CHAPTER 4: Emergency response systems of individual IEA countries

The ability of the International Energy Agency (IEA) to co-ordinate a swift and effective international response to an oil supply disruption stems from the strategic efforts of member countries to maintain a state of preparedness at the national level. Energy security is more than just oil, as the role of natural gas continues to increase in the energy balances of IEA countries. The most recently completed cycle of Emergency Response Reviews (ERRs) reflected this change by assessing, for the first time, the member countries’ exposure to gas disruptions and their ability to respond to such crises. This chapter provides general profiles of the oil and natural gas infrastructure and emergency response mechanisms for 29 IEA member countries.

Each country profile is set out in the following sequence:

**Key data**
Key oil data, 1990-2018
Key natural gas data, 1990-2018
Total primary energy source (TPES) trend, 1973-2012

**Infrastructure map**

**Country overview**

**OIL**
**Market features and key issues**
Domestic oil production
Oil demand
Imports(exports) and import dependency
Oil company operations

**Oil supply infrastructure**
Refining
Ports and pipelines
Storage capacity

**Decision-making structure**

**Stocks**
Stockholding structure
Crude or products
Location and availability
Monitoring and non-compliance
Stock drawdown and timeframe
Financing and fees

**Other measures**
Demand restraint
Fuel switching
Other

**GAS**
**Market features and key issues**
Gas production and reserves
Gas demand
Gas import dependency
Gas company operations

**Gas supply infrastructure**
Ports and pipelines
Storage

**Emergency policy**
Emergency response measures
Canada

Key data

Table 4.4.1  Key oil data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (kb/d)</td>
<td>1 964.7</td>
<td>2 729.3</td>
<td>3 040.9</td>
<td>3 333.0</td>
<td>3 526.7</td>
<td>3 759.8</td>
<td>5 001.9</td>
</tr>
<tr>
<td>Demand (kb/d)</td>
<td>1 721.6</td>
<td>2 013.9</td>
<td>2 315.0</td>
<td>2 264.6</td>
<td>2 266.0</td>
<td>2 286.5</td>
<td>2 220.3</td>
</tr>
<tr>
<td>Motor gasoline</td>
<td>585.1</td>
<td>659.1</td>
<td>704.0</td>
<td>754.6</td>
<td>762.4</td>
<td>739.4</td>
<td>-</td>
</tr>
<tr>
<td>Gas/diesel oil</td>
<td>400.9</td>
<td>489.9</td>
<td>531.9</td>
<td>552.4</td>
<td>565.0</td>
<td>533.7</td>
<td>-</td>
</tr>
<tr>
<td>Residual fuel oil</td>
<td>173.2</td>
<td>130.6</td>
<td>194.7</td>
<td>86.6</td>
<td>64.2</td>
<td>59.6</td>
<td>-</td>
</tr>
<tr>
<td>Others</td>
<td>562.3</td>
<td>734.4</td>
<td>884.4</td>
<td>871.0</td>
<td>874.3</td>
<td>953.8</td>
<td>-</td>
</tr>
<tr>
<td>Net imports (kb/d)</td>
<td>-243.1</td>
<td>-715.4</td>
<td>-725.9</td>
<td>-1 068.4</td>
<td>-1 260.7</td>
<td>-1 473.3</td>
<td>2 781.6</td>
</tr>
<tr>
<td>Import dependency (%)</td>
<td>-14.1</td>
<td>-35.5</td>
<td>-31.4</td>
<td>-47.2</td>
<td>-55.6</td>
<td>-64.4</td>
<td>125</td>
</tr>
<tr>
<td>Refining capacity (kb/d)</td>
<td>1 852.0</td>
<td>1 911.7</td>
<td>2 017.4</td>
<td>2 103.2</td>
<td>2 103.2</td>
<td>2 103.2</td>
<td>-</td>
</tr>
<tr>
<td>Oil in TPES** (%)</td>
<td>37</td>
<td>34</td>
<td>35</td>
<td>34</td>
<td>33</td>
<td>33</td>
<td>-</td>
</tr>
</tbody>
</table>

* Forecast.
** TPES data for 2012 are estimates.

