

An aerial photograph of an industrial facility, likely a liquefaction plant, situated in a snowy, forested area. The facility includes several large storage tanks, a tall distillation column, and various piping and structures. The surrounding landscape is covered in snow, and a dense forest of evergreen trees is visible in the background.

# LNG

## Liquefied Natural Gas

A Strategy for B.C.'s  
Newest Industry



**LIQUEFIED NATURAL GAS**

# Message from the Premier

**THE BC JOBS PLAN RELEASED IN SEPTEMBER** is all about leveraging our competitive advantages to benefit British Columbians. Opening new markets for our exports, strengthening infrastructure to get our goods to market, and working directly with employers and communities will all help grow and strengthen our economy – creating jobs in every region of the province.

Building on our strengths is critical. So is breaking new ground. We've always relied on natural resources to fuel our economy. Now, with liquefied natural gas (LNG), we have a rare and exciting opportunity to build a whole new industry and use its development to spur other positive changes, such as growth in our clean-energy sector.

There will be challenges along the way. That is inevitable. It goes hand-in-hand with creating something new. As a government, we are committed to working closely with communities, First Nations and other important stakeholders. We are confident that, working together, we can reach our goals – investment, job creation and new economic opportunities – while protecting the environment and building a better quality of life for future generations.

With this LNG strategy, we are taking the next steps forward to harness British Columbia's strengths for the benefit of all our citizens. It's part of our plan to increase economic prosperity, create an environment where business and investment can flourish, and show the world that Canada really does start here.



*Honourable Christy Clark  
Premier of British Columbia*

Global trade in LNG doubled between 2000 and 2010. It's expected to increase by another 50 per cent by 2020.

# Message from the Minister



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

1,000 cubic feet of natural gas costs under \$4 in North America in late 2011 – versus \$16 in Asia.

## **OVER THE NEXT 20 YEARS, GLOBAL DEMAND FOR NATURAL GAS**

is expected to rise dramatically, fuelled by rapid economic growth in Asia. With the development of LNG – a shippable form of natural gas – B.C. is ideally positioned to compete for a share of that lucrative market.

Building a B.C. LNG industry will take time. And other jurisdictions – including the U.S., Australia and Africa – are also moving to develop their LNG potential. The good news is that B.C. is ready: we've been preparing for this opportunity for nearly a decade with progressive royalty programs, infrastructure upgrades, clean energy policies, comprehensive environmental assessments, and direct engagement with industry, First Nations and communities.

We are working hard to build our overseas markets through measures such as the Premier's recent trade mission to Asia. We are working with the industry to attract new capital and foreign investment. The federal government recently approved a 20-year export licence for the LNG facility being built in Kitimat – the first such licence ever issued in Canada.

With *The BC Jobs Plan*, the Province has committed to having our first LNG plant up and running by 2015, with a total of three LNG facilities operating by 2020. These are bold targets, but I am confident British Columbia will meet them.

Developing our LNG export potential is an excellent investment in our future. It will generate thousands of jobs and billions of dollars in new investment. That will mean more revenues for government to pay for services like health care and education. Equally important, it promises long-term stability for families and communities, with well-paying jobs, diversified economies and new opportunities to build expertise in a new global industry.

# LNG Development – Our Vision for the Future

## Quick Facts About Liquefied Natural Gas

- \* LNG is natural gas, cooled to -160 degrees Celsius to keep it in a liquid form.
- \* It is non-toxic, odourless, non-corrosive and less dense than water.
- \* Compared to conventional natural gas, LNG takes up 600 times less space.
- \* Unlike conventional natural gas, it can be shipped overseas, dramatically increasing its potential markets.
- \* LNG has been safely used and transported around the world for 50 years.
- \* It is a stable, low-risk fuel.
- \* If it spills, LNG will warm, rise and dissipate into the atmosphere.

