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World Bank Global Gas Flaring Reduction – Private Public Partnership Implementation Plan for Canadian Regulatory Authorities

Submitted by:

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Saskatchewan Ministry of Energy and Resources • Manitoba Science, Technology, Energy and Mines
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National Energy
Board

Office national
de l'énergie



OIL AND GAS COMMISSION



ERCB *Energy Resources
Conservation Board*



Saskatchewan
Ministry of
Energy and
Resources





Canadian International
Development Agency

Agence canadienne de
développement international

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1. History of World Bank GGFR Initiative

The Global Gas Flaring Reduction public-private partnership (GGFR) was launched at the World Summit on Sustainable Development in August 2002 with representatives of governments of oil-producing countries, state-owned companies, major international oil companies, and donor countries to overcome the worldwide barriers of reducing associated gas flaring by sharing global best practices and implementing country specific programs.

The GGFR partnership, a World Bank-led initiative, facilitates and supports national efforts to use currently flared associated gas by promoting effective regulatory frameworks and tackling the constraints on gas utilization, such as insufficient infrastructure and access to local and international energy markets, particularly in developing countries.

Poverty reduction is part of the GGFR program, which includes developing methods so that the otherwise flared and wasted natural gas and liquefied petroleum gas (LPG) can be used for the benefit of the people. The program has evaluated opportunities for small-scale gas utilization in several countries.

The Voluntary Standard for Global Gas Flaring and Venting Reduction (the "Standard") provides guidance on how to achieve reductions in flaring and venting of gas associated with crude oil production worldwide. The approach set forth in the Standard is intended to support other flare reduction initiatives and go beyond prevailing flaring and venting practices that would otherwise occur in many countries. The parties supporting this Standard voluntarily chose to endorse the principles laid out in the Standard and to work in cooperation with GGFR Partners to seek solutions to overcome barriers that result in gas flaring and venting.

Every year, the equivalent of the annual gas consumption of France and Germany combined is flared around the world and has not abated over the past 20 years.

Canada is considered to be an international leader in effective flaring and venting reduction practices. Accordingly, Canada was invited to participate in the global reduction effort. Nonetheless, Canadian regulatory authorities have endorsed the global standard and are continuing in their efforts for further reductions.

To assist in the global reduction effort, including the poverty reduction element, the Government of Canada through the Canadian International Development Agency (CIDA) has provided significant financial support to the World Bank for the partnership effort.

2. International Governmental Support

At the 2005 G8 meeting in Gleneagles, Scotland, the joint communiqué signed by the G8 leaders on the subject of climate change, clean energy and sustainable development section 15, article (a) and (b) stated the following:

15. We will encourage the capture of methane, a powerful greenhouse gas, by:

- (a) supporting the Methane to Markets Partnership and the World Bank Global Gas Flaring Reduction Partnership (GGFR), and encouraging expanded participation; and*
- (b) working bilaterally to support an extension of the World Bank's GGFR Partnership beyond 2006*

In July 2006, the G8 leaders met in St. Petersburg, Russia. Global Energy Security was discussed. More specifically the G8 Global Energy Security text is as follows;

20. Increasing energy saving and efficiency we will pay more attention to the energy sector itself, which can contribute significantly to this end by reducing losses in production and transportation. Our priority measures in this area will include:

- * raising the environmental and efficiency levels for processing hydrocarbons;*
- * reducing gas flaring to minimal levels and promoting utilization of associated gas;*
- * improving energy infrastructure, including minimizing oil and oil products losses in transportation and gas emissions from gas systems;*
- * using methane otherwise released in the atmosphere from coal mining, landfills, and agricultural operations.*

25. We encourage all oil producing states and private sector stakeholders to reduce to minimal levels natural gas venting or flaring by facilitating the use of associated gas, including its refining and processing into fuels and petrochemical products. In this respect we support the efforts of Global Gas Flaring Reduction Partnership (GGFR) and Methane-to-Markets Partnership (M2M) to implement projects on the production of marketable methane from landfills, agriculture waste and coal-bed methane, particularly in developing countries.

3. Environmental Regulation in Canada

Environment Canada is a department of Canada's Federal Government. As its name implies, it is responsible for impact on air, water and land from potential pollutants. The department does not directly regulate the oil and gas industry in the country but plays an important role in setting environmental standards.

As part of their mandate, Environment Canada set a national standard, the National Ambient Objective (NAO) for different air pollutants, which include those from flaring and venting. More recently, Environment Canada worked with other jurisdictions through the CCME process and developed Canada-wide Standards for a number of air pollutants including fine particulate matter, ozone and benzene.

Environment Canada works with the provinces and for example, in Alberta, is a member of the Air Quality Objective Stakeholder Advisory Committee. Also, Environment Canada administers Canada's National Pollutant Release Inventory (NPRI) to which companies who wish to flare and vent large volumes of gas, must report. This is in addition to reporting requirements at the provincial level. Environment Canada has supported flaring and reduction research in Canada and has supported the World Bank global effort.

