



CANADIAN GLOBAL AFFAIRS INSTITUTE
INSTITUT CANADIEN DES AFFAIRES MONDIALES

How to Manage LNG Project Risk?

by Matthew Foss
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LNG SERIES

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Energy use continues to grow, fuelled by global economic growth, population growth, the improvement in living standards, and growth of the middle class in the developing world. According to the International Energy Agency (IEA): “Rising incomes and an extra 1.7 billion people, mostly added to urban areas in developing economies, (will) push up global energy demand by more than a quarter to 2040.”¹ These trends are here to stay and the world must seek solutions to how to affordably meet the needs of this growing population.

The growth in energy demand worldwide has strained all sources and forms of energy to keep up with this demand. Innovation has tempered the strain. Wind, solar and other renewables are the fastest growing forms of energy on a percentage growth basis, yet hydrocarbons remain the largest forms of energy supply and continue to meet most of the growth in demand.

Projections are for natural gas to play a pivotal role over the next generation or two in reducing emissions and providing energy with lower air quality impacts in an affordable manner for the developing world. The IEA has proclaimed that we are on the cusp of a golden age for natural gas.² Supermajor energy companies, having recognized this, are increasing their focus on the global gas trade.³ Canadian governments have a role to play in furthering the development of Canadian natural gas to international markets through advancing overseas marketing and enabling policies and legislation to keep Canadian infrastructure projects internationally competitive.

International LNG Markets

The International Gas Union (IGU) reports that the global liquefied natural gas trade set a record in 2018 for the fifth consecutive year, reaching 316.5 million tonnes.⁴ This market continues to increase, with LNG being the fastest growing portion of this as growth markets are not well connected to supply basins by land.

The supply of LNG is diverse globally. Qatar and Australia represent almost half of the current supply.⁵ Qatar has a project in development to expand its exports. Australia is consolidating the liquefaction capacity it has already built, and has demonstrated how quickly a country can become a major player in the LNG market. Australia went from roughly 20 million tonnes per year of LNG exports to nearly 70 million tonnes per year and to holding the world’s largest amount of liquefaction capacity over the past 10 years.⁶ The United States is becoming a much more prominent supplier, with several projects under construction that would make the U.S. the third

¹ International Energy Agency (IEA) World Energy Outlook, Executive Summary, 1.

² IEA can be found at <https://www.iea.org/geo/goldenrules/>

³ S&P Global Platts analysis: “Majors Trim Oil Exposure in Shift to Gas.” Available at <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/030918-analysis-majors-trim-oil-exposure-in-shift-to-gas>

⁴ International Gas Union (IGU) World LNG report – 2019 Edition, 4.

⁵ IGU World LNG Report – 2019 Edition.

⁶ Government of Australia, Department of Industry, Innovation and Science, *Resources and Energy Quarterly*, March 2019.



largest player. Further proposed projects could make the U.S. the largest exporter within the next decade. Russia and Mozambique also represent areas with significant developments.

The major consumption areas for LNG are currently in East and South Asia and this is expected to continue. The traditional LNG markets of Japan and South Korea are the largest and third largest importers of LNG. China and India, the second and fourth largest importers, are expected to experience some of the largest increases over the coming years.⁷ A recent McKinsey and Company report forecasts that China is likely to have the most growth in LNG imports with other Southeast Asian nations forecast to represent the next largest source of LNG demand over the next 20 years. Most of this demand growth is forecast to come from electric power generation and industrial demand, particularly for plastic manufacturing and other chemicals.⁸ In both of these applications, LNG will be forced to compete for market share. In the power generation sector, natural gas is both competing with renewables such as wind and solar power to satisfy growing power needs and displacing coal as a fuel. The case for natural gas in these countries is compelling. Their economies are rapidly growing, with a burgeoning middle class seeking increased consumer comforts and requiring energy to satisfy this demand. Additionally, air quality both from coal-fuelled power generation and the use of transportation fuels is a major concern, as can be attested to by anyone who has ever visited these countries or seen pictures of the locals garbed in masks to filter the air they breathe. However, this demand will be fickle and will require that natural gas remains cost-competitive with coal.