Table 4.4.2  Key natural gas data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (mcm/y)</td>
<td>109 071</td>
<td>181 673</td>
<td>187 341</td>
<td>159 929</td>
<td>159 715</td>
<td>156 547</td>
<td>154 284</td>
</tr>
<tr>
<td>Demand (mcm/y)</td>
<td>67 319</td>
<td>91 537</td>
<td>92 035</td>
<td>95 642</td>
<td>102 421</td>
<td>100 706</td>
<td>106 509</td>
</tr>
<tr>
<td>Transformation</td>
<td>3 013</td>
<td>10 790</td>
<td>11 246</td>
<td>15 714</td>
<td>18 068</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Industry</td>
<td>24 920</td>
<td>28 660</td>
<td>26 933</td>
<td>30 960</td>
<td>32 907</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Residential</td>
<td>13 987</td>
<td>16 974</td>
<td>16 884</td>
<td>15 971</td>
<td>17 694</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Others</td>
<td>25 399</td>
<td>35 113</td>
<td>36 972</td>
<td>32 997</td>
<td>33 752</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Net imports (mcm/y)</td>
<td>-41 752</td>
<td>-90 136</td>
<td>-95 306</td>
<td>-64 287</td>
<td>-57 294</td>
<td>-55 841</td>
<td>-47 775</td>
</tr>
<tr>
<td>Import dependency (%)</td>
<td>-62.0</td>
<td>-98.5</td>
<td>-103.6</td>
<td>-67.2</td>
<td>-55.9</td>
<td>-55.4</td>
<td>-45</td>
</tr>
<tr>
<td>Natural gas in TPES (%)</td>
<td>26</td>
<td>29</td>
<td>29</td>
<td>31</td>
<td>33</td>
<td>33</td>
<td>-</td>
</tr>
</tbody>
</table>

* 2012 data are estimates.
** Forecast.

Note: This section on the emergency response systems of individual member countries was written by the IEA. All countries provided valuable information and comments. All opinions, errors and omissions are solely the responsibility of the IEA.
Figure 4.4.1  Total primary energy source (TPES) trend, 1973-2012
Map 4.4.1 Oil infrastructure of Canada

This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Map 4.4.2  Gas infrastructure of Canada

- FortisBC
- TransCanada mainline
- Spectra Energy Transmission System (formerly DETS)
- Trans-Quebec & Maritimes pipeline (TQM)
- Alliance pipeline
- Existing LNG terminals
- Planned LNG terminals
- Major export points

This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Country overview

Oil and natural gas are the dominant energy sources in Canada, each accounting for 33% of the country’s total primary energy supply (TPES) in 2012.

Canada is a significant net oil and natural gas exporter, and the country’s indigenous oil production is continuing to increase. Since 1999, oil production has consistently been rising, as new oil sands and offshore production have more than replaced declining production from ageing fields.

In 2012, Canada’s total oil production averaged 3.8 million barrels per day (mb/d). Conventional crude oil accounted for 2.2 mb/d of this production, and unconventional oil sand crudes for another 0.9%. Conventional crude oil production increased by 16% from 2010 to 2012, and unconventional oil sands crudes by around 13% during the same period.

Almost 40% of the oil produced domestically in Canada is exported – with net exports averaging 1.47 mb/d in 2012. Most of these exports go to the United States, with Canadian crude oil accounting for around 28% of total US crude imports in 2012.

Total Canadian oil resources are estimated at approximately 172 billion barrels, making Canada the world’s third largest resource holder after Saudi Arabia and Venezuela. Some 98% of this oil is located in the Alberta oil sands.

At the same time, Canada is not immune to the risks of a supply disruption. Despite increases in nearby offshore production, refiners in the country’s eastern provinces rely on imported crude oil, just as many refiners in other IEA countries do, and certain central provinces have experienced oil product disruptions, owing to their relative geographic isolation from alternative sources of supply. Moreover, with an extensive system of pipelines moving large volumes of oil from the west towards domestic and US markets across the continent, a significant disruption to any of these pipelines could pose a serious challenge to domestic oil supplies.

