

LNG

British Columbia's Liquefied Natural Gas Strategy

One year update



Ministry of
Energy, Mines
and Natural Gas



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courtesy of Nexen

Message from the Premier

THE BC JOBS PLAN IS MY GOVERNMENT'S MAP to a prosperous future full of new economic opportunity.

In the 12 months since we released our Liquefied Natural Gas Strategy, we have made significant progress. From my work with overseas investors, I know first-hand that the demand for LNG in Asian markets is strong, and there's significant opportunity for our province to benefit from entering this new market. All signs are currently pointing to British Columbia taking its place among the global leaders in natural gas production and export.

We will seize this opportunity by moving without delay, and we will not waver from our commitment to a sector that is built according to clear, strong and rigorous environmental standards.

The current expectations for LNG growth in British Columbia show the industry could add as much as \$1 trillion in cumulative gross domestic product between now and the year 2046. That is new money that represents the promise of a lasting legacy that includes tens of thousands of stable jobs for British Columbians.

We are continuing our close work with industry and First Nations to build the world's cleanest LNG industry. And we are supporting this unprecedented opportunity for growth with bold actions that ensure British Columbians are equipped with the skills necessary to secure new jobs.

Together, we have made monumental progress – proof that we can achieve our goals of job creation, new economic opportunities and investment that build a prosperous economic future for British Columbia.



*Honourable Christy Clark
Premier of British Columbia*

Message from the Minister



*Honourable Rich Coleman
Minister of Energy, Mines and Natural Gas
and Minister Responsible for Housing*

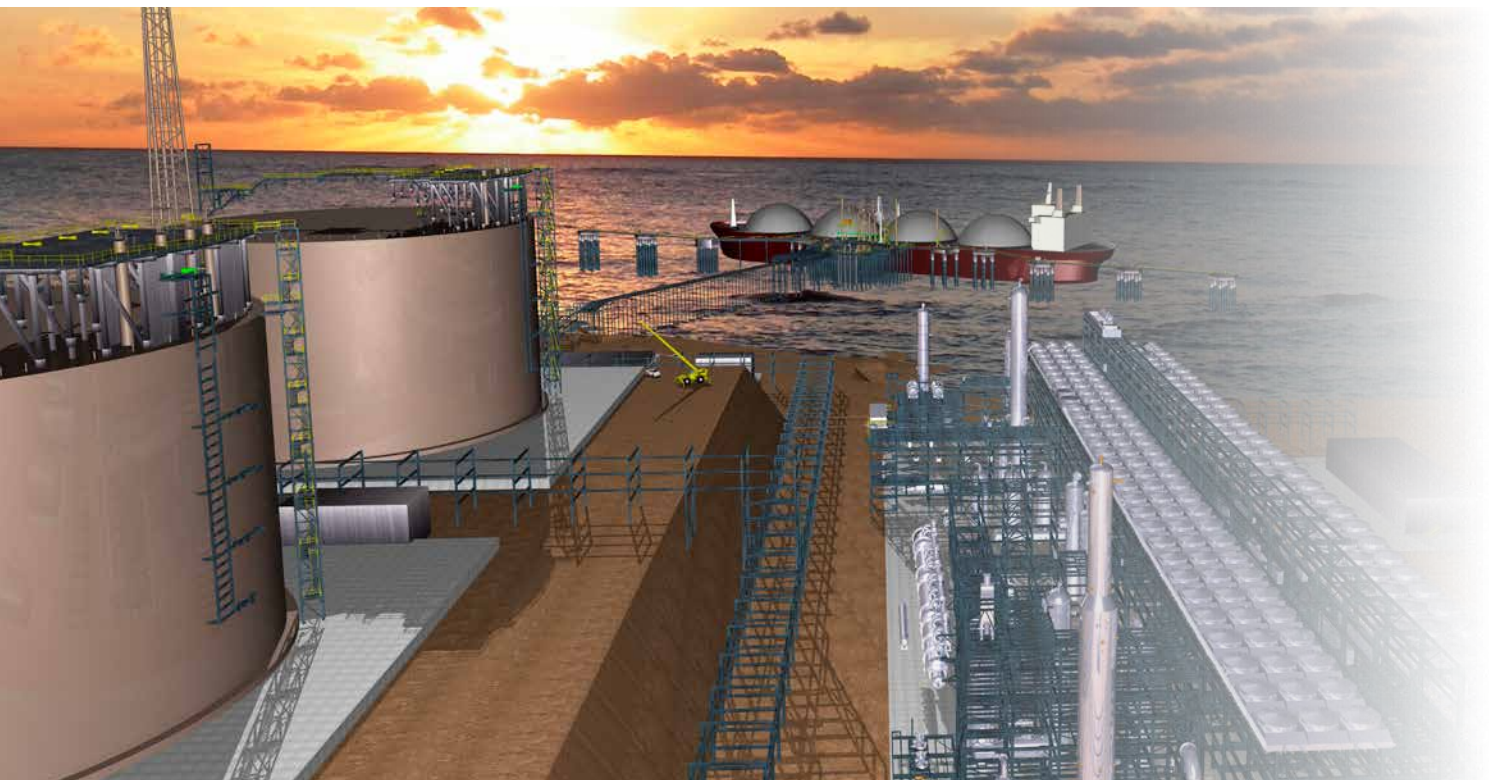
OUR GOVERNMENT'S ASPIRATIONS TO BUILD a liquefied natural gas export industry are quickly taking shape with steady, concentrated action to ensure British Columbia is ready to compete on a global scale.