Provincial ambient air quality objectives are set by individual provinces. Further, the oil and gas regulatory authorities establish flaring and venting regulations that may require reductions beyond the requirements of the environmental authorities.

4. Endorsement by Canadian Regulatory Authorities

As part of the launching of the GGFR, the World Bank initiated a Global Steering Committee. Following an invitation by the World Bank, the Energy Resources Conservation Board in Alberta (ERCB) joined the Steering Committee as an initial founding member. CIDA subsequently agreed to financially support the initiative and, as a donor, is also represented on the Steering Committee.

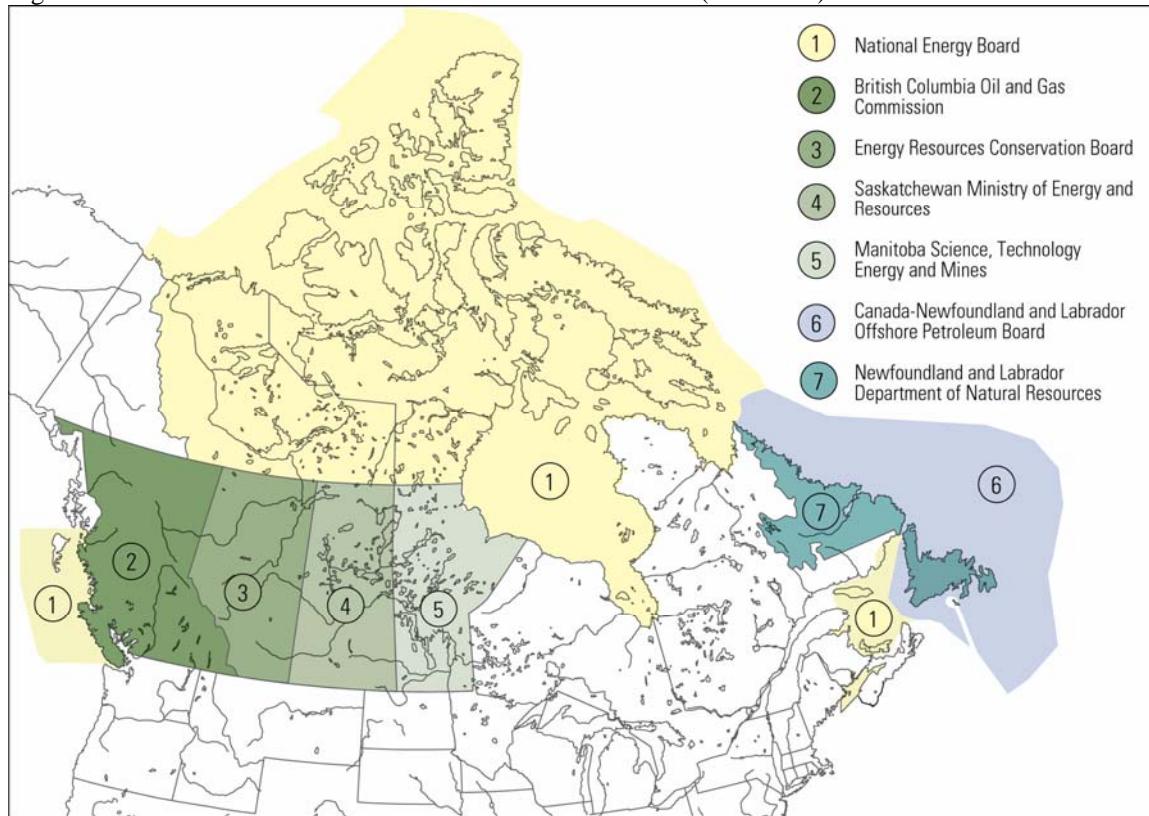
One of the initiatives of the Steering Committee was the creation of a Global Gas Flaring Reduction Voluntary Standard. The ERCB was involved in the drafting of the Standard as part of the GGFR technical committee developed for this task and the ERCB formally endorsed the Standard in May 2004. Subsequently, other Canadian regulatory authorities expressed an interest to endorse the Standard and did so at varying times. For purposes of the endorsement schedule, the World Bank has advised that January 1, 2006 should be considered as the endorsement time for the Canadian entities other than the ERCB.

In Canada, oil and gas activities are regulated by federal and provincial authorities. For the non-accord Canada lands, activities are regulated by the federal Government or, in the case of accord areas, by joint federal and provincial governments. For all other lands, activities are regulated by the respective provinces. Accordingly, Canada's Implementation Plan is composed of a series of plans aligned with the respective legislative authorities.

Although other Canadian regulatory authorities are considering formal endorsement of the Standard, and have participated in the flaring reduction discussions, the following authorities have formally endorsed the Standard as of June 2008 and represent approximately 99 % of Canada's oil production and associated gas.

