they must be liquefied into liquefied natural gas (LNG) and sent by LNG tanker to markets on the Pacific Rim. Therefore it is quite expensive to build an Alaskan LNG export project. The high costs involved include the construction of a large 800 mile long pipeline built on both continuous and discontinuous permafrost ground. There is also a need to build liquefaction trains on the south shore and a gas treatment plant (GTP) on the North Slope. Because of these expensive requirements, Alaska’s North Slope natural gas resource has been deemed too far away to be economically feasible to get to market. The long distance requires a costly pipeline whereas other competing LNG exporters have their natural gas reserves right on the coasts and therefore only need to build LNG liquefaction trains, with no long pipelines, in a slow determined build up that incurs much less risk. Alaska needs to build a huge project all in one swoop. Nevertheless, with current high prices for LNG on the Pac Rim, now may be the “window of opportunity” for Alaska to jump into the LNG market.

However, considering the long lead time in permitting, planning and construction of any project, and the long pay back needed for any LNG project, it is not wise to hurry a project along in the hope of gaining a temporary blip of LNG value. Rather, any LNG project must have the prospect of sustainable values for as long as 50 years before it can be feasibly done, or the current producers will never sell their gas. This is because even a small 36 inch pipeline project can take 5 years to permit, 5 years to plan and build and up to 30 years to obtain a payback. Other projects will take longer. Plus some typical oil price based contracts that are available now, may not happen due to massive supplies of LNG that may soon become available. Therefore, we need to look at what future contracts will look like.

One way to understand a given project’s feasibility is not to look at currently negotiated LNG contracts, but rather to look at which way Pac Rim contract prices are likely to move in the future. In order to predict those prices and contracts, both a market analysis and forecasts must be done. Unfortunately, such a forecast cannot be a mere time trend of current market trends, rather it has to include rational expectations of future prices made up of expected market structures that are considered most likely to occur. Financial parties, such as buyers, sellers and shippers of the natural gas, are going to determine, with rational expectations, when and where the markets will turn.

However on to top of the long pipeline issue for an Alaskan LNG project, another issue involves the reduction of oil production in the Prudhoe Bay and Point Thompson oil reservoirs. Currently, both oil and gas are produced on the North Slope but the gas is separated from the oil and conditioned in order to make miscible injectants and pure natural gas that are both pumped back into the reservoir in order to maintain pressure and sweep more oil out. If a natural gas LNG project is built, there will be natural gas off-takes from the oil reservoir, which could reduce the ultimately recoverable oil reserves and cause oil value destruction in the oil operations.

Another issue is United States laws on natural gas exports where in order to be allowed to export natural gas, the natural gas producers need an export license from the department of energy. Another issue is the high cost of construction in Alaska for any large diameter pipeline. Not only are labor and capital costs quite high in Alaska, but there are specific problems with Alaska regarding continuous and discontinuous permafrost regions where the pipe is laid. Some of these issues require expensive classified gravel to be developed and trucked to the pipeline bedding so that the pipeline can withstand extreme cold and hot summer temperatures with heavy rain. These harsh weather conditions can create ice lenses under a pipeline, even when deep underground, which build up and can cause ruptures.
While many of these problems can be resolved, one of the largest issues over the years has been Alaska’s oil and gas tax issue and in particular Alaska’s constitution that specifies that Alaska may not bind tax rates for future legislatures. This tax authority issue is interesting and indeed is an issue for many oil and gas countries and regions around the world. In this paper, we will analyze the Alaska constitutional tax issue and analyze one way to deal with that issue by using another section of the Alaska State constitution, namely the Article 8 provision, which provides for the maximization of Alaska State resource value.

First, we will model a simple cost, value and tax model to show how the price volatility and risk of an LNG project looks. If we look at a specific model of costs, values and profits, we can find where the risks are including cost overrun risks, LNG price volatility risks and fiscal system (tax) change risks. Then we will show how taxes can affect this risk and why a tax contract can help. Then we will show why the state constitution does not allow a tax contract. Finally we will look at another option that the state could use to obtain fiscal stability, namely by using Article 8 of the constitution, the maximization provision.

2. LNG Market Analysis

Many Alaskans have said that there is a “window of opportunity” to get an Alaska LNG project on line and ready. However, as an Alaska LNG project is easily a 50 year project in the making due to permitting, construction and other considerations, therefore if the price of LNG during that 50 year period does not look to be more than the cost, then the entire project is not feasible and cannot be financed or planned. Plus currently available oil price based contracts may not be executed due to oil production availability and won’t be available later, in which case we need to consider what a future natural gas price and contract is likely to be. The LNG market for Alaska depends on many factors; however, current market trends should not be used to determine the feasibility of any project nor should current market contracts. Rather a future market analysis is needed.

The only reason much effort and planning went into a large Alaska pipeline project to the Lower 48 five years ago was because selling natural gas to the Lower 48 looked to be able to provide a large liquid and stable market and because no one knew that shale gas was possible and would reduce natural gas prices by 75% below the oil price per MCF equivalent. However, looking forward, shale gas from around the world could easily swamp many current markets including the Pac Rim market. Plus the Pac Rim is not a very liquid market, and therefore most supplies are bought and sold based on long term contracts. Nevertheless, an LNG project may be successful because the recent price of natural gas is quite high in the Pac Rim. The question is, will that price remain high, especially since recent Gulf of Mexico contracts suggest that LNG in-port in Louisiana but on the water will be bought and sold for as low as $6 per MCF for the foreseeable future. This suggests that it may not be long before Pac Rim LNG prices will slowly decline. Therefore, there are three parts of a market analysis needed before any Alaska project can be deemed feasible:

- There needs to be enough up-stream supplies,
- There needs to be enough down-stream demand at a sustainable price, and
- The oil-to-natural gas price relationship may need to be favorable.