Significant action has been taken, including policy changes to foster growth and to ensure power is available to support development.

We've seen concrete action from investors. Prospective trade partners have taken notice of our plans and large industry players with global LNG experience have come forward with major project proposals. Our province is already experiencing benefits as industry invests time and capital towards natural gas production and export infrastructure.

More work needs to be done, but our government remains steadfast with its goal to deliver a LNG future we can all be proud of. In addition to our high environmental standards, we have access to renewable energy supplies and the best technology to build a cleaner tomorrow.

This is an exciting time for British Columbia. A new industry with the ability to add unprecedented economic growth and well-paying jobs is on our doorstep. We are championing its development and British Columbians will benefit for generations to come.



Courtesy of Apache Canada

Our vision for the future – one year ago

JUST A SHORT YEAR AGO OUR GOVERNMENT released a bold new vision and strategy to build a new industry – one which will dramatically increase the market potential of British Columbia's abundant supply of natural gas, and establish a lasting legacy for our people.

The vision is grounded in the global promise of Liquefied Natural Gas (LNG) – a technologically advanced process that cools natural gas to -160 degrees Celsius to create the world's cleanest burning fossil fuel – an environmentally friendly commodity that can be safely transported over long distances.

B.C.'s vision for LNG began to take focus in September 2011 with the release of *Canada Starts Here: The BC Jobs Plan*. This plan set the stage for economic growth by focusing on our province's competitive advantages, including natural resources and proximity to growing markets in Asia.

The BC Jobs Plan included a very ambitious target: three LNG facilities in operation by the year 2020.

Today, one year later, the progress we have made affirms British Columbia's commitment to this target.





Courtesy of Apache Canada

Why is LNG important?

B.C. has supplied the North American market with natural gas for more than 50 years. Over that time, the market has changed drastically with the onset of unconventional natural gas and supply.

In just a few short years, North America's access to natural gas has increased 10-fold due to new supply, diminishing the demand and commodity value of B.C.'s most promising resource.

Globally, the situation is much different. The demand for energy is increasing dramatically, particularly in Asia where economies are searching for natural gas to support massive industrial modernization and the diversification of their energy portfolios.

Facts about global LNG:

- * LNG is natural gas which has been cooled to -160 degrees Celsius to keep it in a liquid form.
- * It is non-toxic, odourless, non-corrosive and less dense than water. It is a stable, low risk fuel. If it spills, LNG will warm, rise and dissipate into the atmosphere.
- * LNG, unlike natural gas in a gaseous form, can be shipped overseas and has been safely transported around the world for 50 years.
- * Between 2000 and 2009, the volume of LNG traded, on an annual basis, increased by 77.3 percent.
- * The largest demand growth potential moving forward exists in the Asia Pacific market, specifically in Japan and South Korea. China and India are also competing for additional natural gas supply.

Our government is working hard to fill that gap by transforming British Columbia from a natural gas-producer with an overabundance of supply to a global supplier of the world's cleanest burning fossil fuel.