LNG in Canada

Canada has no operating liquefaction terminals; yet, according to the IGU, we have the second largest amount of proposed liquefaction capacity next to the U.S. Some of this interest has fallen away with decisions by at least three of the project proponents not to proceed with their projects at this time.⁹

Despite this, Canadians should be very interested in the successful development of LNG for two key reasons: improved global environmental outcomes and the economic benefits to Canada. Natural gas is widely viewed as environmentally helpful, as a substitute for coal. “Natural gas is one of the mainstays of global energy: worldwide consumption is rising rapidly and in 2018 gas accounted for almost half of the growth in total global energy demand. Gas plays many different roles in the energy sector and, where it replaces more polluting fuels, it also reduces air pollution and limits emissions of carbon dioxide,” the IEA says.¹⁰ The agency has identified that natural gas reduces emissions by 50 per cent relative to coal for power generation, even when methane emissions are considered.¹¹

⁷ IGU

⁸ McKinsey and Company, Global Gas and LNG Outlook to 2035.

⁹ BC Oil and Gas Commission. Available at <https://www.bcogc.ca/public-zone/major-projects-centre/list>

¹⁰ IEA, “The Role of Gas in Today’s Energy Transitions,” 2019, 2.

¹¹ Ibid.



The development of natural gas represents significant economic benefits. Several studies have been undertaken on how much value LNG on Canada's West Coast would add to the country's economy. Each study suggests a massive impact, as should be expected from a multibillion-dollar investment. Many of the economic benefits, perhaps 70 to 75 per cent, would occur in B.C.; however, all of Canada would experience benefits. LNG exports are expected to add over \$7 billion per year to Canada's economy and an average of 65,000 jobs.¹² Jobs associated with natural gas extraction tend to be high-paying ones that add value to Canada's economy. Estimates are that these jobs pay about three times the national average and offer nine times more value to the economy than the average job.¹³ It is not surprising that an investment that is roughly twice the size of all of the investment that goes into manufacturing in Canada in a given year would be so impactful.

LNG export facilities appear to be in Canada's interest. They offer clear global environmental benefits, and clear financial and economic benefits to Canada. There have been many proposed projects; however, only one project has made a definite commitment to proceed. LNG Canada announced a final investment decision on Oct. 1, 2018 for its roughly \$40-billion project to export 26 million tonnes per year, or roughly 3.5 billion cubic feet per day. The project is a joint venture partnership between Shell, Petronas, PetroChina, Mitsubishi Corporation and KOGAS.

LNG Project Risks

An LNG facility faces many risks. The IGU identifies the following risks to an LNG project:¹⁴

¹² Allison Robins, Prince Owusu, Dan Munro and Len Coad., *A Changing Tide: British Columbia's Emerging LNG Industry*, (Ottawa: The Conference Board of Canada, 2016).

¹³ Trevor Tombe, "Better Off Dead: 'Value Added' in Economic Policy Debates," University of Calgary School of Public Policy, March 2015.

¹⁴ IGU World LNG report – 2019 Edition, 42.