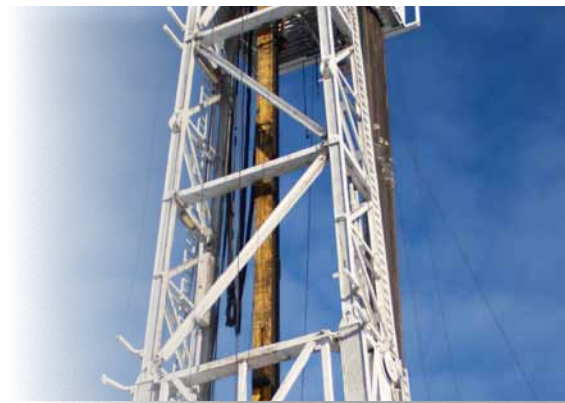
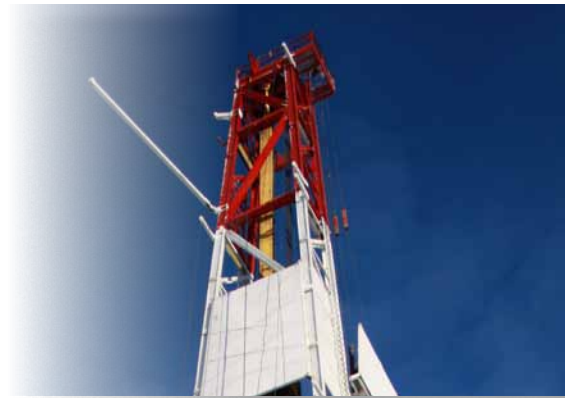
**JUST A FEW YEARS AGO, PEOPLE WERE** bracing for a shortage of natural gas in North America. Supplies of conventionally accessible gas were declining and contractors were considering options for importing liquefied natural gas – LNG – from other jurisdictions.

That all changed with the advent of technologies allowing for recovery of shale gas – an abundant form of natural gas with significant environmental benefits.

Natural gas is the world’s cleanest-burning fossil fuel. For example, converting just one heavy-duty truck from diesel to natural gas has the same effect as taking 325 cars off the road. As proven supplies increase, so do the incentives to replace coal-fired generation with natural gas. So we believe it has an important role in the global transition to cleaner energy sources.

B.C. has been developing shale gas resources since 2005, generating billions of dollars in government revenue from land sales and royalties. Now we’re moving forward to develop the potential of LNG for export.

Multiple investors across the natural gas sector have expressed interest in developing LNG export facilities. The first commercial LNG export facility in Canada is scheduled to open in Kitimat, on B.C.’s central coast, by 2015. And the Province has committed to working with interested investors, such as Shell Canada, to have three facilities in operation by 2020, assuming all environmental and permitting applications are granted.





*Courtesy of Apache Canada LTD.*

One of the first projects underway, the Kitimat LNG facility, has already earned federal and provincial environmental assessment approvals. It has strong support from the Haisla Nation, on whose land it's being built. And, in October 2011, it was granted the first-ever federal licence to export LNG from Canada. The Kitimat LNG plant will use clean electricity to liquefy natural gas, which results in lower emissions than plants elsewhere in the world.

Moving forward, additional LNG facility developments will use local clean energy with support from B.C.'s natural gas as necessary.

With this strategy, the Province intends to keep that momentum going, generating thousands of jobs and billions of dollars worth of new economic development to benefit families and communities in every part of British Columbia.

### **LNG: Generating Jobs and Revenues**

The Province has committed to having three LNG facilities in operation by 2020, assuming all environmental approvals are granted. Based on current estimates from project proponents, that could mean:

- \* over \$20 billion in direct new investment
- \* as many as 9,000 new construction jobs
- \* about 800 long-term jobs
- \* thousands of potential spin-off jobs
- \* over \$1 billion a year in additional revenues to government

# Vision: Three LNG plants in operation by 2020

## Goals:

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

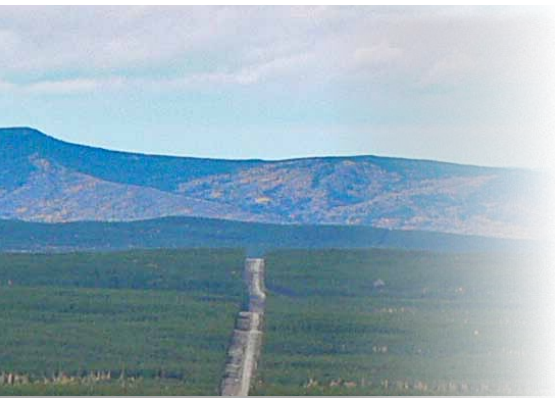
## 1. Keep B.C. competitive in the global LNG market



**NATURAL GAS IS ONE OF B.C.'S MOST ABUNDANT RESOURCES,** with vast untapped reserves throughout the northeast. Fears of a North American shortage disappeared in recent years with the advent of technologies making shale gas accessible. And while that has been a significant economic driver and revenue generator for our province, increased supply across North America has led to lower prices.