Although a major producer and exporter of natural gas, Canadian natural gas production is slowly declining. The country’s domestic production stood at 156.5 bcm in 2012, down from 187 bcm in 2005. Production levels are expected to continue to slowly decrease in coming years, reaching 154 bcm in 2018.

Despite the decline, Canadian domestic production still exceeds domestic demand by around 55%. Domestic demand for gas in 2012 stood at around 100 billion cubic metres (bcm), leaving 56 bcm available for export that year. As of the end of 2012, all this surplus production is exported to the United States, but there is the possibility that Canada may start exporting liquefied natural gas (LNG) further afield as early as 2015.

The natural gas market in Canada – and in North America as a whole – is resource-rich, efficient, vast, competitive and diversified. In combination, these market characteristics make a strong, positive contribution to Canada’s natural gas supply security.

Oil

Market features and key issues

Domestic oil production

In 2012, Canada’s total oil production averaged 3.8 mb/d. Conventional crude oil (light, medium, heavy and offshore oil) accounted for about 2.2 mb/d of the
country’s production, natural gas liquids (NGLs) accounted for a further 0.6 mb/d, and unconventional oil sands crudes (bitumen blend, synthetic bitumen blend and upgraded oil sands light) accounted for 0.9 mb/d.

All three categories of oil production are increasing (and have been increasing since 1999), with crude oil up by almost 16% from 2010 to 2012, NGLs up by 2.3% from 2010 to 2012, and unconventional oil sands crudes up by more than 13% during the same period. According to International Energy Agency (IEA) figures, Canadian total oil production will continue to increase rapidly, and is estimated to reach more than 5 mb/d by 2018.

Oil demand
Total oil demand in Canada has been relatively flat in recent years, averaging 2.29 mb/d in 2012, up slightly from 2.27 mb/d in 2011. Canadian oil demand is expected to remain flat, or decline, in the medium term – with a decline to 2.22 mb/d forecast for 2018 (according to IEA figures).

The transport sector accounted for some 54% of the country’s oil demand in 2011, with industry a distant second at 22%. The transformation sector only accounted for 12% of Canada’s oil consumption.

The biggest single source of oil product demand in 2012 was gasoline, which accounted for 32% of total Canadian oil demand in 2012, followed by diesel at 13%, and other gasoil accounting for 12% of total demand.
Imports/exports and import dependency

Canada is a large and growing net exporter of crude oil, and is likely to remain so for the foreseeable future. Almost 40% of the oil produced domestically in Canada is exported – with net exports averaging 1.47 mb/d in 2012. These exports are destined almost entirely for the United States. This made Canada the largest single source of crude oil imports for the United States in 2012 – with Canadian oil accounting for around 28% of total US crude imports.

However, despite being a significant net exporter, Canada still imports limited amounts of crude oil (714 kb/d in 2012) to supply some domestic markets. While most of the country’s oil exports are produced and shipped from western Canada and the offshore Atlantic east coast oilfields, crude oil is at the same time imported to supply the eastern and central regions. For example, some of the refineries in eastern Canada source their crude oil supplies from overseas (including the United States).

The country’s crude oil imports are well diversified, coming from a wide range of countries. The largest single source of imports in 2012 was Algeria which accounted for 19% of the total, followed by Iraq at 12% and Saudi Arabia at 9%.
**Oil company operations**

In August 2009, Suncor merged with Petro-Canada to create Canada’s largest upstream oil producer. The newly enlarged company, Suncor, became the second largest refiner of gasoline and oil products, and the fifth largest oil and gas company in North America based on market share.

The company is fully privatised as the federal government’s last remaining stake was sold in 2005. Many major international oil companies have Canadian affiliates, such as Chevron Canada Resources, Imperial Oil Ltd. (Exxon), Shell Canada Ltd., BP Canada Energy Company, ExxonMobil Canada Ltd. and ConocoPhillips Canada Ltd.

