APPENDIX 1: ALBERTA ENVIRONMENT BACKGROUND PAPER

Developing An Approach To Setting New Standards And Performance Expectations For Alberta's Electricity Generation Sector

1. ALBERTA GOVERNMENT'S AIM AND OBJECTIVES

The overall aim of this approach is to improve the environmental performance of electrical generation in Alberta to demonstrate the province's leading role in developing and implementing integrated and sustainable energy development practices and policy. Specific objectives are to:

- signal to electricity generators Alberta's future expectations regarding air emissions from the electricity generation sector;
- deliver, over time, and in concert with technological advancements, progressive improvements in emissions-intensity from electricity generation;
- provide flexible and innovative opportunities for electricity generation and in particular, older generation, to improve their eco-efficiency, recognizing that there may be individual differences;
- maintain Alberta's competitive electricity market and provide a policy framework that does not disadvantage Alberta's electricity-export opportunities;
- allow for the development of new electricity generation to meet Alberta's growing electrical demand; and
- reduce environmental impacts.

2. KEY ISSUES

In developing measures that, in some cases, could require significant investments being made, a range of issues will need to be addressed by government, industry, and other key stakeholders.

2.1 Technical Issues

Which Emissions?

Although work related to emission standards for the electricity generation sector has been undertaken provincially and nationally, industry and government have identified a need for a more comprehensive approach to the development of standards. Such an approach would recognize Alberta's unique characteristics and also allow for greater integration of air issues. Current work includes the Multi-Pollutant Emissions Reductions Strategy (MERS) being undertaken at the national level covering mercury, particulate matter and ozone. Collaboration between government, industry, and stakeholders will assist in determining the level and extent of the air emissions standards to be reviewed and the sequencing of emissions to be addressed. It is intended that an integrated approach will be developed incorporating all air emissions (i.e., Criteria Air Contaminants and greenhouse gases).

With regard to greenhouse gas emissions from electricity generation, it is recognized that the vast majority is in the form of carbon dioxide (CO_2). However, to ensure any measure is complementary with international greenhouse accounting methodologies, it is considered that all greenhouse gases recognized by the Intergovernmental Panel on Climate Change (IPCC) should be included.

Coverage – *Existing Versus New Plant / Grid or Off-grid?*
To ensure equity and not discourage new electricity generation, it is proposed that standards would focus on the entire electricity generation sector in Alberta and include both existing and new electricity generation plants.

To ensure any standards are applied in an even, comprehensive, and consistent manner, it is recommended that they should also apply equally to both off-grid and grid-connected generation.

Size/Scale?
For reasons of efficiency and effectiveness, a minimum size or threshold to which any standards will apply may be required. This threshold will need to be determined in consultation with stakeholders.

Smaller electricity generation facilities (e.g., less than 20 MW) form a limited but growing percentage of electricity output. They are mostly gas-fired, or use a combination of gas and other fuels (including renewables) and are often co-located with industrial plants. On a plant-by-plant basis, they are generally less emission-intensive in terms of Criteria Air Contaminants and greenhouse gases than traditional larger electricity generation facilities. These smaller electricity generators could provide offsets for other generators if emission-intensity standards are implemented. This approach provides incentives and opportunities for additional energy-efficient electricity generation such as distributed generation to be added to Alberta's Power Pool.

Role of Technology Improvements
What role should technology play in improving performance? For some existing electricity generators, adopting current technologies could mean a significant financial investment moving beyond "no-regrets"[1] measures and may be perceived as creating inequities and financially disadvantageous given that other options may be available.

In deciding whether to adopt current technologies, it will be important to determine what is the appropriate role of standards (which may be technology driven) verses reducing emissions-intensity using other tools.

Form of Standards
The determination of appropriate efficiency-standards and the means of applying them is a challenging task as it directly relates to the level of effort and thus cost to meet them. Depending on the type of emission, there are a number of forms an emission standard could take.

- a single standard across the electricity generation sector that specifies a minimum emission intensity for a particular type of emission e.g. CO_2, SO_2. The emission intensity could be associated with an efficient technology and/or technological improvements;
- prescribing certain types or combinations of technologies which may be approved in Alberta;

[1] No regrets actions are those that result in emissions reductions and abatement, and which make good environmental and economic sense in their own right.