Natural gas will continue to be an important fuel for British Columbians, heating our homes, powering industry, and fueling our vehicles with fewer emissions than oil, gasoline or diesel. Developing liquefied natural gas for export will allow B.C. to dramatically expand its markets and meet growing demand in Asia.

B.C. currently produces 1.2 trillion cubic feet (Tcf) of natural gas per year. Meeting our LNG development goals could add another 1.9 Tcf per year.



China and Japan are both pursuing new supply – China to fuel its massive modernization, and Japan to diversify its fuel supply. With demand growing quickly, prices in Asia are also up to four times higher than they are in North America.

All of this adds up to a great opportunity. But B.C. is not alone in pursuing it. Asian demand is fuelling a global race for long-term contracts to supply LNG, and B.C. faces stiff competition from jurisdictions such as Australia, the U.S., Qatar and Africa.

### **B.C.'s LNG Advantages**

**B.C. is well positioned to compete for a share of the lucrative Asian LNG market. Our advantages include:**

- \* lower shipping costs, thanks to our proximity to Asia
- \* secure, stable government
- \* vast natural gas reserves
- \* high environmental standards
- \* potential to access clean electricity
- \* positive relationships with First Nations peoples
- \* a well-established service sector
- \* established, efficient single window regulator

The Kitimat plant is on target to be fully operational by 2015 and several other projects are at the proposal stage. Recognizing that time is of the essence, the Province is taking an aggressive approach to developing the sector:

- an efficient regulatory system for LNG growth has been established;
- overseas marketing is ramping up, supported by the New West Partnership with Alberta and Saskatchewan;
- work is underway to streamline federal and provincial environmental assessments to create a single, more efficient process;
- approaches to collaborative solutions for natural gas pipeline development are being explored, and
- collaboration with local communities, First Nations, industry and other levels of government is being strengthened to define more effective working relationships that benefit the entire province.

Next steps in helping to ensure B.C. has a competitive edge in this new global market will include investments in skills training. The Province is working with industry to define its needs and to help ensure the B.C. post-secondary system can deliver the targeted training needed to develop LNG, and to support the broader B.C. oil and gas sector.

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

### LNG – Helping to Address Global Climate Change

Climate change is a global issue. B.C.'s natural gas has the ability to offset the challenge by helping to lower world-wide greenhouse gas emissions.

LNG development in B.C. can have lower lifecycle greenhouse gas emissions than anywhere else in the world by promoting the use of clean electricity to power LNG plants.

Natural gas has a key role to play in reducing greenhouse gas emissions. This is one of the driving factors behind its growing use in Asia where it is replacing coal fired power plants and oil based transportation fuels with a much cleaner alternative.

**BRITISH COLUMBIA HAS A LONG HISTORY OF** clean energy leadership, dating back to the 1960s when BC Hydro was established. Today, clean hydroelectric power, along with other renewable sources such as wind power and biomass, meets over 93 per cent of British Columbia's electricity needs. We are also offsetting two-thirds of our electricity demand growth through efficiency and conservations measures.

B.C.'s commitment to clean energy is also supported by the landmark *Climate Action Plan*, the first and most ambitious of its kind in North America.

At the same time, a substantial amount of energy is needed to produce higher volumes of natural gas, and to operate LNG production plants. The first two LNG plants – BC Douglas Channel and Kitimat LNG – are anticipated to use clean electricity to drive the liquefaction process, the first LNG plants to do so in the world. As a result, LNG development in British Columbia would have lower lifecycle greenhouse gas emissions than anywhere else, differentiating us in the global LNG export market.

As part of this strategy, and as projects such as the Shell partnership come on stream, the Province and BC Hydro will continue to work with the industry, First Nations, and with clean-energy producers to develop clean, reliable, sustainable sources of supply.