**Oil supply infrastructure**

**Refining**

As of the end of 2012 Canada had 15 operational refineries with a total crude oil refining capacity of 1 940 kb/d. Canadian refineries have undergone significant rationalisation over the past three decades, so that the number of refineries has dropped from a high of 40 in the 1970s to the 15 operating in 2012 – with more refinery closures expected.

Since the early 1990s, the country’s refining capacity has been relatively stable, with utilisation rates averaging around 87% nationally from 2003 to 2012. The country now has two main refining centres: Edmonton, Alberta and Sarnia, Ontario.

**Figure 4.4.5** Refinery output vs. demand, 2012

**Ports and pipelines**

As of the end of 2012, Canada had about 825 000 km of oil transmission and distribution pipelines – of which 71 000 km are federally regulated. (Pipelines are only regulated by the National Energy Board [NEB] if they cross provincial or international borders). The oil produced domestically in western Canada is shipped to domestic and US markets through three main pipeline systems:

- Enbridge Pipeline, which accounts for the bulk of Canadian exports, delivers 2.2 mb/d of oil from Edmonton into Ontario and the US Great Lakes region.
Express Pipeline, which delivers crude from Alberta into Wyoming (170 kb/d) and onward into Illinois (120 kb/d) via its Platte Pipeline connection.

Trans Mountain Pipeline (TMPL), which can transport both crude and products (225 kb/d), delivers oil mainly from Alberta west to Vancouver and the Puget Sound region of the United States.

Canada’s oil pipeline capacity is under constant pressure from steadily growing production levels, and there are a number of pipeline companies proposing new infrastructure in Canada.

With regard to port infrastructure, major oil off-loading ports exist in the following cities:

- Quebec
- Saint John, New Brunswick
- Dartmouth, Nova Scotia
- Come By Chance, Newfoundland and Labrador.

Port facilities are also required for oil imports into Canada. As noted earlier, although a major net exporter of oil, Canada imports a significant proportion of the crude oil required for its domestic refineries owing to transport costs and other logistical issues. For this purpose, tankers deliver oil into Newfoundland, Nova Scotia, New Brunswick and part of Quebec.

Storage capacity

Canada does not have publicly held stocks and does not impose a compulsory stockholding obligation on industry. All the country’s oil stocks are industry stocks held for commercial purposes. According to IEA figures, the total volume of crude oil and product stocks held by industry in 2012 was 172 million barrels.

Decision-making structure

Both the federal government and the provincial/territorial governments play a major role in Canada’s energy policy based on the constitutional division of power between the federal and provincial/territorial governments.

The provinces own all natural resources within their geographic boundaries and are responsible for the conservation, development and management of those resources. The federal government is responsible for matters relating to inter-provincial and international trade, programmes and policies in the national interest (including national economic development and energy security) and resource management on federal lands. The federal government retains control over the resources in the three northern territories, as well as Canada’s offshore production. However, because most of Canada’s hydrocarbon production and demand occurs within the provinces, the federal government’s formulation of energy policies is closely tied to those of the provinces.

Under certain circumstances, the federal government has the authority, under the Energy Supplies Emergency Act, to take measures to reallocate energy supplies within Canada. These circumstances include the declaration of a national emergency, and an IEA collective action under the provisions of the International Energy Program (IEP).

The Energy Supplies Emergency Act provides the authority for the Energy Supplies Allocation Board (ESAB) – a key agency in the event of an oil supply disruption. During periods of business as usual, the Oil Sands and Energy Security Division of Natural Resources Canada serves as the national emergency strategy organisation (NESCO).
However, in an emergency situation, when enabling legislation is activated, there is a much larger emergency organisation that is mobilised under the ESAB.