- National Energy Board
- British Columbia Oil and Gas Commission
- Energy Resources Conservation Board
- Saskatchewan Ministry of Energy and Resources
- Manitoba Science, Technology, Energy and Mines
- Canada-Newfoundland and Labrador Offshore Petroleum Board
- Newfoundland and Labrador Department of Natural Resources.

Figure 1 Global Standard Endorsements: Canadian Jurisdictions (June 2008)



5. Best Practice Sharing

Following endorsement of the Standard, several Canadian jurisdictions expressed an interest in sharing best practices in reducing and jointly contributing to the development of a country implementation plan in a workshop setting. Jointly sponsored by the Energy Resources Conservation Board (ERCB) and the National Energy Board (NEB), the first Pan-Canadian Regulators Workshop, including the World Bank's representative, met on September 14, 2006.

The meeting had two objectives:

1. Review the respective regulator's environment vis-à-vis the Global Gas Flaring Reduction of associated gas sponsored by the World Bank; and understand the voluntary commitments under the Global Standard.
2. Move towards a "Country Implementation Plan (CIP)" to be submitted prior to the Global Forum on Flaring Reduction and Gas Utilization conference to be held December 13-15 in Paris, France, recognizing that the CIP for Canada is actually a compilation of the plans of the regulatory authorities.

6. Associated Gas Production in Canada

Crude oil production in Canada began in 1858 (Ontario). Across Canada, the legislative and regulatory framework regarding associated gas flaring and venting is well established and has been implemented for many decades. For example, the Alberta Petroleum and Natural Gas Conservation Board, a predecessor to the Energy Resources Conservation Board, was formed by the provincial government in 1938, specifically to deal with the large amount of flaring at the time.

In 2007, the total associated gas production for Canada was $23.7 \cdot 10^9 \text{ m}^3$ (840.1 BCF). The following table represents the breakdown by the respective Canadian legislative areas of associated gas production for 2007:

Table 1 2007 Associated Gas Production: Endorsing Jurisdictions

| Canadian Standard Endorsing Jurisdictions | Yearly Oil Production (2007) | | Yearly Associated Gas Production (2007) | |
|--|---|---------------|--|--------------|
| | 10³ M³ | MMBbls | BCM | BCF |
| Alberta Conventional oil and Bitumen | 61,281 | 385.6 | 16.09 | 568.4 |
| Alberta Surface Mineable Oilsands | 45,518 | 286.4 | 0 | 0 |
| BC | 1537 | 9.6 | 1.04 | 36.5 |
| Non-Accord Federal lands (NWT, ...) | 858 | 5.4 | 0.185 | 6.5 |
| Newfoundland and Labrador (Offshore) | 21,381 | 134.5 | 4.46 | 157.6 |
| Newfoundland and Labrador (Onshore) | 0.705 | 0.00443 | 0.000445 | 0.0157 |
| Manitoba | 1267 | 7.9 | 0.0232 | 0.823 |
| Saskatchewan | 24,811 | 156.1 | 1.99 | 70.3 |
| Total | 156,653.7 | 985.5 | 23.7 | 840.1 |

The above endorsing jurisdictions represent more than 99 % of oil and associated gas production in Canada.

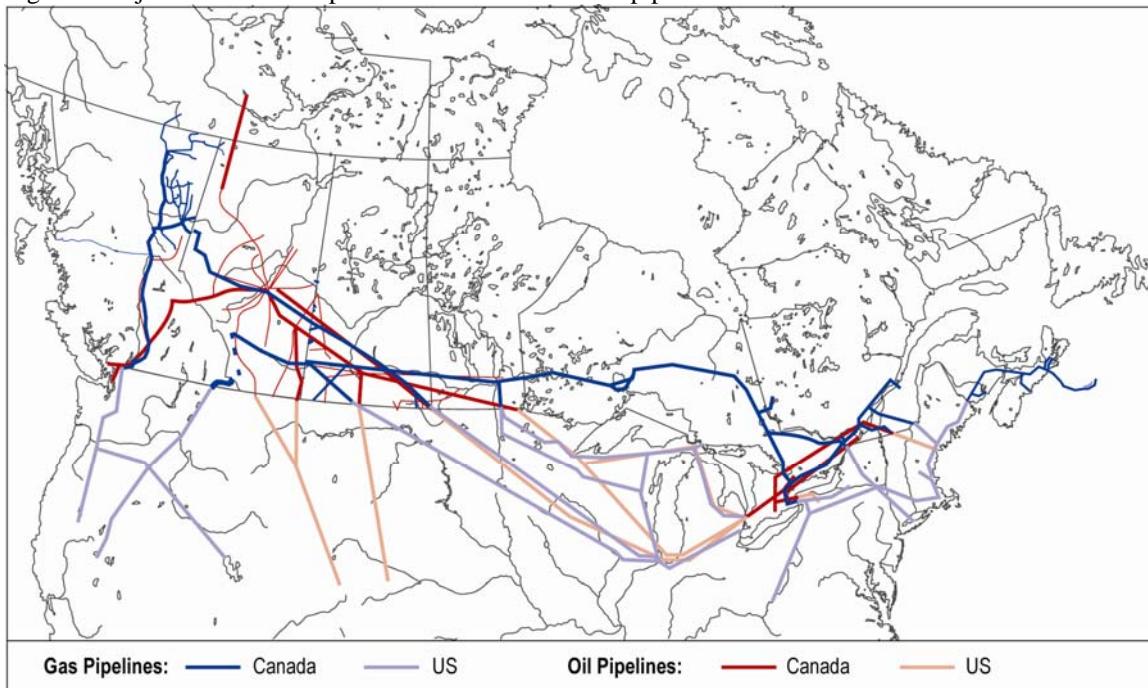
In 2007, the average national utilization rate of associated gas in Canada was approximately 93.6% of the total associated gas production of 23.7 BCM.