There are the three specific LNG projects that Alaska could pursue and that need to be analyzed. Those include a 42 inch pipeline to tidewater with a liquefaction facility at 4 BCF per day, a 36 inch pipeline to tidewater with a liquefaction facility at 2 BCF per day, and a 36 inch pipeline to South Central Alaska at ½ a BCF per day that could be made expandable. Each one of these options has strengths and weaknesses that need to be combined in an overarching analysis. The first two pipelines need to be analyzed in regard to any tidewater location just to make sure they are feasible while the third has to addresses South Central Alaska issues in order to make sure its low capacity design can be adequately coordinated with state needs as a small project will depend less on LNG exports in order to cover its costs.

Up-stream Supply

Many Alaskans are intensely interested in developing natural gas in order to gain jobs, state revenue and a new industry, however, if we are to study the value that royalty gas can give to the state in general and the leveraging ability royalty gas can give to developing an LNG project in particular, that analysis would not be complete without a thorough analysis of oil reserve destruction that is possible. There can be much oil value destruction with an LNG project, where the high production of natural gas ruins the oil field pressure and less oil
is produced. This is where it is important to look closely at oil field petroleum engineering to approximate what oil field value destruction will occur, if any. As such it may be necessary to wait to export gas, produce most of the oil first, and then develop the natural gas later as an exporting industry. We suspect that if the natural gas is developed correctly, there should not be any oil value destruction. Nevertheless the producers need to study the idea of how developing natural gas brings both benefits and costs, i.e. the cost of reduced oil value. In addition there is still a major question as to current availability of natural gas reserves.

Currently, any large Alaska natural gas pipeline project of 42 inches (roughly 4 billion BCF per day) or 36 inches (roughly 2 BCF per day if put at full capacity) will need more supplies from the North Slope than are currently available proven to exist at a P1 level. That suggests that they each have supply challenges. Although many articles maintain that the North Slope has 35 TCF of natural gas reserves, really there may be as little as 20 TCF or less when losses and other factors are considered. A 4 BCF project may only last 15 years with current reserves, not enough time for a payback, and a 2 BCF per day project, would not last much more than 22 years considering the dynamics of the oil and gas field production scenarios. Therefore these projects would be challenged to earn a long enough payback to be financed. In addition much natural gas at Point Thompson and at Prudhoe Bay may still be required for greater pressure maintenance in order to induce additional oil production. A ½ BCF per day project could last as long as 35 years, with current reserves.

This means that in order to undertake a large LNG project, there may need to be additional P1 proven reserve developed in ANWR, Mackenzie Delta and possibly the Beaufort Sea in order for a large pipeline project to be feasible. Therefore, we need to look at the issue of whether ANWR can be opened or whether a pipeline from Mackenzie Delta can be permitted and built, or whether the Beaufort Sea projects will move forward. One of the reasons that the large pipeline project to Alberta and the Lower 48 had such optimism was because since the project went to Canada and to the Lower 48, it had the chance to induce the political will to open up ANWR to exploration and production and possibly even allow Mackenzie Delta to connect to the North Slope and to allow Beaufort Sea exploration. If ANWR, Mackenzie Delta and the Beaufort Sea are opened up, then that would give the North Slope enough natural gas reserves that it can comfortably support a very long term export project. Timing then is essential.

**Downstream Demand**

Even though the BRIC (Brazil, Russia, India and China) countries have grown quickly over the last ten years, still coal has been cheaper than natural gas on the Pacific Rim and elsewhere making it hard to sell LNG for electric power to developing countries. Japan has bought LNG at premium prices due to its reluctance to use coal and because of the Fukushima disaster, which took nuclear power plants out of commission for safety reasons. However, China has yet to embrace the purchase of massive quantities of LNG and piped in natural gas to meet its electric power needs. Therefore, a trend of Chinese demand for natural gas should be looked at as Figure 1 shows. Figure 1 shows the trend China and Japan would have taken over the last decade and suggests what their trend will be over the next decade. Because Japanese growth rates have slowed, they have not reached the demand potential suggested by the figure, but China has exceeded its demand potential.
Many developing countries, including China, will continue to be reluctant to use LNG when coal is readily available for a reasonable price and global warming concerns are much less relevant in developing Asia. It may well take China another doubling or tripling of its economy before it truly embraces LNG for electric power and heat the way Japan does. In the mean time, coal is king.

As far as global climate change is concerned, it must be remembered that right now the world produces about 1 billion tons of steel per year, which requires roughly 1 billion tons of coking coal a year in order to mill the steel. If the world needed to use renewable wood to mill that steel, it would take about three Alaska’s worth of timber to do it sustainably. So the idea that the whole world is going to reduce its use of coal anytime soon is difficult to imagine considering the world’s need for steel. Alaska by itself probably has 5 trillion tons of coal on the North Slope which can be mined and delivered at a reasonable cost. Therefore, it makes it hard for LNG to compete with coal since China or Asia will have to pay a lot more per energy equivalent for natural gas then what they pay for coal, especially when LNG prices are so high.

