

A Position Paper Developed by the Alberta Energy Research Institute
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TECHNOLOGY CONSIDERATIONS for meeting the KYOTO PROTOCOL

Greenhouse gas (GHG) emissions are a concern for everyone, and everyone agrees they must be controlled. The issue for Alberta is that the Kyoto Protocols are not the best method for achieving this goal. The current Kyoto discussions have not put much emphasis on research and technology to reduce GHG emissions.

The Alberta alternative includes a comprehensive research and technology development program that will lead to long-term solutions for reducing GHG emissions without hurting the economy and without transferring funds outside of Canada.

The Kyoto Protocol requires that Canada reduce GHG emissions to 6% below 1990 levels or to 571 Megatonnes (Mt) by 2010. The forecast of probable GHG emissions by 2010 is estimated at 809 Mt. This means that Canada must reduce GHG emissions by approximately 240 MT over the next 8 years, a 30% reduction.

There are no known technologies available today that can accomplish this reduction.

There are some technologies available today and other technologies that will likely begin to come into use in Canada in the period to 2010, which will make energy available on a reduced emission basis. It is generally agreed that renewable energy technologies will have only a marginal impact on GHG emissions by 2010 and that for the foreseeable future, Canada will be dependent on a sustainable hydrocarbon economy.

The result is that the remedies available to Canada today are to deliberately reduce economic activity (especially energy developments), and/or buy emission credits from other countries at a cost estimated to range between \$1 and \$4 billion annually. The latter could, depending on how it is done, add an estimated \$1 to \$3 per barrel to the price of crude. Both alternatives would reduce growth, prosperity and opportunities for Albertans and Canadians, as well as reducing North American energy production at a time when security of supply concerns are increasing.

Research and technology development can provide an important alternative.

There is a large and growing body of research underway to develop new technologies that will allow significant reductions in GHG emissions. These include low emissions coal burning, low emission oil sands production and upgrading, capturing and sequestering of CO₂ in petroleum reservoirs and much broader applications for the fuel cell.

Research to reduce emissions on the scale that is required by Canada is at an embryonic stage and must deal with a variety of sources and emission producing mechanisms. Research of this nature is always a long-term undertaking requiring large investments. Such research takes 15 or more years to get new technology into commercial service. For example, the cost of CO₂ separation from coal-fired power plant is estimated at \$30 - \$40

per tonne using currently available technology. These costs do not take into account transportation and injection for storage. Clearly, dramatic breakthroughs will be required in the future to bring costs to a manageable level.

There is every reason to believe that research can produce the technologies required to reduce GHG emissions. The effort, however, must bring together four main ingredients: time, skilled research people and facilities, partnership between government and industry, and significant investments.

If Canada chooses to reduce its economy and/or to purchase emission credits, it will be a costly response and very likely an unproductive one. Canada has the proven ability to undertake leading edge research and to develop the required technology. However, reduced economic activity or paying billions outside Canada for emission credits will significantly impair Canada's ability to fund the necessary research and development. Worse, the payments will generally go to countries that have little incentive and less capacity than Canada to do the required such research. This means that the required technology will be slower to develop. In addition, Canada will have to spend more money outside the country either to buy "credits" or to buy technology to help reduce Canadian emissions.

Increased commitment to research and development is the permanent solution.

A more rational way would be for Canada – all Canadian governments and major research interests – to make an explicit commitment to reduce emissions, to develop requisite technology, and to set benchmarks for Canadian reductions based on realistic technological innovation, rather than using arbitrary reduction and date decisions. This could be done as early as 2015, not a long delay.

The Alberta Energy Research Institute has a long-term strategy in place to develop the required technologies. It works with partners in the private and public sector to achieve results – results that reduce the actual emissions instead of a paper transfer of emissions.

The concept of research credits provides the opportunity.

The commitment would include mobilizing Canada's innovation capacity on an incentive basis, to get as wide participation as possible. An idea to be considered may be the establishment of a comprehensive national research program to develop the technology specific to Canada's problem areas. The program should be leveraged through as much international collaboration as possible, including funding projects in other countries doing advanced research on emission reductions to help speed the availability of technology.

An important concept for consideration could be to develop an emission credit mechanism for new research investments to develop emission reduction technology. Canada should seek to have emission credits made available by international agreement for money spent on emission research and development.

The result: a significant contribution to world emissions reductions.

The results would be more money spent on innovation and faster availability of the required technology. This technology could then be made available to all countries in order to achieve actual GHG emissions reductions in more places faster than would otherwise occur. While there may be a small delay in reaching specific emission reduction targets in the early years, overall reductions would be achieved faster shortly thereafter. Canada would be able to play an important role in helping other countries adapt these technologies.

Key Messages:

- **Technology solutions required to meet Canada's targets under the Kyoto protocol will not be available in the Kyoto timeframe.**
- **The concept of emission credits for research expenditures targeted at GHG emissions should be considered. This would accelerate development of the solutions required for sustainable reductions.**
- **A commitment to research and development of technology will result in permanent solutions by 2015 – a 5-year delay from the Kyoto time limit.**