

**The Canadian Industry Program for Energy Conservation (CIPEC):the dynamics
of a 24 year partnership between government and industry**

Sub-sub-title: "A program for all reasons"

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Abstract

Since its inception in 1975, the **Canadian Industry Program for Energy Conservation (CIPEC)** has been a key element of the Canadian government's industrial energy efficiency efforts. At this time, Natural Resources Canada's Industrial Energy Efficiency Initiative (IEE). provides a focal point for a joint voluntary industry/government alliance to increase energy efficiency, limit emissions of energy-related greenhouse gas emissions and increase economic competitiveness. Key program outputs include energy efficiency improvement targets and action plans to achieve these targets at a sector and sub-sector level. Through a network of sector task forces supported by related vertical trade associations, CIPEC is a means of coordinating target and action plan development and implementation. CIPEC also includes the tracking and reporting of energy efficiency improvements and related emissions reductions as well as access to services designed to reshape and/or reduce marketplace barriers to the implementation of energy efficiency practices and programs within manufacturing and mining companies.

This paper will expand upon the above outline, highlighting how the initiative has adapted to significant energy and environmental policy changes since its inception.

Introduction:

This paper discusses the Canadian Industry Program for Energy Conservation (CIPEC): the Dynamics of a 24 Year Partnership between Government and Industry and the collective efforts of Canadian industry¹ and government to deal with a variety of industrial energy end-use issues. Specific areas of focus include:

Overview of Canada and Canadian industry

What is CIPEC - A historical perspective and an overview of the current structure;

What does it take to create a successful voluntary industrial initiative;What are the key elements of the Canadian voluntary industrial initiative;What has been achieved; and,What have we learned.

¹ For the purposes of this paper, the industrial sector is defined as Canada's manufacturing, forestry and metal/non-metal mining sectors.

Canada

Situated in the northern hemisphere, Canada is the second largest country in the world, with a land area of 9,221,000 square kilometres. Canada has one of the lowest population densities in the world because of its enormous size. With a population of over 30 million people, it is the thirtieth most populous country in the world.

Canada contributes only about 2% of net global anthropogenic greenhouse gas emissions. In OECD terms, Canada ranks second or third in terms of green house gas emissions per capita. Canada is a highly energy intensive country which accounts for its high per capita level of greenhouse gases. Indeed, energy production and consumption account for 98% of carbon dioxide emissions and 52% of nitrous oxide emissions.

Geography, climate, resources and economic development have played a large part in Canada's greenhouse gas emission levels. The large size and low population density mean that transportation needs are much greater than other countries. In terms of climate, Canada has no less than 11 distinct climate zones, accounting for enormous differences in degree days, hours of sunlight and the relative length of the various seasons.

Canada has the seventh largest industrial economy in the world. In 1998, the value of goods and services as measured by the GDP was \$73 billion (Canadian). Canada has a highly resource based economy. Canada is the world's largest per capita producer of nickel, copper, potash, gypsum, uranium, zinc, barley, industrial round-wood, sawn lumber and newsprint. It is also a highly export-based economy. Canada may be responsible for the production of relatively high levels of greenhouse gases but much of the production is consumed off-shore. Import-wise, Canada consumes many products which are much-less energy intensive, thus countries producing these goods are seen to have relatively low GHG emission levels.

Energy Supply and Demand

Canada has abundant supplies of conventional energy sources including natural gas, petroleum, coal, biomass, nuclear, and hydraulic. Energy is vital to the Canadian economy. Its reliable availability at reasonable cost has been a key factor in the attainment of a high standard of living and the development of industries with a particularly strong demand for energy. Energy makes up 6% of Canada's gross domestic product and 18 per cent of direct domestic investment.

Industrial Energy Use

Secondary energy use accounts for about 70% of total energy requirements in Canada. The industrial sector accounts for the largest share of secondary energy use (about 38%). In 1997, Canadian industry, as defined in the context of this paper, consumed approximately 2,682 petajoules of energy.