Table 4.1: Liquefaction Project Development Risks

Risk Factors	Impact on LNG Project Development
Project Economics	Long-term sales contracts that allow for a sufficient return typically underpin the financing of LNG projects. High project costs or changing market prices can have a large impact on when or if a project is sanctioned, and cost overruns post-FID can impact project returns.
Politics & Geopolitics	Permitting may be time consuming. National or local governments may not be supportive of exports and could levy additional taxes on LNG projects or establish stringent local content requirements. Political instability or sanctions could inhibit project development or operations.
Regulatory Approvals	Regulatory approval may be costly and extends to the approval of upstream development and pipeline construction. Local environmental opposition, including from indigenous groups, may also arise.
Partner Priorities	Not all partners are equally committed to a project and face different constraints depending on their respective portfolios. Ensuring alignment in advance of an FID may be difficult.
Ability to Execute	Partners must have the technical, operational, financial, and logistical capabilities to fully execute a project. Certain complex projects may present additional technical hurdles that could impact project feasibility.
Business Cycle	Larger economic trends (e.g. declining oil prices, economic downturns) could limit project developers' ability or willingness to move forward on a project.
Feedstock Availability	The overall availability of gas to supply an LNG project may be limited by technical characteristics of the associated fields or the requirement of long-distance pipelines.
Fuel Competition	Interest in a project may wane if project developers or end-markets instead seek to develop or consume pipeline gas or competing fuels, including coal, oil, or renewables.
Domestic Gas Needs	Markets with high or rising gas demand may choose to use gas domestically rather than for exports. This often results in new or existing liquefaction projects being required to dedicate a share of production to meet domestic demand. In some cases, it may also limit the life of existing projects.
Marketing/Contracting	Project developers generally need to secure long-term LNG buyers for a large portion of project capacity before sanctioning a project. Evolving or uncertain market dynamics may make this task more difficult.

Some of these are clearly business risks that the developers should manage. Some risks are more related to the social context and require at least some government involvement. A third category involves those that benefit from a partnership approach between industry and government.

Domestic, Community and Design Risks

Managing the design, development and construction of a liquefaction terminal is clearly best left to the companies that will operate the facility within guidelines established by professional regulatory bodies to ensure the health, safety and environmental outcomes that Canadians expect. Similarly, co-ordinating across partners, managing the availability of natural gas feedstocks and the timing of when to proceed within the business cycle are best left to the developers to co-ordinate.



Risks associated with the processes for regulatory permitting and social acceptance of projects start to swing into areas that are joint responsibilities between the developer, Canadians and the governments that represent us. The current approach in Canada, where governments leave most of the work of building community support on major projects to the proponents, creates significant delays and may end up stalling or frustrating projects to the point that they ultimately do not proceed. The Crown has a duty to consult for projects that may impact Indigenous rights and often, project proponents are relied upon to conduct a substantial portion of this obligation. For projects with clear social, environmental and economic benefits, a different balance may be in the interest of all Canadians. There is currently a clear societal polarization fuelled by equally unrealistic expectations of status quo continuing development and immediate cessation of hydrocarbon use. Responsible government has a role to play in mediating this debate with an informed approach. This is not to suggest that governments should go so far as to take on the role of being project proponents. However, there is significant room in the current approach to be more active in defining clearer requirements in the regulatory permitting arena and also in providing clearer statements of the public interest. One thing I learned in the years that I spent in government was the difficult time that project proponents had with moving targets of what would be required for a project to be considered acceptable. Some argue that a signal of a well-functioning regulator is for some projects to be denied. The argument behind this type of sentiment is valid although the argument itself is ridiculous. Project proponents do not invest millions in project design unless they believe the project is aligned with Canadians' expectations. The clearer our expectations, the more likely we are to have only the types of projects that we want being proposed.

Another failing within the regulatory and social acceptance of projects involves the distribution of project benefits. Often, projects were delayed by negotiations with small groups of stakeholders over the share of project benefits that they would be provided or earn. Frequently, the challenge in these negotiations is a misunderstanding of the value available to be shared. These negotiations may be better served by having some form of an independent and impartial third party adjudicate to ensure that all parties are treated fairly.

International Negotiation Risks

At this stage, most of the LNG project proposals have secured many of the required regulatory permits and have advanced along portions of the project design phase. The challenge for many of the projects is now in securing a market so that detailed engineering design can be built. This is an area that would also benefit from a joint effort between project proponents and governments. Canadian governments should actively participate in the negotiations with the clear intent of providing clarity and stability of the rules that a project will operate under for its initial contracts. Governments should also guarantee the process's integrity and timeliness of the required infrastructure for these projects.