With our LNG strategy now in motion, British Columbia's natural gas sector is repositioning itself to continue to prosper and create strong communities and more well-paying jobs for our families.

Our vision – year one

MONUMENTAL PROGRESS HAS BEEN MADE IN ONLY ONE YEAR.

The BC Jobs Plan's goal of three LNG facilities by 2020 is on track. We're even seeing strong signs that we could surpass that target.

Since British Columbia's LNG Strategy was first introduced, Premier Christy Clark has led two trade missions to Asia to promote trade and cultivate business relationships with prospective customers. These missions were a crucial first step towards establishing B.C. as a preferred location for LNG investment.

On the first trade mission, several Canadian energy companies joined the mission to China and laid out B.C.'s attractive position as a future supplier of natural gas. On the second mission, the Premier visited Japan and Korea – the world's largest importers of LNG – to raise the profile of B.C.'s natural gas prospects and ambitions for growth and development.

Since last year, over \$6 billion dollars in investments have been made to acquire upstream natural gas assets and execute strategic corporate acquisitions, including joint ventures that will anchor the development of pipelines and LNG plants in B.C. In addition, government estimates up to \$1 billion dollars has been spent to prepare for the construction of LNG infrastructure.

Following Premier Clark's second trade mission, one of the largest natural gas players in the world, Shell, announced plans to build LNG Canada with joint venture partners KOGAS, Mitsubishi and PetroChina. TransCanada was later selected to build supportive pipeline infrastructure.

As well, the BG Group, a major company with an established LNG portfolio, announced a partnership with Spectra Energy to jointly develop a new transportation system. The proposed pipeline will move natural gas from B.C.'s northeast and will serve the BG Group's planned LNG facility on Ridley Island in the Port of Prince Rupert.

More recently, PETRONAS, an experienced LNG operator, announced the Pacific Northwest LNG facility along with their acquired partnership of Progress Energy. TransCanada has been chosen to build supportive pipeline infrastructure for this plant also.

Late last year, Chevron Canada purchased operating interest in the Kitimat LNG plant and the Pacific Trail Pipeline. Chevron will now build and operate this project along with Apache.

In addition to these LNG proposals, there are other industry players who are actively looking into the possibility of projects of their own, including a partnership between Nexen (recently acquired by CNOC Limited) and Inpex; as well as a new deal between AltaGas and Idemitsu Kosan.

"Our natural gas sector needs LNG export development, and so does our entire province, if we are to have a sustainable, prosperous future for all British Columbians."

Greg D'Avignon, President and Chief Executive Officer of
the Business Council of British Columbia



Courtesy of Nexen

Current LNG proposals in B.C.

PROJECT NAME	PROPONENT	LOCATION	PROJECT STATUS
BC LNG Douglas Channel	Tatham Family, Texas	Kitimat	<ul style="list-style-type: none"> ■ Contacts signed to sell LNG to Asia customers
Kitimat LNG	Chevron Canada, Apache Corp,	Bish Cove, Kitimat	<ul style="list-style-type: none"> ■ Completing front-end engineering and design (FEED), with early site work in progress
LNG Canada	Shell, PCL, KOGAS, Mitsubishi , PetroChina	Kitimat	<ul style="list-style-type: none"> ■ In FEED ■ 25-year export licence approved ■ TransCanada chosen to build pipeline
BG Group	British Gas Group	Ridley Island, Port of Prince Rupert	<ul style="list-style-type: none"> ■ Development agreement with Spectra Energy for a pipeline
TBD	Nexen, Inpex, JGC	B.C.'s North Coast	<ul style="list-style-type: none"> ■ Active development
Pacific Northwest LNG	PETRONAS, Progress Energy	Lelu Island, Port of Prince Rupert	<ul style="list-style-type: none"> ■ Filing of the project description with regulators for environmental assessment expected in 2013

Some of the world’s largest LNG players have come forward in just one year to help breathe life into B.C.’s vision for LNG. This is proof positive that our efforts to develop a LNG industry are working, and will deliver tangible results.

LNG proponents are already taking steps to secure customers for their projects, invest in pipelines, and engage with stakeholders including First Nations and local communities to capitalize on our shared vision.

Progress on priorities

TO ACHIEVE OUR GOAL OF THREE LNG FACILITIES by 2020, we developed a strategy with three key priorities.