This ESAB-led group comprises a chairperson and five members. The chair is appointed by the Governor in Council and reports to the Minister of Natural Resources Canada. The board is supported by the Oil Sands and Energy Security Division of Natural Resources Canada and includes personnel from oil companies (in the form of the Petroleum Industry Advisory Committee), transportation organisations, other federal government departments and the provinces (in the provincial advisory committee). The use of the federal government’s emergency powers requires provincial consultation before taking emergency action to address some form of market failure.

**Stocks**

**Stockholding structure**

As a net exporter, Canada does not have an IEA 90-day stockholding obligation. Canada also does not hold any bilateral stocks for other IEA member countries. All stocks held in Canada are owned by industry. As oil companies are not required to hold emergency stocks in normal times, they maintain stocks for operational and logistical purposes only.

In a declared national emergency, the ESAB would have the authority to regulate company stocks and to penalise companies for violation of its orders under Section 41 of the Energy Supplies Emergency (ESE) Act 1985. Under the ESE Act (Sec. 25 (d)), the ESAB has the authority to regulate the building, storage and disposal of stocks, including industry stocks, during a declared national emergency. The threshold level for triggering the regulation would be decided by the government in consultation with the oil industry on a case-by-case basis. The mechanism requires monthly reports to the ESAB by each company on its stock situation. As the government’s emergency policy emphasises market mechanisms and would only use allocation actions as measures of last resort, it is unlikely that commercial stocks would be directed in such a manner.

**Crude or products**

As of April 2013, total stocks held by industry were made up of around 65% crude, NGL and feedstocks, and 35% finished products.

**Location and availability**

Industry holds storage facilities along the supply chain for normal operations. Industry stock levels are relatively stable in terms of demand coverage. On average, product inventories provide about 20 to 30 days of forward demand cover, and crude oil inventories have been in the range of 70 to 100 days.

**Stock drawdown and timeframe**

In the event of a declared national emergency, a drawdown of industry stocks could be carried out by oil companies under the mandatory allocation programme. Initial data submissions would be received by the NESO, and, after consultation with industry via the government’s existing advisory committee, a decision would be taken (including an agreement upon the level of stockdraw required and confirmation of the timing) and a stock drawdown would be initiated. Stocks would be released into the market by companies meeting their crude oil entitlement and the product entitlements of their customers. The ESAB has the power to establish parameters for prices, as well as set prices, if necessary, at the time of emergency. This sequence of events would require
about two to three weeks. The Canadian government indicated that the procedure has been tested on several occasions on paper, but never in a physical situation.

**Financing and fees**

There are no stockholding obligations on the oil industry in Canada; all oil stocks are held by market operators for normal commercial purposes. Oil companies recoup the costs of stockholding through their normal operations and consumer pricing.

**Other measures**

**Demand restraint**

The specific procedures for demand restraint in Canada are described in the ESE Act. Additionally, the Emergencies Act, established in 1988, provides a more flexible approach to demand restraint, allowing Cabinet to authorise the “requisition, use or disposal” of energy commodities. In order to activate either of these legal instruments, Cabinet must first declare an energy-related national emergency.

Theoretically, in an IEA-declared emergency, demand could be restrained by federal mandate through implementation of the Crude Oil and Products Allocation Program. Further demand restraint measures would be implemented by the provinces and territories to complement actions imposed by the federal government.

During an oil supply disruption, and under a declared national emergency, the ESAB would activate allocation plans to ensure that crude oil and products are distributed fairly and equitably to all citizens.

- **The Crude Oil Allocation Program** apportions available crude oil from offshore and domestic sources to refineries throughout Canada, and can be used to free up crude for export, in the case of a supply obligation in the IEP's emergency sharing system.

- **The Petroleum Products Allocation Program** controls the volume of products that refiners and other major suppliers may sell to wholesale customers. Demand restraint in petroleum products could be achieved through the issue of allocation factors which are designed to limit current sales at the wholesale level in each of three priority categories of historical sales, and the effects would be felt immediately. Progress would be monitored on a monthly basis. The three priorities of use are: (a) health, welfare and security of Canadians (e.g. hospital services, fire and police protection, national defence or public transit); (b) economic stability (e.g. most industrial and commercial activities, including public utilities, postal services, taxis and road maintenance); and (c) discretionary activities related to the maintenance of the standard of living (e.g. supplies of gasoline at service stations and of fuels for heating commercial buildings). It would take up to 60 days after the declaration of an emergency to fully implement the mandatory products allocation and issue product entitlements.