Ultimately, British Columbia will maintain its place as a climate-action leader while moving forward to develop new economic opportunities. It's our chance to show the world that we can also lead in developing a new, clean industry.

As part of the *Jobs Plan*, the Province is also examining ways to grow the market for natural gas as a transportation fuel, in both CNG (compressed natural gas) and LNG forms. These alternatives can replace diesel in heavy duty fleets and other vehicles, and thereby help to lower emissions.



Converting just one heavy-duty truck from diesel to natural gas has the same effect as taking 325 cars off our roads.



### 3. Keep energy rates affordable

#### **LIKE MOST MAJOR INDUSTRIES, LNG PRODUCTION REQUIRES** a

steady source of power. In some cases, that could mean building new transmission lines or other types of infrastructure. That, in turn, has the potential to affect BC Hydro rates – and the Province is committed to ensuring the impacts on families and industry are minimized.

BC Hydro and the Province are currently working with LNG proponents to assess their future electricity needs – recognizing the key priority of keeping rates affordable. To offset the increased expense of operating new LNG facilities in the province, Government will ensure LNG developers contribute capital for infrastructure development and to the electricity supply required to serve each operation.

Another measure protecting consumers stems from a recent review of BC Hydro. That has led to changes in how government will implement its electricity self-sufficiency policy. This policy framework was originally implemented under the 2007 *Energy Plan* when economic growth was strong, natural gas prices were high and other jurisdictions were putting a price on carbon through taxes and planned cap and trade. Since that time, BC Hydro's operating environment has changed, with market electricity prices dropping significantly as a result of the slow economic recovery, low natural gas prices, and the over building of subsidized renewable energy in the United States.

The original self-sufficiency policy required BC Hydro to acquire new electricity supply assuming that inflows into provincial water reservoirs would be at historically low levels, and to acquire an additional 3,000 gigawatt-hours of "insurance" by 2020. Moving forward, BC Hydro will plan electricity needs based on average water conditions, and the insurance requirement will be removed. Future demand from industrial development will now drive the need to purchase additional power.

These changes will enhance BC Hydro's ability to optimize its unique and flexible hydro-based system and transmission connections to the western electricity market, creating more opportunities to earn income through short-term trading for the benefit of ratepayers.

The BC Hydro Review concluded that the impact of moving to average water and removing the insurance requirement would reduce electricity rate increases over the medium and long-term – up to eight per cent by 2016 and 20 per cent by 2020. This new policy direction will ensure that B.C. families and businesses will continue to enjoy some of the lowest electricity rates in North America, even as the government continues moving forward to implement the *Jobs Plan*.

“With BC Hydro, our government is planning to meet the power demands required by new LNG facilities. LNG expansion will not be held back by a lack of supply of electricity.”

—Canada Starts Here: The BC Jobs Plan

# Conclusion

**LNG IS A BRAND NEW INDUSTRY WITH MASSIVE POTENTIAL** for British Columbia. We have the supply, we have the technology, we have a great geographic advantage and, as we move forward to develop this industry, the whole province will benefit.

Thousands of people will have new jobs. Local economies will be more diversified. New skills training will be developed with new opportunities for future generations.

The LNG industry will generate economic spinoffs in areas such as the service sector and clean-energy development. First Nations will have new sources of economic strength and stability. And the Province will receive more revenues to pay for public services.

With this strategy, the government has laid out its critical priorities for LNG development:

- keeping B.C. competitive in the global LNG market;
- maintaining B.C.'s leadership on climate change and clean energy, and
- keeping energy rates affordable for families, communities and industry.

These three priorities will guide us going forward and help us to establish a thriving, competitive LNG industry that sets new standards for environmental and social responsibility.

As part of *The BC Jobs Plan*, this strategy is all about using our strengths to defend and create jobs in every community. This is B.C.'s time to lead and, together, we will.



Courtesy of TransCanada

“Not only have our people received immediate benefits from the project, in the form of a \$56 million payment for the sale of our equity in Kitimat LNG, but the long-term, regular lease and property tax payments combined with the employment and business opportunities associated with the project provide a greater measure of economic stability than we have ever experienced.”

– Former Haisla Nation Chief Counsellor Dolores Pollard  
March 9, 2011



THE BC  
JOBS PLAN