7. Domestic and International Markets

The utilization of natural gas in Canada is well developed for domestic heating, power generation, industrial, and commercial use. The produced gas is also used for fuel in industrial applications, oilfield operations, oil sands processing, and the produced gas is also re-injected in some producing fields. The national and North American pipeline infrastructure is well-developed and continues to expand.

Canada's natural gas export to the United States of America is approximately half of its domestic natural gas production in extensive transportation system.

Figure 2 Major Canadian interprovincial and international pipelines.



8. Legal Framework

Although in most Canadian jurisdictions, Federal and Provincial governments own the majority of subsurface mineral rights, First Nations, aboriginal groups, some private landowners, and some corporations also own freehold subsurface mineral rights. In Manitoba, 80% of oil and gas rights are freehold.

Exploration, development, production, and transportation of hydrocarbons activities in Canada are almost exclusively conducted by private industry.

The mineral lease framework is very well established. Rights for the oil almost always include the lease rights for the associated natural gas. The oil producers therefore, have the same rights and responsibilities for the associated gas as for the oil. Separate natural gas rights for non-associated gas exist in certain circumstances which can at times result in a “split-lease” situation.

The legislative framework and associated regulations for conservation of associated gas is well developed through independent public regulatory agencies formed by federal and provincial governments or by government directly through a department as shown in the following table:

Table 2. Form of Regulatory Jurisdiction: Agency vs. Department

| Jurisdiction | Name | Form of Reg. Authority (Independent Agency or Department of Gov't) |
|--------------------------------------|---|---|
| British Columbia | Oil and Gas Commission | Independent Agency |
| Alberta | Energy Resources Conservation Board | Independent Agency |
| Saskatchewan | Saskatchewan Ministry of Energy and Resources | Ministry of Gov't |
| Manitoba | Manitoba Science, Technology, Energy and Mines | Department of Gov't |
| Newfoundland and Labrador (Offshore) | Canada – Newfoundland and Labrador Offshore Petroleum Board | Independent Agency |
| Newfoundland and Labrador (Onshore) | Newfoundland and Labrador Department of Natural Resources | Department of Gov't |
| Non-Accord Federal Lands | National Energy Board | Independent Agency |

Note: Shown for jurisdictions that have endorsed the Global Standard only

In addition, there is a well-developed legislative and regulatory environment for oil and gas transportation, whereby most transmission pipelines are open-access pipelines.

Typically, the major natural gas transmission pipelines (downstream of the gas processing plants) that take natural gas to markets are also regulated cost-of-service pipelines. Pipelines that are wholly within provincial boundaries would normally be provincially regulated whereas pipelines that cross provincial or national borders are regulated by the National Energy Board. Provincially regulated pipelines are often, but not always, financially regulated on a cost of service basis.

Natural gas pipelines that distribute the gas from the transmission lines to the end customers are normally regulated by provincial public utility type commissions on a cost-of-service basis.

9. Fiscal Framework

In all jurisdictions, royalties are paid on all hydrocarbon products and differ for each product line sold. Although the specifics may vary from one jurisdiction to another, the following are common attributes for the natural gas royalty system:

- The producers are responsible for marketing the gas and remitting the royalty portion to the government or freehold owner.
- A production tax is paid on associated gas produced from freehold mineral rights.

- The royalty rate for associated gas is usually the same as for non-associated gas.
- There may be royalty reductions for low productivity wells and credits for the processing costs of associated and non-associated gas.
- Normally royalty is not charged on flared volumes of gas.
- In addition, where the value of the royalty would make a critical difference to the economic feasibility of gas utilization, a royalty waiver may be available.

Taxation is charged at the corporate level at both the provincial and federal levels. Some major projects may have special depreciation or other taxation provisions. All gas is priced at market rates. Prices of the well-head price of oil or gas are determined by the market. Well-head price controls were eliminated in the mid 1980s.

10. Infrastructure Development

The necessary infrastructure can be built upon application and approval by the relevant regulatory authority. There are a number of additional approvals (e.g. environmental, municipal) depending on the size of the projects. Although the approval processes for small and medium size projects are normally handled routinely and simply, in the absence of bona-fide objections as recognized in the various statutes. The approval process for siting approvals and construction can be lengthy for large complex projects.