- **Rationing of gasoline and diesel fuel through coupons** can be implemented as a last resort.

The decision process for activating the programme is described in the ESE Act and would involve recommendations from the Board to the Governor in Council (the Cabinet of the federal government).

In the event of an oil supply disruption, the provinces and territories have the authority to implement demand restraint measures.
Fuel switching
There are no fuel-switching policies in place in Canada.

Other
Canada’s federal government cannot really use surge production as an emergency response measure for three main reasons. First, most domestic oil production is already running at maximum potential for commercial purposes. Second, surge production can only be achieved over a short period of time, as there is risk of damaging wells and reservoirs. Third, the federal government has little control over surge production because most oil resources are under provincial jurisdiction.

Gas

Market features and key issues

Gas production and reserves
Canada is a major producer and exporter of natural gas, with domestic production standing at 156.5 bcm in 2012, down from 187 bcm in 2005. The Western Canada Sedimentary Basin (WCSB) accounts for 99% of domestic production. Alberta accounted for 73% of WCSB production, while British Columbia and Saskatchewan accounted for 23% and 3%, respectively. The remaining 2% of domestic supply is produced in Atlantic Canada, the majority from offshore sources, but a small amount of natural gas is also produced in the north of the country.

Natural gas production levels are expected to slowly decrease in coming years, with production forecast to decline to 154 bcm in 2018 according to IEA figures. Despite the decline, Canadian domestic production still exceeds domestic demand by around 55%. All this surplus production is currently exported to the United States, but there is a possibility that Canada may start exporting LNG abroad as early as 2015.

It should be noted that under the Canadian constitutional framework, provincial governments have jurisdiction over the upstream (exploration and production), and the downstream natural gas markets (distribution). The federal government mainly has jurisdiction over international and inter-provincial trade and pipelines.

Gas demand
From 1990 to 2012, demand for natural gas increased by 49%, from 67.3 bcm to just over 100 bcm.

There is a broad range of demand sources for natural gas in Canada. The largest of these is the industry sector which accounted for 32% of gas demand in 2011, followed by the transformation sector at 18% and the residential sector at 17%. Natural gas is widely used for residential and commercial heating, particularly in the winter months.

Another significant source of natural gas demand in Canada is the (non-transformation) energy sector – especially with regard to oil sands production. The domestic Canadian energy sector accounted for 16% of natural gas demand in 2011.

Despite a progressive increase in demand for natural gas for transformation purposes (from 9% in 1974 to 18% in 2011), natural gas is not a principle source of fuel for the electricity generated in Canada.
Gas import dependency

Canada’s net natural gas exports in 2012 totalled around 56 bcm. However, despite the country’s status as a significant net exporter of natural gas, there are some import points in Canada located in southern Ontario, where it is typically cheaper to import gas from the US than to ship gas from western Canada through northern Ontario. According to IEA figures, Canada imported just over 31 bcm of natural gas in 2012, while at the same time the country exported around 87 bcm of natural gas – all to the United States.

Gas company operations

Canada has a highly competitive natural gas industry, with hundreds of exploration and production firms operating in the country and no firm having a large enough market share to set prices. According to figures supplied by the government, in 2012 the top 20 producers accounted for some 71% of total production, and the top 100 producers for approximately 87% of total production.

Canada’s natural gas gathering, transmission and distribution pipeline network is predominantly owned and operated by publicly traded companies. There are, however, a few transmission and distribution pipelines that are owned by Provincial Crown Corporations, such as SaskEnergy in Saskatchewan, and Manitoba Hydro in Manitoba.

Storage facilities in the producing region of western Canada are typically owned by pipeline companies or producers, while in eastern Canada, storage facilities are typically owned by local distribution companies. Distribution is handled by private companies which have exclusive rights to distribute gas in a given regional or local area, and are provincially regulated.