Even if LNG demand increases along a business as usual path, there still looks to be tremendous supplies of LNG available on the Pac Rim from Kitimat, Canada, as well as Australia, Russia, the U.S. Gulf of Mexico, through the Panama Canal, and even Eastern China as conventional and unconventional shale natural gas supplies are found. What this says, is that relatively cheap LNG supplies will soon be available on the Pac Rim making Alaskan LNG less competitive. Plus there are export permitting risks. Since there was recently a contract for LNG at Chenier for $6 per MCF on the water in the Gulf of Mexico, then that suggests Alaskan LNG won’t be able to get much more than $8 or $9 per MCF at port side in the long term. However, even more relevant are Russian, Australian and Eastern Chinese supplies that could cut Pac Rim prices further. Considering the costs of an Alaskan LNG project, including a pipeline a liquefaction facility and a gas treatment plant, it will be a challenge for Alaska to get a project financed.

We must also account for Alaskan in-state demand particularly in regards to a 36 inch half BCF per day project. The idea of the small project is to leverage as much in-state demand as possible with a small LNG facility in order to make the economics of a small bore pipeline work.

3. How The Price of Oil Can Affect LNG

While the future could make exporting Alaskan LNG challenging if we only consider natural gas markets by themselves, there is still considerable upside to natural gas as oil prices start rising. One way for the world’s extensive natural gas supplies to be soaked up is if oil prices rise and natural gas (methane) is used to fuel...
compressed natural gas (CNG) vehicles. Already, the world uses natural gas liquids (propane) to fuel automobiles, but so far not natural gas. Furthermore, the price of oil has stayed high, even though many shale oil resources have come on line, suggesting that oil shale costs are not particularly low. Plus if the BRIC countries double their incomes in ten years, there may still not be enough oil for everyone and the price of oil could go up substantially. If oil reaches about $150 per barrel it may be high enough that natural gas use in automobiles will finally become cost effective and new demand for natural gas will emerge. Consider how this works.

The main hindrance to using natural gas for CNG vehicles is not the cost of natural gas (methane) or the cost of converting cars to using natural gas, rather it is the expensive fueling stations required. A large compressor able to compress methane to 3000 pounds per square inch (psi), roughly 200 bars, costs upwards of $1 million, but can only fill about one automobile every five minutes. The cost to pay for the compressor must be spread out over many car fill ups, but automobile drivers are not interested in filling up their car other than at rush hour. So because all of the traffic to fill up CNG vehicles occurs mostly during four hours per day, there must be many compressors available for that rush hour period after which they will all sit idle all day long. That creates non-performing capital asset costs when using CNG. Large high pressure tanks can be used to store CNG for rush hour use, but such large high pressure tanks are also expensive. It will therefore take a very high price of oil to make the natural gas filling stations cost effective.

This suggests that in order for natural gas prices to go up, the price of oil has to go up, which will create the incentive to switch to CNG vehicles and increase the demand for natural gas. Therefore we need to look at the supply of and demand for oil in order to understand if and when natural gas prices will increase.

![World Oil supply Forecast](image)

**Figure 2: World Oil supply Forecast**

The supply forecast for oil, as suggested in Figure 2, has expanded due to the shale oil phenomenon. However, even though there are many new shale oil plays around the world, many are concentrated in a few countries and many are not particularly liquids rich, which suggests that a more realistic view of the potential shale oil resources is that of a plateau. Looking at the new trend of oil production, a possible plateau will continue for the next 40 years. However, if world growth continues at even a modest 2% growth rate, then that implies there will not be enough oil to satiate demand assuming the oil supply forecast is correct. In that case oil prices will have to go up to the $150 range to force major oil demand destruction and the switch to natural gas. Therefore, if developing country growth continues, we should expect high oil prices in the $150 range in the next ten years even if the U.S. manages to export oil. If such a high oil price happens then it may become feasible to
use natural gas instead of oil to fuel automobiles. Then more U.S. shale gas will be needed. This bring us to the most important factor in shale gas prices, which is how gas and oil complement each other in shale production.

One of the reasons shale gas and natural gas prices in the Lower 48 have been so low these past few years, is not simply because there is more cheap shale gas. What is happening in Bakken, Marcellus and elsewhere is that shale liquids (shale oil) are being found in shale formations along with dry natural gas (methane). However, it is the valuable shale natural gas liquids (propane, ethane and pentane) that pay for the wells. The dry natural gas is then flared (burned into the air) or sold at whatever price can be had. In essence the dry natural gas is dumped on the market because the dry gas is not able to pay for the wells and drilling operations. It is only because of the valuable natural gas liquids that anyone bothers to drill in shale oil formations at all. Therefore, when a shale play is dry (has no natural gas liquids) and only produces dry natural gas and there is no liquids (oil) production to pay for the well drilling, then there is no reason to drill. That means dry natural gas only wells cannot pay for themselves unless the price of natural gas at the Henry hub goes up to $7 per MCF or so. That suggests that there is a way for natural gas prices to rise.

If oil reaches $150 per barrel, then drivers will begin to switch to CNG vehicles and the demand for natural gas will go up. Then the supply of shale gas will have to expand in order to satiate all of the expanded natural gas demand. The supply will come from a combination of wet and dry gas wells, but it will imply a need for many dry gas only wells. In that case the needed expansion of many new wells will not have the benefit of wet liquids to pay for drilling so expensive dry gas only wells will put a significant cost pressure into the natural gas price. In that case, most wellhead prices around the world will go to a $7 per MCF price, which if transportation costs are added, may cause the Pac Rim price to go up to a sustainable $15 per MCF price. Then even if Alaskan LNG needs sustainable prices of $12 to $17, the high price of dry shale gas and the large demand of CNG vehicles in the Pac Rim could make a project more feasible. The current business as usual cases suggest this will happen if there are no economic collapses and BRIC growth is sustainable and oil prices do indeed reach $150 per barrel and stay there.