On the surface, the reasons for government involvement relate to the fact that these projects have markets overseas, particularly with countries that have less separation between industry and government. Canadians are very unfamiliar with this. Most of our trade has traditionally been with the United States and in western Europe with similar legal principles and institutions. Our evolving trade into new markets challenges the way we have done business. Even democratic countries such as Japan and South Korea, with largely free-market principles, are used to having governments and business co-operate, particularly in international endeavours and those that represent critical elements of the economy such as energy supplies. Buyers from these countries are used to having governments involved in the negotiations to ensure the host countries' full co-operation and support. It is quite reasonable for these international buyers to want some degree of security in organizing a 10- or more year deal in a foreign country. The buyers need a clear understanding of the rules that the foreign government would impose and at the very least, some assurance that the government would maintain an enabling business climate for the deal. Canadian companies need their governments involved in securing trade deals and providing support for the terms of the trade discussions. The alternative is to rely solely on major multinational companies with interests around the world to negotiate these deals, using their international business savvy and global portfolios to manage the risks. Relying on multinational companies to manage this risk ultimately shifts benefits over the life of a major project away from Canada, since these companies use their international portfolios as opposed to strictly a local approach to manage risks.

Long-Term Market Risks

The world remains in a state of change. Trade patterns are evolving and so are the energy sources that fuel our economies. There is tension between energy efficiency, fuel costs and supply sources. Predicting the precise success of a particular region or industry is impossible, as history has often taught us. Just when we think there is only one possible outcome, we are surprised at what happens. Take the fall in the price of oil in 2014 when people believed that high oil prices were here to stay. Here we are, five years later, with oil prices that are still well below what anyone would have predicted in 2013. A technological shift that made it economical to extract oil from shale formations has had a profound impact. What does the future hold for shifts in the energy spectrum as battery technologies make renewable power more flexible? Similarly, can we truly dismiss the possibility of a technological transformation that reduces the impact of coal consumption? Multibillion-dollar projects such as LNG that require many years to recover their investment remain risky ventures.

Beyond the role of state-to-state discussions for a major energy project, there is a role for Canadians to take on a more explicit share of the market risk, given the value that LNG brings to Canada. Much of the value arises from the development and production of Canadian natural gas resources. However, the transportation and processing of the gas represent much of the cost and therefore much of the risk. Estimates suggest that the costs of Canadian LNG are about 29 per cent for the natural gas, seven per cent for the pipeline to the coast, 50 per cent for the liquefaction



terminal and 14 per cent for the shipping.¹⁵ Almost three quarters of the cost is in transportation. This should make everyone nervous to an extent as it leaves room for competition from other suppliers (Alaska, Russian pipeline gas, Russian Arctic gas), that may have a locational advantage to undercut the delivered price. While other supplies with this geographical advantage do not appear to be poised to out compete Canada in the global LNG market, this can never be ruled out completely. Western Canada learned this after losing much of its market in the U.S. Midwest and northeast to production from Pennsylvania. Less than 20 years ago, it was unfathomable to consider that western Canada would not be able to sell all of the gas it wanted to into the United States and now we are all but displaced from the U.S. market.

Project proponents will try to manage this risk of losing market share to other supplies over the duration of operation through long-term contracts. However, the North American experience of the 1970s and 1980s demonstrates how fragile these contracts can ultimately be. Natural gas demand increased rapidly as a preferred fuel for heating and power as the economies of Canada and the U.S. boomed in the post-Second World War era. Natural gas was seen as a competitively priced alternative to oil in space heating, with superior air quality results to coal in power generation. Natural gas demand was expected to continue to grow unabated. Widespread challenges with price regulations and resulting supply interruptions had created supply security concerns by the mid-1970s. The U.S. Congress passed the *Natural Gas Policy Act* in 1978, which changed how prices were regulated, restricted some natural gas uses and ultimately sowed the seeds of years of demand decreases. Most natural gas in North America was sold to pipeline companies under long-term contracts that were 20-25 years in length. These contracts typically contained provisions known as “take or pay” that required the pipeline and distribution companies to pay for the natural gas that they had contracted for regardless of whether they could resell it to consumers, including power plants, factories and homeowners. This was thought to be needed to secure the supply and to facilitate the upstream industry. Demand declined as prices rose to support new supply. Utilities were caught with significant financial challenges as these take-or-pay provisions required them to continue to pay for gas that they were unable to resell. The result was a forced renegotiation of these contracts to avoid bankruptcy and defaults that would have been the ultimate outcome if the take-or-pay provisions were maintained.