In Alberta, the landowners where the energy facility is to be constructed or directly and adversely affected members of the public may have a right to a public hearing if they object to the proposed development. A separate Surface Rights Board deals with matters of compensation if values can not be voluntarily agreed upon.

For open-access major regulated pipelines, public utility style commission approval is normally required for inclusion into the rate base and approval of the associated revenue requirements.

11. Canadian Implementation Plans

In Canada, oil and gas activities are regulated by the federal and provincial authorities. For the non-accord Canada lands, activities are regulated by the federal Government or, in the case of accord areas, by joint federal and provincial governments. For all other lands, activities are regulated by the respective provinces. Accordingly, the Implementation Plan for Canadian flaring reduction efforts is composed of a series of plans aligned with the respective legislative authorities.

Although other Canadian regulatory authorities are considering endorsing the Standard, at this time, the authorities that have endorsed the Standard are as follows:

- National Energy Board
- British Columbia Oil and Gas Commission
- Energy Resources Conservation Board (Alberta)
- Saskatchewan Ministry of Energy and Resources
- Manitoba Science, Technology, Energy and Mines
- Canada-Newfoundland and Labrador Offshore Petroleum Board
- Government of Newfoundland and Labrador Department of Natural Resources

The Canadian endorsing authorities represent approximately 99% of Canada's oil production and associated gas.

The following sections contain each jurisdiction's status and objectives. The order is the National Energy Board followed by the provincial and joint provincial-federal jurisdictions moving from western Canada to eastern Canada.

11.1 National Energy Board (NEB)

The NEB is an independent regulatory tribunal established in 1959. The NEB reports to the Parliament of Canada through the Minister of Natural Resources. The Board is a court of record and has certain powers of a superior court of record including those with regard to compelling attendance at hearings, the examination of witnesses under oath, the production and inspection of documents and the enforcement of its orders. The Board's regulatory decisions and the reasons for them are issued as public documents.

The NEB is an independent federal agency that regulates several aspects of Canada's energy industry. The NEB's purpose is to promote safety and security, environmental protection and economic efficiency in the Canadian public interest within the mandate set by Parliament in the regulation of pipelines, energy development, and trade. The main functions of the NEB include regulating the construction and operation of pipelines that cross international or provincial borders, as well as tolls and tariffs. Another key role is to regulate international power lines and designated interprovincial power lines. The NEB also regulates natural gas imports and exports, oil, natural gas liquids and electricity exports, and some oil and gas exploration on frontier lands, particularly in Canada's North and certain offshore areas. The NEB also provides energy information and advice, by collecting and analyzing information about Canadian energy markets through regulatory processes and monitoring.

The main functions of the NEB are established in the *National Energy Board Act* (NEB Act). The Board has additional regulatory responsibilities under the *Canada Oil and Gas Operations Act* (COGO Act) and under certain provisions of the *Canada Petroleum Resources Act* (CPR Act) for oil and gas exploration and activities on frontier lands not otherwise regulated under joint federal/provincial accords. The Board also has specific responsibilities under the *Northern Pipeline Act*. Facilities and activities under the COGO Act include Imperial Oil's Norman Wells production facilities, recent production facilities

in the Fort Liard area of the Northwest Territories and exploration activities in the Mackenzie Delta Region. In addition, Board inspectors are appointed Health and Safety officers by the Minister of Labour to administer Part II of the *Canada Labour Code* (CLC) as it applies to facilities regulated by the Board.

One of the federal oil and gas regimes responsibilities is for the conservation of oil and gas resources. The COGO Act allows for the cessation or suspension of the production of gas or oil if a waste of resource is occurring. For 2007, 0.185 BCM (6.5 Bcf) of associated gas was produced. Under COGO Act, waste includes the escape or flaring of gas that could be economically recovered and processed or economically injected into an underground reservoir. In 2007, the utilization rate of associated gas pursuant to the NEB's jurisdiction was 99.2 %. Most of the yearly associated gas production is used for operation of the facilities. The NEB will continue to maintain a high standard pursuant to the provisions of the COGO Act.

11.2 British Columbia Oil and Gas Commission

British Columbia's regulatory body, the Oil and Gas Commission, has been able to review and approve most planned flaring events. Industry activity levels have historically been manageable, enabling the Commission to take a hands-on approach to identifying areas for flaring reduction, including shutting in high GOR wells during plant shut downs and minimizing well test flaring volumes. With increasing oil and gas exploration activity, this is no longer possible.

For the past several years, the Commission has been conducting research concerning flaring reduction opportunities and reviewing the amount of flaring taking place in British Columbia, thus laying the groundwork for development of a flaring reduction strategy.