4. Alaska LNG Project Risks

The risks for any Alaska project are four-fold: 1) Cost over runs of large LNG construction projects, 2) obtaining permits, especially the US's own export permit, 3) price and demand risk on the Pac Rim market should there be any collapse in markets, and 4) a rundown of up-stream natural gas supplies.

Cost overruns are a difficult construction problem with any Alaskan LNG project particularly with a buried pipeline put into permafrost. Such pipelines should be assumed to need classified gravel carried to pipeline bedding location at tremendous costs to make sure the pipeline can sustain a long life. Also labor costs, when there are work camps, can be quite substantial. Plus equipment break downs occur more easily in a harsh environment and getting repairs done can take longer to carry out then at other Lower 48 projects because of the distances involved. Therefore cost over runs can be particularly disconcerting in Alaska.

One option to reduce any LNG project costs will be the use of off-shore LNG liquefaction terminals. Such LNG liquefaction trains can be built in China or Korea and shipped to Alaska by barge and then placed just off-shore at the end of the pipeline. Then pipelines will be extended to reach the off-shore liquefaction facilities and the costs of the trains will be greatly reduced. These terminals can be located outside city and borough boundaries to reduce tax and regulation risks. Also a Gas Treatment Plant can also be built in China or Korea and barged to the North Slope at tremendous cost savings. These are the most feasible options for Alaska’s potential LNG industry and the quicker they are embraced, the more likely a solid LNG project can be established.

Permitting and political risks are also a problem. If an environmental issue emerges, such that there could be substantial delays, then that can raise costs. One interesting issue is obtaining an export permit from the U.S. DOE. While the DOE claims such a permit only costs a small fee, in fact for a project such as the Alaska’s project, it may cost $1 billion in lost opportunity. Why? Because all of the effort required in showing a need to get such a permit takes time and money. The lost time it takes to get the permit can be a substantial opportunity cost that the federal government does not take into account. For example, in order to get a permit, one has to show that there is enough supply and demand including contracts that show producers and buyers are willing to buy and sell gas. However, in order to get all those promises, it may be necessary to conduct an open season in order to obtain promises and contracts that show if there is interest. There may have to be negotiations for contracts at tremendous risk just to prove there is a need to export LNG which is required in order to obtain the
export permit. Unfortunately, no one will sign a contract to buy natural gas unless the producers are serious about
selling, but without an export license, the sellers cannot assure that a supply will exist. Thus the simple export
license itself creates a huge barrier to entry for an Alaskan LNG industry.

In addition, once there are contracts with Asia and China, there are risks that such contracts can be
negated due to politics, as Chinese’s companies could be forced to renege on their contracts. The potential for
force-major could create substantial losses.

The price in the Pac Rim will already have to be high just to assure that a large LNG project is feasible.
However, those prices could be high or low in the future, depending on the future cost of alternative gas supplies.
Competitive natural gas costs could go down, due to the substantial Pac Rim supplies coming on line, or
alternatively because there could be a large increase in demand for natural gas new potential supplies to take care
of that demand might have high costs and will keep natural gas prices steady or push them up. The amount of
feasible supply of natural gas from Russia, Western China, Australia, Canada at Kitimat, and the U.S. Gulf Coast,
means that unless natural gas is used as an automobile fuel, current natural gas supplies may inundate the Pac Rim
market and we may see contract prices go down. However, the use of natural gas for automobiles would require
that the price of oil go up into the $150 range. At that price, there may be substantial recessions or economic
turmoil around the world and the need for natural gas could decline, pushing prices back down. Therefore, the
whole natural gas market structure for the Pac Rim looks to be rather volatile and therefore a thorough risk
analysis is needed.

Also there is the risk of a faster run down of natural gas reserves from Prudhoe Bay and Point Thompson
then expected so that the current major sources of natural gas reserves are not enough to fill a pipeline. This is
especially true since much of the current natural gas reserves can be used to re-pressure oil production and bring
out the more valuable oil products. This too needs to be modeled from a petroleum engineering perspective and
added into any risk analysis.

Risk Due to the Size of Project
One of the biggest risks of any Alaska gas project stems from the fact that in order to obtain economies of
scale and low costs, a great deal of gas must be delivered to markets within a small construction time-frame or the
project quickly becomes uneconomic. That forces designs to be large. Yet, by its nature due to the need for a
large pipeline to supply all potential LNG trains, the design cannot be built up incrementally. This means any
Alaska project will be large from the start. Not only will this be one of the largest oil and gas projects ever
undertaken, it may be the biggest one-time business project ever in modern times. In fact, there have been only
two comparable projects in modern history: the gas pipeline built from Russia to Western Europe during the
Soviet era and the Trans-Alaska Pipeline System (TAPS). However, both of these projects had better returns than
an Alaska LNG project will have. This is because costs were so low for the Russian project, and because the
value of the oil was so high for the Alaska oil pipeline project.

If a corporation has one large project, then its entire earnings potential and survivability are dependent on
the success of that one project. Corporations may in fact behave like risk-averse individuals and seek a
diversified portfolio of projects. However, if one project is particularly large then it reduces the overall
diversification and increases the company’s risk. This means the corporation may in turn require a high return on
such a project. This corporate risk scenario is particularly true for any Alaskan project. The project would be on
a massive scale and revenues are extremely volatile. This means that any company that builds it faces the risk of
large losses. The three main producers may be able to reduce the risk by sharing it among themselves, but that
only reduces the risk by one-third for each company. Additionally, since the pipeline cannot be built
incrementally, but must be done all in one swoop, the producers would assume all the risk once the venture starts.