The history of take-or-pay contracts in North America has demonstrated that they are not sufficient to manage long-term risks. “Experience would suggest that take-or-pay does not protect the seller against the risk of a structural change in the industry.”¹⁶ This is a particularly important consideration with international transactions. How do you enforce contractual terms across international boundaries with parties that may be subject to significant market changes? The only real protection for this is for all members of the value chain including producers, pipeline companies, liquefaction terminal owners, shipping companies, regasification companies and distribution companies to manage their businesses under the constant pressure of maintaining a

¹⁵ Claudio Steuer, “Outlook for Competitive LNG Supply,” Oxford Institute for Energy Studies, March 2019.

¹⁶ National Energy Board, “Natural Gas Market Assessment,” *Long-Term Canadian Natural Gas Contracts Update*, 1997, 23.



value proposition for the end users. Canadian producers and liquefaction owners must maintain a competitive product offering over the life of a major infrastructure project.

Government can help manage the risk associated with structural market changes by assisting developers with the costs of the liquefaction facilities. The simplest and least costly way is for governments to defer taxes on the project through accelerated depreciation rates that help developers pay off other debts sooner. Canadian governments have used this for many industries. LNG facilities were provided with an accelerated depreciation rate of 30 per cent per year announced in 2015.¹⁷ This is an improvement over the previous rules that provided an eight-per-cent depreciation rate. An eight-per-cent depreciation rate requires roughly 27 years to write off 90 per cent of the original expenditure. Increasing the depreciation rate to 30 per cent shortens this period by 20 years. However, it is important to note that this accelerated depreciation is only eligible against income from the LNG facility. Any years spent operating the facility at a loss would postpone the write-off of these expenses. This feature would be particularly useful if the liquefaction facility costs were allowed to be used against current upstream incomes. Additionally, there is room for an increased depreciation rate. The U.S. government, a key competitor in the LNG industry, allows for a full write-off or expensing of these costs in the year they occur. The Canadian government introduced a similar provision to allow machinery and equipment used in manufacturing to be fully expensed in the year of acquisition in the fall update to the 2018 budget.¹⁸ Paying down the debt quickly allows for greater flexibility in maintaining competitive pricing for natural gas as market conditions evolve.

Conclusion

Canadian governments should take an active role in both establishing and securing international buyers for Canadian LNG and in ensuring LNG's long-term competitiveness through enabling policies and legislation. Governments may even wish to consider specific tax agreements with LNG facilities that accelerate the paydown of facility costs to ensure the greatest flexibility is available at times when these facilities may face increased competition. Such provisions would shift the risk profile but not the overall share of expected benefits to Canadians.

¹⁷ Available at <https://www.canada.ca/en/news/archive/2015/02/accelerated-capital-cost-allowance-liquefied-natural-gas.html>

¹⁸ Available at <https://budget.gc.ca/fes-eea/2018/docs/statement-enonce/chap03-en.html#s2>

► About the Author

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The Institute was created to bridge the gap between what Canadians need to know about Canadian international activities and what they do know. Historically Canadians have tended to look abroad out of a search for markets because Canada depends heavily on foreign trade. In the modern post-Cold War world, however, global security and stability have become the bedrocks of global commerce and the free movement of people, goods and ideas across international boundaries. Canada has striven to open the world since the 1930s and was a driving factor behind the adoption of the main structures which underpin globalization such as the International Monetary Fund, the World Bank, the World Trade Organization and emerging free trade networks connecting dozens of international economies. The Canadian Global Affairs Institute recognizes Canada's contribution to a globalized world and aims to inform Canadians about Canada's role in that process and the connection between globalization and security.

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