The Commission expects to develop and implement a flaring guideline similar to Alberta's Directive 060 by the end of 2007. The approach will adhere to results based objectives, where appropriate, and will draw from existing research and documentation, specifically, but not limited to;

- Energy Resources Conservation Board Directive 060 – Upstream Petroleum Industry Flaring, Incineration and Venting,
- Clean Air Strategic Alliance – Flaring and Venting Project Team reports,
- World Bank - Global Gas Flaring Reduction Partnership,
- OGC reports,
- Ministry of Energy and Mines and Levelton recommendations for BC Flaring Reduction Strategy.

British Columbia will be aiming to eliminate all routine associated gas flaring by 2010 – where routine associated gas flaring is considered gas that meets an economic threshold for conservation. This would mean that operators would be required to perform an economic analysis of all sources of continuous associated gas flaring and subsequently conserve any gas that shows a net present value greater than an established threshold.

Additionally, as part of the process for flaring guideline development, the Commission will be establishing appropriate evaluation criteria for flare reduction for all sources of flaring which, at a minimum, will aim to reduce the quantity of flared gas per unit of oil and gas production.

11.3 Energy Resources Conservation Board

The ultimate objective in Alberta is to eliminate all routine associated gas flaring and venting that is feasible to recover.

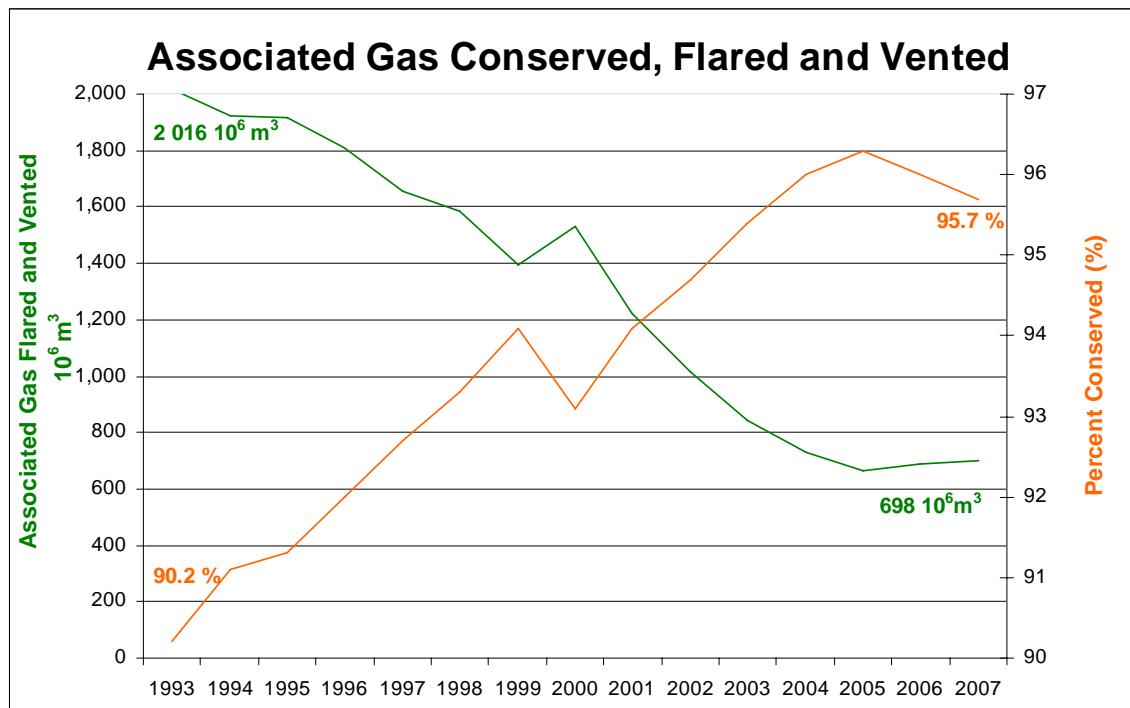
The Alberta Petroleum and Natural Gas Conservation Board, a predecessor to the ERCB was formed in 1938 by Alberta provincial government legislation, specifically to address a serious flaring problem at one of the early oilfields.

In spite of a long history of conservation and utilization, further reductions in flaring were not coming as quickly as desired in the mid 1990s and utilization rates were staying at approximately 91-92%. There were concerns about the impact of flaring on public health and animal health in addition to the concerns about wasting a valuable and premium fuel.

As a result, in 1996, a multistakeholder consensus-based approach was used to develop recommendations for flaring and venting management in Alberta. The Clean Air Strategic Alliance (CASA) developed a Flaring Project Team (later to become the Flaring and Venting Project Team) which included representatives for industry, government agencies and NGOs. This CASA Team is composed of representatives of Alberta Environment, environmental NGOs, the oil and gas industry and the ERCB. Using consensus principles, the Team worked toward recommendations which were supported by all Team members.