Risk Due to Downstream Price Volatility and Leveraging
U.S. Lower 48 gas prices and Pacific Rim Liquefied Natural Gas (LNG) prices have seen wide variations.
The Henry Hub natural gas price, a spot market price hub near New Orleans, went from $2 per thousand cubic
feet (MCF) to $10/MCF and back down to $2/MCF again in a single year. As this illustrates, forecasting future
prices is difficult to do. Currently the U.S. Energy Information Administration (EIA) forecasts slightly over $4
per million BTUs for the next ten to twenty years. Other private companies make similar forecasts. None of the
forecast prices use confidence intervals to determine how likely it is that gas prices will stay above or below a certain level.

One aspect of the price volatility is represented by the leveraging effect on the net-back well-head price. With a short distance between the market and the well-head, there will be a small pipeline tariff. Conversely, with a long distance between the market and the well-head, there will be a large pipeline tariff. When the market price fluctuates, it causes the net-back price to fluctuate as well since tariffs are held constant. However, the longer the pipeline, or LNG distance, the higher the tariff and the more the well-head price fluctuates in percentage terms. In other words volatility increases significantly the further away from the market the well head is. Alaska is about as far away from the Pac Rim market as you can get by pipeline compared to many other viable projects.

For example, if the price of gas for LNG in the Gulf of Mexico is $6.00 and there is a $3.00 tariff to get through the Panama Canal and into the Pac Rim, then that suggests a long run price for Alaskan LNG at $9.00 per MCF. However, if China has shale gas potential and Russia can sell its natural gas to China, the price may be much lower. One future option though is the use of CNG vehicles should oil prices continue to rise. If that happens, we can show that LNG prices could attain the $15 needed to make Alaskan LNG feasible.

Risk Due to the State’s constitution

Even though the state as an owner of the North slope oil and gas fields has the right to sell its royalty gas at whatever price it wants and to have that price automatically change as severance taxes change, nevertheless, such a contract could be construed as a tax contract and violate the Alaska constitution. Even though it is a contract to sell natural gas pure and simple, it is still a contract of the state to give and take value vis-à-vis tax changes. It may therefore be considered a de facto tax contract and therefore violate the state’s constitution in which case the risk that such a contract will be made null and void has to be taken into consideration. A better option to go around the states' constitution would be to look at article 8 where two contracts are compared side by side.

As stated above, one of the options to study consists of setting up a strategy to obtain two separate fiscal contracts: one for a potential buyer of LNG (Korea, Japan and China) and one for a potential seller of LNG (the producers). A bidding price experiment can be developed and an actual game simulation can be done to see how a bidding project would help induce maximum value for the state. If such bidding can be shown to maximize the state resource value, even with a tax contract, then it can be shown that Article 8 of the constitution can trump Article 9 and a contract may be possible. This could make an LNG project more feasible.

5. A Simple LNG Project Model

Assume there is a long run contact to sell LNG on the Pacific Rim but that the contract specifies that the final purchasing price will change as other oil or gas markets prices change. In other words the contracted price will still have some price volatility. Let us model the prices and tariffs along the supply chain from Alaska’s North Slope to Japan, which are shown in Figure 3. The prices along the LNG train are shown in dollars per thousand cubic feet ($/MCF). Note that $/MCF \approx $/GJ \approx $/mmBtu, where GJ = giga joule, Btu = British thermal unit, mm = million, m = thousand, and mmBtu = million British thermal units.
What figure 3 shows is that the LNG port price of natural gas in Japan is modeled as $12 per MCF, the price of natural gas at the Alaska port is modeled at $9 per mcf before liquefaction so that there is a roughly $3 per MCF tariff from Alaska to Japan and then again a roughly $3 tariff from the North Slope of Alaska to the South shore. The price at the wellhead is therefore $6 per MCF. The total tariff is modeled as $6 per mcf. Such a high tariff can create substantial well head risk. If the Japanese price is high at say $18/MCF, then the wellhead value is a lucrative $12 per mcf. In that case, the project is quite profitable.

However, if the price in Japan is low at say $9 per mcf, then the wellhead price is $3/MCF. If the cost of obtaining gas at the wellhead is $4 per MCF including the opportunity cost of reduced oil production, due to less pressure maintenance, then it is possible to lose money on natural gas development. So at a low price in Japan there are losses, at a high price there is high returns. However, if after a contract is negotiated, there are risks of cost overruns, risks of losses of oil production due to a loss of natural gas for wellhead pressure maintenance and a risk that the long run price and demand will not hold up, then the entire project is at risk. Then on top of all this, there are tax risks. The reason the tax change risk is so difficult to deal with is because even if all the parties involved believe that an Alaskan LNG export project is lucrative, the oil and gas producers may still not want to undertake the project, because the profits can be taxed away.