Gas supply infrastructure

Ports and pipelines

Canada became an LNG importer in June 2009 when the Canaport terminal in Saint John, New Brunswick came on line. Canaport is designed as an import terminal for gas...
that is then re-exported by pipeline to feed growing Northeast US markets. There is no domestic need for the gas imported through Canaport as natural gas demand in Atlantic Canada is fully met by offshore Nova Scotia production.

Because of the significant gas production in Canada, there is an extensive network of gas pipelines throughout the country. The natural gas network in Canada is very well integrated with that of the United States. According to the Canadian Energy Pipeline Association (CEPA), the total length of the natural gas transmission and distribution pipeline network in Canada is about 550,000 km (as of the end of 2012). Around 100,000 km of the network is made up of transmission pipelines, and 450,000 km of distribution pipelines.

Storage
Canada has significant natural gas storage infrastructure that is usually used for servicing peak winter demand. The country has approximately 23.4 bcm of domestic storage capacity (equivalent to about 23% of annual demand) and also has access to an additional 85 bcm of storage in the United States. These storage volumes can be drawn down on very short notice to help satisfy demand or to help address a supply shortfall.

Emergency policy
Canada’s federal government has considerable powers to control natural gas flows in a declared national emergency under the Emergencies Act. However, if a national emergency is not declared, then natural gas flows fall under provincial jurisdiction.

Canadian natural gas emergency response policy is generally geared towards short-term rather than long-term supply disruptions. The reason for this is that the government considers that long-term risk is not particularly relevant for North America, as the North American natural gas market is resource-rich and is an open, well-interconnected, competitive commodity market.

Emergency response measures
In the case of a natural gas supply disruption, Canada has a number of options for continuing to meet natural gas demand.

- The country has significant natural gas storage infrastructure that is usually used for servicing peak winter demand. These storage volumes can be drawn down on very short notice to help satisfy demand or to help address a supply shortfall. Canada does not possess strategic gas stocks, and there are no government-imposed requirements for any market participant to hold any minimum level of stocks.

- Although a net exporter of natural gas, Canada also has the facilities to import gas. In the event of a gas supply disruption, Canada could import additional natural gas via pipelines from the United States. In the event of a prolonged disruption, Canada could also bid on spot LNG cargoes, to be received at the Canaport terminal.

- Many industrial natural gas consumers are on “interruptible” service contracts, with the consequence that their natural gas supplies can be diverted elsewhere if required. Shedding demand through interruptible service clients would help in the case of a supply disruption.

- A reduction in natural gas export volumes may also be an option in some emergency scenarios. The North American Free Trade Agreement (NAFTA) prohibits the Government of Canada from imposing any export volume restrictions except under certain circumstances. These exceptions include: the relief of a critical shortage of natural gas;
domestic price stabilisation; the acquisition of products in short supply; and conservation measures in relation to restrictions on domestic production or consumption. However, any export restriction would invoke the proportionality clause, which provides that the restriction must not reduce the proportion of Canadian production offered to export customers below the percentage of Canadian production exported over the previous 36 months. It is important to note that in the case of an IEA emergency, Canada’s IEA obligations supersede any NAFTA restrictions.

- While it may be possible for some electricity generators to switch to different fuels, in a scenario where natural gas is unavailable a natural gas supply disruption would more likely be handled by using other forms of power generation to meet demand. Canada is not heavily reliant on natural gas for electricity supply, and it is likely that other supply options would be sufficient to maintain reliability.

- Fuel switching exists in some industrial facilities with the alternative fuel represented by oil, coal and wood. The reason for fuel switching for natural gas consumers is the fuel price. Given that the Canadian/US natural gas market is flexible, well-functioning, and reliable, there are no requirements to maintain specific stocks of alternative fuels. For electricity generation, there are no requirements to maintain stocks of alternative fuels at the provincial level, or at the federal level, as electricity supply falls under provincial jurisdiction.