Energy use in Canadian industry comes from two areas:

- Process equipment consumption or equipment unique to a particular industry or sector; and

- Consumption from auxiliary systems which supply services to major process technologies during their operation. Examples of these technologies include lighting, ventilation, pumping and compression.

Energy use is fairly concentrated in the industrial sector. For instance, pulp and paper, mining and petroleum refining account for more than one-half of industrial energy use.

Energy costs are not major components of total manufacturing costs in many of the 10,000 Canadian manufacturing firms. On average, energy makes up 4% of production costs, with the exceptions being chemicals, primary metals, non-metallic minerals and paper and allied products where costs can be between 4% and almost 14% of the cost of production.

The Climate Change Challenge

In 1990, total GHG emissions were 599 million metric tonnes (Mt) carbon dioxide (CO₂) equivalent. NRCan's **Energy Outlook** projects that GHG emissions will reach 748 Mt in 2010, 25 per cent above the 1990 level. Put another way, by 2010, the gap between the reference projection and the Kyoto target would be some 185 Mt, suggesting that emissions would need to decrease 25 percent from the reference projection. This is obviously a challenge.

The Policy Framework for Canada's Involvement in Efficiency and Alternative Energy Programs

Canada has a strong interest in the encouragement of efficiency and alternative activities notwithstanding the fact that domestic and global energy markets are relatively stable. This continued involvement stems from the impact of energy production and use upon the environment. The production, transportation and processing of fossil fuels generates oxides of carbon, nitrogen and sulphur as well as volatile organic compounds (VOC). Emissions of these oxides and compounds contribute to acid rain, urban smog and climate change.

Canada has played a major role in emissions management, beginning with the Canadian Acid Rain Control Program in 1985. Further domestic activity involved the 1990 agreement in principle by the Canadian Council of Ministers of the Environment to develop a comprehensive 10-year management plan to control NO_x and VOC emissions.

Internationally, Canada has been involved in the global warming debate since 1988 when the Intergovernmental Panel on Climate Change was established under the auspices of the World Meteorological Organization and the United Nations Environment Programme. Canada was a signatory to the United Nations' Framework Convention on Climate Change in 1992 at Rio de Janeiro. Under the auspices of this convention, (the Rio Commitment), the federal government and the provinces developed plans to stabilize greenhouse gases at 1990 levels by the year 2000. On February 20, 1995, federal and provincial ministers of energy and environment approved the National Action Program on Climate Change. The NAPCC was subsequently tabled at the first meeting of the Conference of the Parties to the United Nations Framework Convention in Berlin. The NAPCC set out strategic directions Canada would follow in pursuit of its objective to stabilize greenhouse gas emissions as well as highlighting guidance for further actions

beyond the year 2000. Canada then signed the Kyoto Accord in December of 1997, committing to the more aggressive goal of stabilizing emissions at 6% below 1990 levels.

In 1990 Canada, as an outcome of the Second World Climate Conference, launched a vigorous domestic program for addressing climate change and other environmental problems. The Efficiency and Alternative Energy Program seeks to engage all sectors of the economy and the public in the matter of energy use. Relying on a variety of policy instruments such as information, persuasion, research and development and regulation, the EAE Initiative is designed to help the demand side of the energy market move toward more energy-efficient capital stock, production processes and operating practices without reducing the level of service or comfort that energy currently provides.

The program deals primarily with the partial or wholesale removal of barriers to the functioning of the marketplace including inadequate information, knowledge, financial constraints and institutional demands. It is very much a first step initiative to lay the foundation for longer-term responses that can respond to evolving environmental and economic development priorities. As such it has established an enhanced statutory authority, a more comprehensive data and analytical capability and a stronger information and planning framework with the provinces and other strategic allies.