For example assume the cost of natural gas production is $4/MCF due to Alaska’s high costs. When the price in Japan is high say $18/mcf then the wellhead price is $12 and there is a profit of $8 per mcf much of which will be taxed. If the final tax rate is say 80%, then the final profit is $1.50/mcf. However, if the Japanese price is allowed to go down to $9 per mcf then the wellhead gas is $3 per mcf and there is a loss. If there is a 50% chance of gain and of loss, the expected net result is $0.50/ mcf which is very little gain to undertake a $60 billion project. One way to make the expected gain better, is to reduce the tax rate when natural gas prices are high and to give tax incentives when natural gas prices are low. However, in order to guarantee that such an incentive will last over the expected 50 year life of the project, the state of Alaska would have to have a contract for taxes. So
because of the risks involved and the fact that those risks could stop a project then Alaska needs to create a tax contract. Such a contract could substantially mitigate these risk factors in order to get a project going and where the state of Alaska would receive substantial benefits of jobs during construction, greater state revenue and a new natural gas industry. So one way to make sure that such a project will come to fruition is to reduce risks and one way to do that is to create a tax contract in order to assure that tax rates will not change during the life of the project. This is often termed fiscal stability.

However, the state's constitution, specifically Article 9, Section 1 explicates that such a tax contract is not allowed to be undertaken by the state of Alaska. Article 9 of the constitution specifies that there can be no way to stop any legislature from changing taxes and no way to make a tax contract so there needs to be an alternative method to incentivize such an LNG project.

5. The Evolution of the Alaska Constitution

The story of Alaska's natural gas dilemma started over fifty years ago, on the lower campus of the University of Alaska Fairbanks (UAF)—although it was called the University of Alaska at the time. There sits Constitution Hall, the birthplace of Alaska and the location of Ernest Gruening’s anti-colonialism speech. In Fairbanks, Alaska in 1955, former Alaska Territorial Governor Earnest Gruening gave his rousing “Let us now end American colonialism” speech to the Alaska Constitutional Convention. The group of 55 Alaskan delegates convening at the University of Alaska was pushing for Alaska to change from a territory of, to a State in, the United States of America. The speech explained why Alaska’s economy was being strangled. Alaska was a territory at the time, which meant it had little power to change taxes, to regulate industry and to acquire the tax revenues that were collected by the government to pay for infrastructure building that could create economic development. As Gruening said:

It would be impossible in any one address, even one that assumed the length of a Senate filibuster, to list all the wrongs, disadvantages and lack of immunities that Alaska has endured in its 88 years as a territory. They constitute an incredible story. Even for these who know it, it is hard to believe. It is hard for us as Americans who long ago established our faith in American intelligence, competence, good sense, and above all in American fair play, to contemplate the story of American colonialism in Alaska.

Gruening had watched as Alaska’s territorial fishing, mining, and timber wealth left the North to enrich Lower 48 investors—people who never intended to stay in the territory or invest in its long-term viability. Not only that, but a mere 3% of total natural resource production value from the territory was allowed to be collected as taxes by the territorial government, such that there were precious little funds available to pursue greater regional economic development and infrastructure enlargement. Indeed the Kennecott copper mine, in McCarthy, Alaska, extracted $200 million worth of minerals, about $10 billion in today’s dollars, and paid virtually no taxes under territorial governance. This exasperated Gruening. No country, state or territory in the world would ever tolerate such a withdrawal of regional earnings as Alaska did without receiving some benefit from it. So Gruening and others with a similar foresight started the statehood committee in order to achieve Alaskan statehood in the hopes that locals could more directly determine their destiny, and keep Alaska’s mineral value in state hands for state needs. They not only wanted the tax revenues from fishing, timber and mining to stay inside the state so that those revenues could advance economic growth for the state, but also they wanted control of the regulation of those industries to better integrate those industries within the state. So a group of territorial residents embarked on a quest to write a new constitution.

When it was over, the Alaska constitutional conventional was celebrated for its bipartisan effort to get delegates to work together toward the good of all Alaskans, not including special interests. The framers did not take their task lightly, but visited other state’s constitutional experts to ensure the constitution was sound. Indeed many a commentator has heralded the Alaska state constitution as one of the best. But it is not perfect. Interestingly enough, the Alaska constitution is now playing a pivotal role in the future of world energy supplies because of its provisions on taxation and resource exploitation.

As we will see, though, two interesting and contradictory forces within the constitution are at play in regards to the massive Alaskan natural gas pipeline project. The first is the maximization principle. The second
is the never surrender taxation ideal. These two principles not only create tension in Alaska, but do so in almost every oil and gas producing country in the world. Therefore, it is instructive to understand Alaska’s specific constitution.

6. The First Alaskan Constitutional Principle: Maximize Value

The crux of the matter for building a natural gas pipeline is that the North Slope producers want low taxes guaranteed over the long term to reduce their price and cost overrun risk before they will ever consider building a TATC pipeline. They need “fiscal stability” in writing—fixed tax rates for 50 years, which means they want a contract to specify what taxes they will pay. Yet this action will bind future legislatures’ right to tax: a contradiction to Article 9, Section 1 of the state constitution. Alaska cannot contract away taxes. But without such a contract, the natural gas project may be delayed or cancelled, due to the huge uncertainty of loss surrounding it. Not building an economically viable pipeline just because taxes cannot be contracted away would contradict Article 8, Section 2 of the constitution requiring value maximization. That’s the Alaskan dilemma.

Alaska is already losing at least $1 billion a year in tax revenue that it could be enjoying by not starting this pipeline. The fact is constitutional clauses of Article 8 and 9 may be mutually exclusive, in which case the natural gas pipeline issues will probably find their way to Alaska’s Supreme Court, and indeed should have already long ago been adjudicated there.