1. Keep B.C. competitive in the global LNG market
2. Maintain B.C.'s leadership on climate change and clean energy
3. Keep energy rates affordable for families, communities and industry

In just one year we've made significant progress on all three priorities thanks to hard work, determination and teamwork across the provincial government, BC Hydro, the BC Oil and Gas commission, and much further afield.

1. Keep B.C. competitive in the global LNG market

British Columbia's economy relies on trade and investment to support economic growth and job creation. That is why our government is focused on establishing the foundation necessary for a successful LNG industry by bringing all the key players to the table.

In February 2013, the Province will host Canada's first international LNG conference. The theme, *Fuelling the Future: Global Opportunities for LNG in BC*, will highlight B.C.'s emerging role as an energy powerhouse that will serve Asia Pacific markets with a stable, long-term supply of natural gas. Global industry experts, learning institutions, training authorities, First Nations, community leaders and other stakeholders will gather in Vancouver to discuss important subject areas such as market opportunities, technology and skills development.

Preparing British Columbians for the new opportunities ahead is essential – to make sure they have the expertise to secure new, long-term jobs. As part of our commitment to LNG, the Province is undertaking a Labour Market Partnership project to assess the future needs of B.C.'s natural gas sector. In addition to government, participants include First Nations, Spectra, Apache, Petroleum Services Association, Trinidad Drilling, Energy Services BC, Shell, Petroleum Human Resource Sector Council, Canadian Energy Pipeline Association and the BC Construction Association.

Construction of these LNG projects alone is expected to create thousands of jobs over the next decade, including field preparation work, trade services, heavy-equipment operators and many engineering positions. Then, once in operation, each LNG facility will require highly-skilled and technically qualified employees to successfully manage and operate the LNG processing and shipment. As a result of this activity, production and service activities in northeast B.C. will grow exponentially, with professional opportunities in support centres such as Vancouver also increasing.



Courtesy of Nexen

“This is a new industry. This is an industry that provides, really, decades of further jobs, both on the upstream side maintaining the gas supply as well as on the LNG facility maintaining and operating that facility on the coast.”

—Michael Culbert, Progress President

Following the labour analysis, we will lead the development of a comprehensive workforce strategy and action plan, with the continued support of industry and training authorities. Within the next year, we will release this action plan so British Columbians are trained in time with the skills necessary to fill the future labour demand.

We need to encourage capital planning and investment so B.C. can enter the LNG export market as soon as possible. *British Columbia's Natural Gas Strategy: Fuelling B.C.'s Economy for the Next Decade and Beyond* guides and supports important development with a total of fifty action items to help grow and diversify B.C.'s natural gas sector.

2. Maintain B.C.'s leadership on climate change and clean energy

British Columbia is a clean energy leader for a reason. We are the first jurisdiction in North America to become carbon neutral and our carbon tax has proven to influence positive change with the reduction of province-wide greenhouse gas emissions.

This leadership guides the development of B.C.'s LNG industry. Since the release of *the BC Jobs Plan* we have been in discussions about power supply requirements with LNG proponents. Government remains committed to clean energy as part of the solution, but flexibility is required to address important business decisions that need to be made. We are confident solutions will be found and, over the next year, power-supply arrangements between industry and BC Hydro will be reached. With a commitment to clean energy, the use of the best technology, and the best climate action policies, B.C.'s LNG industry will meet new standards of environmental responsibility.

Of course, the fight against climate change is a global issue. By exporting natural gas, B.C. will supply growing markets with a cleaner energy alternative compared to higher emission sources like coal and diesel. B.C.'s natural gas is also expected to replace the use of nuclear power in other areas of the world.

If B.C. were to export two trillion cubic feet of natural gas per year, it would be the equivalent of:

- * More than 70 nuclear facilities
- * Or, approximately 100 average sized coal plants

The Province has been analysing the energy demands of other countries, and investigating the expected benefits of B.C.'s LNG exports. Our initial analysis points to significant environmental benefits as a result of a decreased use of coal-fired power generation and a greater use of natural gas in the transportation sector (instead of diesel).

In addition to being a clean energy product, natural gas is also a reliable power source and is increasingly used together with renewable power services like wind and solar. For this reason, natural gas is referred to as 'firm service' because it provides back-up power for intermittent renewable energy services.