Not only was this approach to regulatory development unique, so were many of the novel recommendations that resulted from it. Among these was the use of voluntary flare reduction targets. The Team agreed on volume reductions and timelines that industry would be challenged to meet. Industry was provided the flexibility to pursue the ways it saw best to achieve these reductions. The regulator did not specify how the reductions were to be attained, but did provide a regulatory backstop. If the operators did not succeed in meeting the overall voluntary industry target, then the regulator would prescribe a requirement that was expected to deliver the results. In the end, industry outperformed the targets each year.

Figure 3 Alberta Associated Gas Conserved, Flared and Vented, 1993-2007



The ERCB was the recipient of the majority of these recommendations and used them to develop Guide 60 (now *Directive 060: Upstream Petroleum Industry Flaring, Incinerating and Venting*), its upstream petroleum industry flaring requirements.

Directive 060 requires that two key steps are part of the reduction efforts prior to any flaring or venting. The first step is to conduct a Decision Tree Analysis (DTA), as described in the ERCB's *Directive 060: Upstream Petroleum Industry Flaring, Incinerating and Venting*. The Decision Tree Analysis helps to determine whether there are options to flaring or venting the associated gas. It takes into account public concerns, potential health impacts, environmental impacts and economic alternatives, such as clustering of other flares/vents in a local area and electrical generation.

When the Decision Tree Analysis has been conducted and it has been determined in the DTA that other opportunities to conserve the gas are not feasible, an economic evaluation must be conducted to determine whether the associated gas is economically viable to conserve.

Further, the ERCB assures measurement of associated gas through two of its Directives. *Directive 017: Measurement Requirements for Upstream Oil and Gas Operations*, states how companies accurately measure associated gas. *Directive 046: Production Audit Handbook* states how, as a regulator, associated gas volumes can be confirmed.

Public reporting is done annually through a comprehensive public report ST60B: Upstream Petroleum Industry Flaring and Venting Report: Industry Performance for the Year Ending December 31.

11.4 Saskatchewan Ministry of Energy and Resources

Saskatchewan Ministry of Energy and Resources (Energy and Resources), on behalf of the Government of Saskatchewan, formally adopted the GGFR Standard for reduction of associated gas flaring and venting in November 2005. Energy and Resources believes that the current policies and regulations regarding the venting and flaring of associated gas in the province conform to the stated goals and objectives of the Standard.

The plan to implement the Standard in Saskatchewan incorporates a number of measures to increase awareness of the existing policies and the GGFR Standard. The plan includes the goal of clarifying or improving the existing rules and policies regarding associated gas flaring and venting in Saskatchewan.

The plan also involves working with industry and interested parties to ensure that industry best practices are being utilized, and encouraging new or innovative technologies or methods to reduce flaring and venting of associated gas in the province.

Operations of the oil and gas industry in Saskatchewan are regulated under the authority of *The Oil and Gas Conservation Act* and *The Oil and Gas Conservation Regulations, 1985*. It has long been a requirement of the regulations that any significant volume of associated gas that is not collected must be flared and not vented.

To clarify and strengthen this requirement, Energy and Resources has changed the regulations to place a specific restriction or limitation on the amount of associated gas that may be vented at an individual oil well.

The amendments to *The Oil and Gas Conservation Regulations, 1985*, which were finalized on June 19, 2007, requires upstream facilities, such as multi-well oil batteries, in the province to be licensed. The licensing process allows for closer monitoring of proposed flaring or venting at oilfield batteries.

Energy and Resources has taken a proactive approach to new facilities in particular, to ensure that best practices are utilized and that all regulatory requirements are being followed. In addition, conditions are being imposed on new well and facility licences placing limits on flaring or venting volumes.

Energy and Resources will work with industry and interested parties to find solutions to problems that may be preventing further reductions in associated gas flaring or venting.

For example, Saskatchewan provides research incentive grants to producers, for new or novel techniques or equipment with the potential to reduce the amount of associated gas flaring or venting.

Government of Saskatchewan will promote and help to co-ordinate the formation of regional airshed management associations in each of the oil and gas producing areas of the province. These regional airshed management associations are an excellent way to involve all affected parties in the process of finding answers to issues regarding associated gas flaring and venting.

Energy and Resources will report annually the flared and vented associated gas volumes in the province, in addition to the reporting of associated gas production volumes. Energy and Resources will also work with industry to improve the accuracy of both the total volumes of associated gas production reported, and the amounts reported as flared, vented or used for fuel.

11.5 Manitoba Science, Technology, Energy and Mines

Upstream oil and gas operations in Manitoba are regulated under the Oil and Gas Act. The Act provides for, encourages and facilitates the safe and efficient development, and the maximum economic recovery of the province's oil and gas resources, in accordance with the principles of sustainable development.

Manitoba Science, Technology, Energy and Mines is responsible for administration of the Act. In September 2005, the Department, on behalf of the Province of Manitoba, endorsed the GGFR. The Department will be the province's lead agency for monitoring and reporting on flaring and venting in Manitoba's upstream oil and gas sector.