Within the constitution of Alaska, two valuable ideals provide the underpinnings of Alaska’s fiscal affairs and resource management: The “maximization” principle and the “never surrender tax authority” principle. The “never surrender tax authority ideal will be looked at below, but first we will look at the maximization ideal as stated in Article 8, Section 2, which says the state should, “Provide for the utilization, development and conservation of all natural resources belonging to the state, including land and water, for the maximum benefit of its people.” This clarifies how Alaska’s natural resources should be developed so that the state and its citizens maximize their value.

The maximization ideal is sensible. After all, every country or state in the world has as its universal goal to maximize the value of its natural resources to its citizens. However, maximization may mean different things to different people even if they agree that the concept is to be emulated. To hardcore environmentalists, the maximization principle may mean never touching the land. To business investors it means using the land, usually in an environmentally sound manner, while still exploiting natural resources for the purpose of creating economic opportunities. Nevertheless, it is important.

Thus the maximization principle, so defined, means that Alaska must take full advantage of business opportunities to create jobs, state revenues and environmental quality. However, for purposes of this discussion, let us assume a narrow definition of maximization, which is to generate only the most state tax revenues as possible, while still following sensible job opportunity creation and environmental regulations. The narrower assumption of maximizing state revenue may mean slightly fewer business opportunities in general, but also greater wealth for the state’s government, and therefore indirectly for its citizens. Indeed, this is often the definition used.

7. The Second Alaskan Constitutional Principle: Never Surrender Tax Authority

The intention of the second article under review here, Article 9, Section 1, was the ideal of having flexible, non-binding taxes so that any future Legislature’s right to tax would not be taken away. The constitution states in that article, “The power of taxation shall never be surrendered. This power shall not be suspended or contracted away.” The importance of not surrendering taxation authority may not be so obvious, but the idea is that if unexpected changes occur in the states’ economy, then the government must be free to flexibly address those changes including being able to alter state taxes to meet unexpected challenges. For example the state of California is often in a fiscal bind due to its proposition 13 that limits taxes on property. Without flexible property taxes the state is constantly unable to pay for its schooling and other obligations.

The idea of not contracting away the power to tax is rooted in the territory’s salmon industry. Before statehood, most of Alaska’s fisheries were owned or controlled by outside interests, mostly in Seattle. Thus, much of Alaska’s economy was being run by outsiders, who were capturing rents, i.e. taking profits, and repatriating those profits elsewhere without regard for the needs of those who lived in Alaska. Residents of the territory were seeing massive profits leaving the state, but the territorial government was not being allowed to tax
those profits in order to create regional economic development in Alaska. This is a sore spot for all natural resource producers. To compound the issue, the territorial government’s hands were tied in regards to regulating the industry. With this in mind, the framers of the constitution did not want any future legislature ever to face that same kind of restriction on taxation again. Therefore this article allows that any future government of Alaska will always be able to assist Alaska’s economic growth and alternative industrial development with higher, or lower, taxes so that tax proceeds can be used to invest in new state infrastructure.

In the end, the constitution does rightly promote two important principles for how Alaska should be run, although in reality the never-surrender-tax-authority article is more or less just a clarification of the maximize-value article, in which case the maximize-value article should receive priority. Nevertheless, while both the maximization and the no-binding taxation principles are valuable, they may turn out to be at loggerheads with one another when it comes to a North Slope natural gas pipeline. Pipelines don’t follow politics. The conundrum is that a pipeline is so risky to build due to natural gas price volatility that can generate a loss on such a project, that a project needs fiscal stability—i.e. a contract for many years stipulating a tax rate—before such a project can be built. Yet the constitution disallows this. However, if you cannot make contracts on taxes, you may not be able to build a pipeline and therefore you may not maximize the value of Alaska’s natural gas resources. So you see, one article will have to be violated in order for the other article to be retained. They may be mutually exclusive.

Ask an Alaskan today and they’ll not hesitate to say that Article 8 trumps Article 9. Yet because of the huge costs and risks involved, it is more likely than not the case that some form of contract will end up being established. Therefore, constitutional law notwithstanding, the state must still determine what the best contract and fiscal system should be. Therein lies the dilemma. The higher oil and gas prices become, the more petroleum producing governments, like Alaska, will want a fair share of those rents, and the more vociferously they will negotiate to get them. But the fiercer negotiations become, the more governments will refuse to compensate companies for risk taking. This means that new energy projects will become delayed and new oil and gas supplies will come on line more slowly. But the slower that new oil and gas supplies come on-line, the less supplies there are and the higher oil and gas prices become, etc…And there you are back to the same place again. It is a market spiral.

8. An Alternative Alaskan Process

If Alaska allowed Japan to buy its natural gas, this could be food for Alaska. If a Japanese utility and the government of Japan are Alaskan natural gas LNG project backers, it would imply a project built entirely in Alaska, which would mean more construction jobs in Alaska although it could also mean potentially less state severance tax revenue depending on tariffs. Such an all-Alaskan route would include a 4 BCF per day liquefied natural gas (LNG) project from the North Slope to the South Shore, and then on to Japan.

Nevertheless, there is a problem. Since Japan would be a major purchaser of Alaskan natural gas, it would have the market power to demand low natural gas prices to the detriment of Alaskan value—it would have monopsony power. A monopsony is where a single buyer, Japan, forces the seller, Alaska, to sell its commodity, oil, for less. So Alaska would have to get some assurances on a competitive price from Japan in terms of a contract to buy Alaska’s gas at a Henry Hub or an oil linked price or some combination thereof. That contract might even have to include something like an escrow account that Japan would lose in the event it stops buying Alaskan natural gas at the price and quantities specified. It might even have to include an agreement for side payments to the North Slope producers for the contingency of low natural gas prices. In addition, Japan could team with China, Korea and East Asia to provide guarantees to Alaska in the form of a contract that East Asia will buy our natural gas at a specified price and quantity well into the future.