LNG represents an unprecedented opportunity for the Province to further its clean energy leadership. We will create prosperity for future generations by providing new markets with a clean-burning fossil fuel and increasing use of renewable energy.

3. Keep energy rates affordable

Since the LNG Strategy was released last year, the Province has taken action to keep electricity rates low, protect residential ratepayers and maintain reasonable energy cost for industry so that B.C. remains an attractive place to invest and build.

It started with an important update to the Province's electricity self-sufficiency policy alongside the LNG strategy in February 2011. The policy was amended to provide BC Hydro with the flexibility to reduce rate increases by planning electricity supply against average-water availability, instead of critically-low water levels. This change supports economic development projects, like LNG, by allowing BC Hydro to plan power supply arrangements that are responsive to future needs.

In June 2012 we took another significant step by improving the Clean Energy Act to enable the use of B.C.'s natural gas for LNG production. The change provides industry with the ability to access a variety of energy services, including natural gas and renewable energy, to address LNG power demands. With this change in place, BC Hydro is in a position to provide LNG proponents with cost-competitive electricity. This assurance will encourage proponents to invest in B.C.

Since the release of *the BC Jobs Plan*, the Province and BC Hydro have been leading discussions on power-supply arrangements with each LNG proponent. BC Hydro is developing its Integrated Resource Plan which will outline B.C.'s expected growth and electricity demands over the next 20 years, including LNG needs.

Ultimately, having affordable electricity, for both residents and industry, is essential to building a competitive LNG industry.



Courtesy of TransCanada

"What we're working on is a way to create \$40-million worth of revenue coming out of these projects that could be shared amongst the northwest First Nations."

– Ellis Ross, Chief Councillor of the Haisla Nation



A legacy for British Columbians

TWELVE SHORT MONTHS AGO, WE EMBARKED ON A BOLD new path to build a lasting legacy for our families today and tomorrow. And, in that short timeframe, the foundation has been laid.

Global industry players have announced their project plans and corporate offices are now opening their doors in Vancouver. Final investment and project descriptions are pending with environmental reviews clearly on the horizon.

We are confident in our momentum, and in the growth of an LNG industry that will create thousands of new jobs for British Columbians. These jobs will exist not just in the LNG projects themselves but also in a growing list of service sector opportunities.

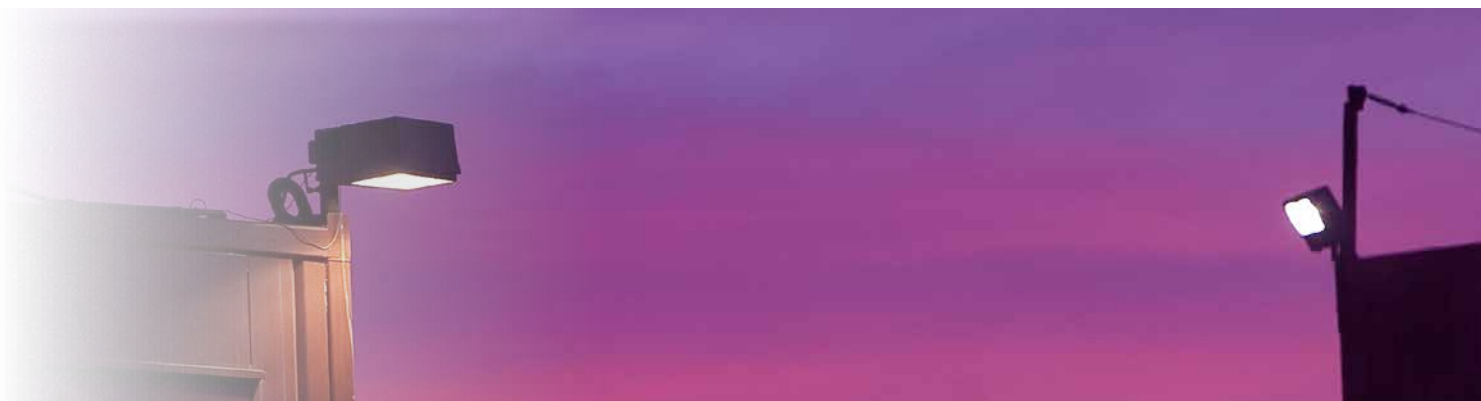
We have a vision of B.C. as a strong, prosperous and competitive economy – the economic engine of Canada. LNG is a key part of that legacy.