Historical Perspective on CIPEC:

It is against the above backdrop that we introduce the Canadian Industry Program for Energy Conservation or CIPEC. The program was initiated in 1975 as a voluntary industry-driven program created in response to a rapid increase in energy prices and security of supply issues. Under this original structure, there were some 700 participating companies representing approximately 70% of the energy used by Canadian Industry.

The original organization structure was comprised of sector task forces, supported by their respective trade or technical associations and an active program of technology training and technology transfer directed at improving energy efficiency. The measurement of progress achieved was carried out internally by CIPEC with each participating company reporting on their year over year percent improvement on energy used per unit of output.

Between 1973 and 1990, the 700 participating companies achieved accumulated energy efficiency improvements of 26.1 percent per unit of output. This represents an average improvement of 1.6 percent per year and an ongoing reduction in carbon dioxide of some 30 million tonnes per year.

The Early CIPEC Initiative:

- (1) Established an infrastructure and communications network
- (2) Established a framework for setting energy efficiency improvement targets and for reporting on progress. The reporting system confirmed the validity of the approach and measure. As will be seen below, it also determined that an independent third party reporting system, accepted and agreed upon by all parties, was required.

Structure:

The current CIPEC builds upon past strengths and reflects the changing circumstances of the past quarter century. The first major change took place in the 1990-92 time frame when CIPEC was re-tooled to address a requirement for policy input from the energy consuming industrial sector in response to the increasing significance of global warming.

The national organizational structure was re-focused to include formal industry CEO participation through a CIPEC Executive Board with direct links to the Minister of Natural Resources Canada. A National Secretariat - external to NRCan - was also set up. The program still included industry-wide coordination through a Task Force Council as well as Sector -specific activities through sector-task forces and their sponsoring vertical trade associations.

In 1997, further enhancements were made. Following directions from the National Action Program on Climate Change, CIPEC was more closely aligned with the recently introduced Climate Change Voluntary Challenge and Registry Program (VCR). Upon the advice of industry, responsibility for activities and services of the CIPEC Secretariat were returned to Natural Resources Canada.

Program Structure

CIPEC includes an Executive Board, Task Force Council, Task Forces and a Secretariat.

Executive Board:

The CIPEC Executive Board includes Chief Executive Officers (CEOs) from the industry sectors served by CIPEC. The Executive Board carries out a number of activities including: negotiating industry-wide consensus on energy efficiency policies and programs; contributing to the policy-making process with respect to proposed energy efficiency performance standards, controls or targets; meeting with government Ministers on energy-related issues, and providing policy direction to CIPEC.

Task Force Council:

The Task Force Council includes the chairs of the various industry task forces, energy suppliers and invited government representatives. The Council coordinates energy consumption data collection and analysis on a sector basis; directs the activities of the industry task forces; develops policy in support of the Policy Board and provides direction to the CIPEC Secretariat.

Sector Task-Forces:

The Sector Task Forces are the heart to the CIPEC initiative. They include representatives from various industrial companies and their respective associations. The Task forces are charged with : identifying energy efficiency opportunities, reviewing and addressing barriers associated with these opportunities; and developing and implementing strategies for the realization of these opportunities.

National Secretariat:

The CIPEC Secretariat, operated through Natural Resources Canada's Office of Energy Efficiency, supports the activities of the Policy Board, CIPEC Council and the Task Forces. The Secretariat designs, develops and delivers a number of programs and services on behalf of CIPEC. These include: the commissioning of policy studies; the coordination of data collection and analysis; communications; and, a program clearinghouse on items such as energy efficient technologies and processes, project implementation, training, publications, research and development.

The linkage and information exchange between the Executive Board and the sector task forces is enhanced CEO participation enhancing, in turn, activity at the task force level.

What does it take to create a successful voluntary industrial initiative?

A successful voluntary industrial initiative does not just happen. There are many barriers that can slow down the participation and commitment of companies in a voluntary program. This paper will deal with what we feel are the top five: understanding; recognition of priorities; commitment; resources; and, timing.