In 2001, Manitoba introduced amendments to regulations under the Act that focused on the management of associated gas at oil batteries to protect workers, the public and the environment from emissions associated with flaring and venting. Key changes to the regulations included:

- adoption of Manitoba Ambient Air Quality Objectives and Guidelines for battery emissions
- evaluation of flaring and venting at existing batteries
- air dispersion modeling of battery emissions
- new flare design and operation standards
- new application requirements for batteries that focus on the management of associated gas

Under the regulatory changes, all existing batteries in Manitoba were re-permitted in 2002, after demonstrating compliance with air quality objectives and guidelines. The re-permitting program led to battery improvements that resulted in a 20% reduction in venting and improved flare performance.

Information Notice 02-1 entitled "*Interim Guidelines for Implementing Regulatory Changes Relating to the Permitting and Operation of Batteries*" outlines the province's flaring and venting objectives. Venting at batteries is to be reduced, and where practical

eliminated. Where continuous vent volumes are sufficient to support combustion, the gas should be collected and used as fuel or flared. The Notice also outlines flare system design and operating standards. A flare system must provide stable and efficient combustion of any gas directed to it.

In 2007, associated gas production in Manitoba was $23.2 \text{ } 10^6 \text{ m}^3$. Manitoba is now able to conserve a portion of its associated gas. As a result in 2007, 28% of the associated gas was conserved, 38% was flared, 16.3% was vented and the remaining 17.7% was used as fuel.

The Department will continue to work with Manitoba oil producers to encourage associated gas conservation. The Department will be reviewing the province's oil and gas regulatory and fiscal regimes to identify any potential barriers to gas conservation. The Department will also be working with other jurisdictions on the feasibility of interprovincial gathering and processing of Manitoba's associated gas.

11.6 Canada-Newfoundland and Labrador Offshore Petroleum Board

The Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) was established in 1985 as a joint federal-provincial authority to administer the provisions of the Canada-Newfoundland Atlantic Accord Implementation Acts. As a part of its mandate, the C-NLOPB focuses on gas conservation for each development plan and expects operators to examine appropriate methods to conserve gas once an oil field is placed on production. The C-NLOPB also approves and continuously monitors gas flare volumes for the Newfoundland and Labrador offshore area.

Currently, there are three development projects in operation within the Newfoundland and Labrador offshore area; Hibernia, Terra Nova and Whiterose. During 2007, 21.3 million m^3 of oil and 4.46 billion m^3 of gas was produced from the Newfoundland and Labrador offshore area.

Since production first commenced from the offshore in 1997, experience has demonstrated the tendency for high flare gas volumes during the early stages of oil production. Each of the projects has encountered problems related to the commencement of steady-state gas compression which has resulted in high gas flaring volumes during the early stages of production. While the C-NLOPB understands the issues related to establishing gas compression and has granted some flexibility around gas flare volumes in the early stages of production, operators are expected to make every effort to establish gas compression as early as possible and to continuously strive to reduce flare gas volumes.

For projects where gas compression reliability has continued to be a problem, the C-NLOPB has imposed production rate restrictions and operators are expected to reduce production rates accordingly when the gas compression systems are out of service. As a

result of the lessons learned related to gas compression system availability, the C-NLOPB also requires, where practical, that oil production installations be equipped with two gas compression trains.

The C-NLOPB expects all operators within the Newfoundland and Labrador offshore area to take steps to minimize flare gas volumes. Operators are also encouraged to develop flare management plans that strive for the reduction of gas flaring volumes down to background flare levels. While operators are given the flexibility to operate within set flare volume limits, the C-NLOPB also monitors flaring volumes and practices on a continuous basis to ensure that good flare management practices are in place at each of the producing fields. In the future, the C-NLOPB plans to meet with operators to examine best practices to further reduce gas flaring, including the potential to eliminate gas flaring from the pilot on the gas flare system.

11.7 Newfoundland and Labrador Department of Natural Resources

The Department of Natural Resources is responsible for the regulation of upstream onshore petroleum activities in the Province, including gas venting and flaring. All offshore upstream petroleum regulations are jointly created by the federal and provincial governments. The province's Minister of Natural Resources is the minister responsible for approving these regulations and the federal Minister of Natural Resources is responsible for the corresponding federal regulations.

In general, existing practices within the province are consistent with the Global Gas Venting and Flaring Reduction (GGFR) Voluntary Standard and the Department of Natural Resources formally endorsed the GGFR principles in September 2007. The department will consider these principles when developing new regulations or revisions to existing regulations. The department's approach to guideline development will draw from both the work done by the GGFR and Alberta's Directive 60: Upstream Petroleum Industry Flaring, Incinerating, and Venting.

The Department of Natural Resources will work with Newfoundland and Labrador onshore operators to find feasible alternatives to flaring or venting associated gas at petroleum drilling and production sites. In addition, the department will report annual vented and flared volumes as well as associated gas volumes produced for all onshore upstream petroleum activities.

The department will also encourage C-NLOPB to continue in the pursuit of best practices for operators in our offshore area