The market potential is clear and demand for LNG is growing. Potential is turning into commitment. And the progress in the last year has been virtually unprecedented.

Appendix

GOAL	ACTION	DETAILS
1. Keep B.C. competitive in the global LNG market	Targeting policy adjustments, investments and incentives to grow new markets in Asia, promote value-added industries, and support the development of innovative technologies.	In progress. Deputy Ministers' committee on LNG created in September 2011. The Ministry of Energy, Mines and Natural Gas leads long-term coordination. Main discussion topics: electricity supply options, climate policy, detailed negotiation action plans with proponents, upstream costs for natural gas development, regulatory oversight, permitting coordination, First Nations engagement, and labour requirements. Fifty action items outlined in B.C.'s Natural Gas Strategy guiding progress in addition to formal commitments made in LNG Strategy.
	Focusing on LNG-related job opportunities in future skills training plans.	Ongoing. A Labour Market Partnership (LMP) agreement for a BC Natural Gas Workforce Strategy and Action Plan is currently being led by the BC Resource Training Organization. Partners involved in the LMP are the Petroleum Human Resource Council, Spectra Energy, Energy Services BC, Petroleum Services Association, Canadian Association of Petroleum Producers, Kitimat LNG, Trinidad Drilling and Shell Canada. Ongoing. Implemented the Targeted Skills Shortage Program to assist small and medium-sized employers with training plan development and funding to encourage the retention and advancement of low-skilled employees. 1,200 participants in 5 growth sectors, including LNG. Ongoing. Over \$1 million invested in Employment Skills Access programs at BC public post-secondary institutions to train over 250 participants for employment in the oil and gas sectors.
	Attracting global investment.	Ongoing. \$6 billion in natural gas related commitments achieved during 2012 calendar year following successful trade missions to Asia Pacific. LNG proposals increased to five or more during the same time. Government initiatives like the Infrastructure Royalty Credit Program continues to facilitate new pipeline development and capacity needs.
	Fostering effective relationships with First Nations.	Ongoing. Agreement and new regulations negotiated under the federal First Nations Commercial and Industrial Development Act completed for Kitimat LNG facility. LNG-related economic planning underway, in addition to industrial land use planning for Kitimat and the Port of Prince Rupert.
2. Maintain B.C.'s leadership on Climate Change and Clean Energy	Promoting and supporting the use of natural gas as a transportation fuel.	In progress. In support of Ministry of Energy, Mines and Natural Gas amendments to the Clean Energy Act, the Ministry of Transportation and Infrastructure (BC MoT) has implemented special weight exemptions so that natural gas heavy-duty vehicles are not competitively disadvantaged. BC MoT continues to work with its stakeholders to support the development of a broader domestic market for LNG/CNG under the broader natural gas strategy, by encouraging industry conversion to natural gas engines. BC MoT has liaised with and is monitoring the work of the Canadian Natural Gas Vehicle Alliance, which is preparing a report regarding the adoption of LNG as a marine fuel on the west coast of Canada.
	Driving efficient federal and provincial environmental assessments.	Ongoing. B.C. submission to Canada on the thresholds in the federal Regulations Designating Physical Activities (a regulation that lays out what projects will require federal environmental assessment). Submission developed by the Environmental Assessment Office with input from other natural resource sector ministries. Meetings between B.C., Alberta, and Saskatchewan to develop proposal to Canada for updating substitution and equivalency provisions.

GOAL	ACTION	DETAILS
3. Keep Energy Rates Affordable	Planning for future power supply for LNG terminals.	Ongoing. Updated Clean Energy Act to enable the use of natural gas to power LNG plants. The change is specifically meant to help meet a large electrical demand for LNG projects moving forward. It will ensure the LNG industry can access a reliable, timely and cost-competitive mix of gas-fired and renewable generation to meet its large electrical demand. The 93 per cent clean energy target will continue to apply to non-LNG load and will ensure the majority of B.C.'s power requirements will be met with clean or renewable resources. Power supply negotiations between industry and BC Hydro are ongoing.



Courtesy of Nexen



**BC JOBS
PLAN**