Understanding

The issues surrounding Global warming are very complex and confusing - there are significant conflicting opinions about its relevance, cause, probable effects and solutions, coupled with sense that it is very difficult to make a contribution to resolving these issues. As a consequence it is difficult for many non-technical persons to understand what is required, and for decision makers in corporations the situation is no different. When understanding is limited there is a strong reluctance to act. As a result the required actions must be framed to clearly communicate the need for action and the message must be delivered consistently until an appropriate level of understanding is achieved.

Recognition of priorities

There must be recognition by all stakeholders that there are many priorities that must be balanced by corporations i.e. sales, profits, product development, health and safety issues, environmental regulations, cost containment or reduction, quality, growth, market share etc. Certainly energy efficiency improvement is part of most cost reduction strategies, particularly if the energy cost is a significant cost element, but to increase its priority in a business typically requires that this be at the expense of some other element. As a consequence the expectation to adjust the priority of energy usage to meet a national or governmental priority represents a difficult shift in thinking for most corporate decision makers and indeed a number of shareholders to which the CEO is ultimately responsible.

Commitment

The framework for a voluntary program requires a commitment to meet specific targets. This is generally a collective target by sector. Companies are not organized around assessing the requirements and implementing the activities required to meet objectives of the type associated with climate change. This is often a new experience for CEOs and there is serious concern about over committing corporate resources. As a result commitment requires a comfort level that is often slow to develop.

Resources

The measures that are implemented to improve energy efficiency and limit Greenhouse Gases are normally identified, developed and implemented by the technical resources within a company. The same technical resources are also required to address process development, capacity additions, health and safety issues, waste management concerns, quality assurance etc. These resource are limited and are carefully allocated based upon company objectives which can be a major constraint to developing a significant focus on energy efficiency. The capital resource is also constrained within corporations and while innovative approaches such as third party financing, are evolving, capital typically remains in short supply.

Timing

For major process industries, which are usually the large energy users, the opportunities for significant process improvements are typically linked to the next addition of capacity. While the technology to install a more energy efficient process is typically known, decisions on the replacement of existing operations usually cannot be supported by cost reductions resulting from energy savings. As a consequence the timing for improvement in energy usage is largely dependent on market growth. The opportunities for market growth are constrained by company specific and sector specific environments. Market growth opportunities are only coincidentally aligned with target dates agreed to by governments for the reduction of Greenhouse Gases.

Key elements of the Canadian voluntary industrial initiative

Leadership

CIPEC has benefitted from strong and effective leadership from both industry and government. The ministers of Natural Resources Canada (NRCan) historically and currently support the voluntary approach and within government have given the efficiency and alternative energy component a high priority and profile. The most recent example of this is the creation of the Office of Energy Efficiency within NRCan which serves as a government-wide focal point for issues associated with climate change. From industry, CEO's of major corporations have come forward and have committed to participate in the dialogue and deliver results. These industry representative are in turn providing the leadership in their industrial sectors to obtain participation from as broad a base as possible.

Communication

Communication - government to industry - occurs between the Minister and the CIPEC Executive Board. There is a direct dialogue presenting a consistent message of support for the voluntary initiative and the need for action, coupled with active participation from the Minister at high profile events to reinforce the message and develop understanding. Industry leaders have received the message and have developed an understanding of the problem and the need for action.

The communication with industry has been on several fronts. The active recruiting effort for participation in CIPEC has resulted in 21 sector task forces and includes the participation of 31 trade associations and industry groups representing over 3,000 companies. The linkage of improvements in energy efficiency to improvements in a

company's competitive position has provided an element of understanding for many companies that they can positively relate to.

Infrastructure

CIPEC has functioned since 1975 and although it has been restructured to meet the issues associated with global warming, the infrastructure (the organizational structure of CIPEC) was in place to address the challenge presented to industry. CIPEC was able to quickly deliver a prepared and informed audience to conduct a dialogue with the Federal Minister and in turn mobilize their respective industrial sectors to commit to reduce greenhouse gas emissions. The development of this infrastructure has taken time and continues to evolve.