Here is how the Japan card could play out. Give all three major North Slope producers six months to come up with their best Frank Murkowski Stranded Gas-like contract for everything, including a long-term special severance tax for natural gas. This would be a contract for a 4 BCF pipeline from the North Slope to the South shore and an LNG facility. Then have Japan, with the backing not only Japan but of other East Asian governments, create a single contract for an Alaskan LNG project including a guarantee to build a natural gas pipeline from the North Slope to the South Shore, and a liquefaction plant to convert the natural gas into LNG. Include terms in the Japan contract for the price and quantity for which Japan will purchase the Alaskan LNG. Then compare the two contracts: The Alaskan North Slope producers’ fiscal tax contract versus the Japan guarantee to build an LNG project and buy LNG contract. Submit the two contracts to the Alaska State
Legislature and have state representatives decide under full public scrutiny which contract is in Alaska’s best interest. Note that these contracts should include all kinds of items such as terms for an escrow account that Japan could lose for the contingency of Japan refusing to purchase Alaskan natural gas at the price and quantity agreed to, and terms for a producer sponsored LNG project to regulate property taxes. The contracts should also specify how the LNG project would be built, who will build it, how certain levels of Alaskan employment will be guaranteed, future expandability, access to Alaskan consumers or other natural gas companies and other issues.

This competitive contract bidding process has three advantages. 1) It creates true competition. The producers will face a credible threat that they really could lose their lease value should there be a slight chance that the state would go with a Japanese project, forcing the producers to give their best contract terms to Alaska. 2) It moves the state more quickly towards a viable project. There is less chance of a long and protracted court case, if Japan actually initiates construction without Firm Transportation contracts (FTs). Nevertheless, then the North Slope producer companies would have to sell their natural gas to the Japan project or risk losing their leases. If the producers did not, a court order would induce the producers to commit natural gas to such a project and allow the building of a conditioning plant for natural gas or they would immediately lose their leases and only be compensated pending a long drawn out court case. 3) It will be more transparent than a possible closed-door negotiation that can still occur with the producers under the Palin AGIA process, and what already happened under the Frank Murkowski Stranded Gas process. A Japan option though can work because Japan can use its deep pockets to build a project without FTs assuming Japan would be willing to gamble say $10 billion on a small LNG project—a gamble Japan has shown it is willing to take—that it can get the LNG project filled with the North Slope producer companies’ natural gas.

The truly interesting thing about the Japanese option is that it can take care of all Alaskan constitutional concerns. Since it is a true competition, it proves to the Alaska Supreme Court that the absolute maximum value for Alaskan natural gas is attained, and that the resultant contract will create the best possible value for Alaska. Unlike the contract of Governor Frank Murkowski, where the contract may or may not have attained Article 8 provisions of maximizing Alaskan value, (since the contract included such a low tax, and since it certainly did violate Article 9,) this contract is assured of attaining the Article 8 provisions. But even if the Alaska Supreme Court unwisely decides that Article 9 is more important than Article 8, the Japan contract is still a viable option. The Japanese, though, not knowing which way the court would decide, would still face a credible threat to lose their contract, which would force them to make the best possible offer they could.

9. Conclusion

Looking closely at the Pacific Rim LNG market suggest that there is much opportunity for Alaska to export LNG and derive much revenue, jobs and industrial development in the natural gas industry. Alaska looks to have a fairly robust supply of natural gas, although not yet enough proven reserves for a large project, and the downstream demand for LNG looks to be robust, although new supplies are coming on-line all the time to compete. One interesting factor that will affect many LNG markets is the price of oil, where natural gas is a demand side substitute for oil and a supply side complement. Assuming the demand for oil continues to hike up, the price of oil can easily top $150 per barrel and force the world to use CNG vehicles, which would increase the demand worldwide for LNG.

A specific Alaskan LNG project then faces much risk: cost over runs, permits, price and demand risk and some upstream supply risks. One of the major risks that an Alaskan project faces is that it has to be large right from the start since a long 800 mile pipeline is necessary. Even if a slow build up of LNG trains is warranted, nevertheless if a large pipeline is built, it needs to be filled right away or risk paying for non-performing assets. A simple project model is shown to explain the price volatility risks.

Another risk is Alaska’s state fiscal system of taxes. It would be nice if an export project had a tax contract in order to assure that the values of natural gas exports were not completely taxed away. Even if the current tax rates for a project look okay, they can change in the future. This suggests that an assurance of steady taxes, called “fiscal stability,” is needed. However, the Alaskan state constitution, specifically Article 9, does not allow a tax contract. The reason for that is because Alaska was under onerous tax and regulation laws when it was a territory, and because of that, it has decided not to allow that to happen again. Another option, though, is to use article 8, the maximization principle, of the constitution in order to subsume article 9.
One idea is to get two contracts, one from the producers as a tax contract and one from potential consumers as a guarantee to build an LNG project and purchase LNG contract. This would be a purchasing contract would be from China, Japan and Korea along with a guarantee to build a pipeline, say a 36 inch pipeline. The Asian entities would guarantee to build a project without any tax change and contract to buy all LNG at an indexed price. The state would weigh the best mutually exclusive contract that would maximize value according to Article 8 and that would trump section 9 of the constitution.

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