Measurement

Once an objective is accepted and targets are set, it is essential to develop an agreement on how progress will be measured. The best measures are closely linked to the desired result. CIPEC, since 1975, has accepted energy used per unit of output as the measure that best reflects "success".

Under its initial form participating companies self-reported on a year-over-year basis, without due regard to consistency or quality of reporting. When CIPEC was reconstituted industry requested and the federal government agreed to establish independent, third party collection of relevant data through the federal statistical agency - Statistics Canada. Industry participants have been largely comfortable with the measurement system that would be used to report progress and, as a result, have been more willing to agree to targets.

The measurement system is a story in itself to be further elaborated by my colleague Vaughn Munroe in the session on energy efficiency benchmarking. We have gone from a situation of two parallel processes where program data did not conform to the official numbers to one where a common source of data is used for analysis, policy and informed decisions. Government and industry, in close collaboration, have expanded the sample size, allowing disaggregation to a 4 digit SIC basis, customized questionnaires to allow for differences in the energy forms for different sectors, and worked jointly to ensure a process whereby survey fulfillment is at or near 100% - unheard of in the past.

CIPEC Achievements:

Participation

At the close of the 1998/99 fiscal period there were 21 task forces participating in CIPEC, representing almost 90 percent of secondary industrial energy demand in Canada.

Energy Intensity Improvement and Emission Reduction

Thanks to the data tracking and reporting system, we have a high degree of confidence in stating the following. Since 1990, industry has posted an average annual intensity improvement of 0.9%, with stronger average gains since 1996.

The manufacturing and mining industries are making a strong contribution to Canada's international climate change commitments. Energy-use-related carbon dioxide emissions have increased by only 0.5 percent for the years 1990-1997. By comparison,

Canada experienced an overall increase in carbon dioxide emissions of approximately 12 percent for the period 1990-1996. Since 1990, GDP from CIPEC sectors has risen 17.2%, energy use has increased 10%.

These positive results are due to a number of factors: changes in industrial structure; investment energy efficiency investments and investments in new, more energy efficient, plant capacity, following the economic downturn of the 1990 and 1991, fuel switching and a greater use of electricity - especially important where non-fossil fuel electricity is available. Shifts in processes and in the nature and quality of manufactured goods.

It is difficult to quantify the impact of CIPEC on the above successes. We do know, however, that our solid dialogue with industry, in conjunction with our tracking and reporting system, has allowed us to gain a better understanding of how the industrial sector is functioning. In the future, we hope to have a better assessment of the program's impact.

Lessons Learned

If you choose the voluntary approach because it looks easy, simple and quick, you are in for a surprise. We have the benefit of more than 20 years of involvement with an industry voluntary program, experienced various levels of success and know how much effort it requires to get the participation and commitment to produce the necessary results. Through CIPEC, we have worked hard since 1992 to meet the challenge of reducing energy related carbon dioxide emissions and within this framework we still have more to accomplish.

It is essential that a market-based voluntary program such as CIPEC have the commitment of senior industry and government officials. Both sides must see the value-added that can be achieved through cooperation and through the implementation of energy efficiency opportunities.

By improving the efficiency of their energy use, companies can contribute to national environmental objectives while securing economic benefits. Increasing the productivity of their energy inputs will aid their competitiveness.

It takes time and an ongoing, constant dialogue to develop the necessary industry/government and industry-industry relationship that is represented by CIPEC. It takes the ability to listen and to respond to needs. It takes will and enthusiasm. We are privileged to have willing and enthusiastic volunteers involved in the program. Indeed, this extends from the board room to the shop floor.

In the final analysis, it must always be borne in mind that when it comes to decisions that will make energy-use more efficient, it is individuals, not organizations, who create success. Champions are an essential ingredient. It has been my privilege to work with these champions for the past 6-years. For the past quarter century, they have created an important legacy and model for others to emulate.