- an airshed capacity approach in which the capacity of an "airshed" with prescribed geographic boundaries is identified and within which concentrations of specified emissions must not be exceeded;
- a multi-pollutant emissions standard applied on a provincial, sector, or regional scale;
- a separate standard for each power plant in Alberta based on the fuel class and the optimum operational performance for that plant, as is the current regulatory approach;
- a corporate or multi-facility approach which would enable organizations with multiple generation plants the flexibility to achieve their emission intensity objectives by directing their efforts towards reducing emissions in a range of areas, and/or a combination of the above.

It will be important to ensure that the provincial approach to standards does not competitively disadvantage Alberta's electricity generators in the North American market and accordingly, the Alberta Government will work to ensure the national approach is consistent with this provincial initiative.

2.2 Implementation Issues

Any standards will need to be implemented in an equitable, transparent, and effective manner. For businesses competing in the Alberta and other North American markets, there will be a need to ensure that measures maintain the competitiveness of the electricity market and encourage efficient new generation. Accordingly, it will be necessary to have a sound understanding of the financial impacts on electricity generators and ultimately, to consumers. The financial impacts of the various standards will need to be clearly articulated to stakeholders and the public.

Role of Offsets

Offsets provide the opportunity to develop cost-effective responses for reducing net emissions. For greenhouse gases, actions could include, for example; biological removal approaches through agriculture or forest sequestration, reducing emissions at other existing facilities by adopting new technologies or improving efficiency through demand-side management. Offsets may be particularly relevant for electricity generation plants that may be nearing the end of their economic life and where refurbishment may be otherwise uneconomic.

Offsets do not however improve the emissions intensity of electricity generated from individual plants. Where retrofitting to meet standards can be achieved economically", then this may be the most appropriate course of action for an electricity generator to take to reduce its "net"[2] emissions.

Despite the promising opportunities afforded by offsets, the Alberta Government and stakeholders must address the difficult issue of how to validate offsets to ensure they are a credible environmental alternative to emission reductions.

[2] Net emissions imply that electricity generators can offset a portion of their emissions through the use of projects that remove greenhouse gases from the atmosphere or reduce anticipated levels of emissions.

Role of Emissions Trading

Emissions-rights trading systems have been used as cost-effective tools to manage air quality. Perhaps the best-known example of this is the sulphur dioxide emission-trading scheme introduced by the 1990 amendments to the US Clean Air Act. This program has been successful in helping electricity generators reduce the cost of controlling sulphur emissions to one-tenth of the minimum cost projected when the act was adopted.

Alberta's electricity generation sector experimented with a greenhouse gas emission credit trading system called the KEFI (Thousand Emissions Free Index) exchange to try to encourage higher emitting plants to purchase credits from lower emitting plants. A valuable lesson from the KEFI experiment is that emissions-rights trading cannot be successful without specific emission reduction objectives. A new approach to standards could provide an appropriate basis for emission-trading programs covering a full range of emissions.

Level of Management?

Emission standards could be applied at the provincial, regional, sector, firm, or facility level. Administrative effectiveness and the flexibility of emission management options must be considered in assessing how to apply standards.

Monitoring and Compliance

Once an appropriate standards approach is implemented, there will be a need to evaluate the program. This may include:

- a monitoring and reporting regime
- auditing
- review of the standard(s) and the program itself

It will be important to industry that any monitoring and auditing program does not impose an additional administrative burden and as such, where existing mechanisms exist or can be adapted, this should be investigated. Alternatively, existing regulatory and administrative requirements could be replaced provided there is no additional net cost or a reduction in administrative efficiency.

Incentives for Compliance

A measure of good policy is that it be both defendable and enforceable. Incentives and disincentives for compliance could become an important issue, as there is likely to be benefits and costs involved for business, particularly as the standards are tightened over time. It may be appropriate for government to provide an incentive for research and development that ensures appropriate technologies are available to address mitigation objectives. New technologies may provide foreign market opportunities for Alberta firms.

APPENDIX 2-POTENTIAL STAKEHOLDERS

Government
Alberta Environment
Alberta Energy
Alberta Energy and Utilities Board
Alberta Health and Wellness
Environment Canada
Municipal Governments

Non-Government Organizations
Environment NGOs
Health NGOs
Electricity Consumers
Climate Change Central

Industry
Electricity Generators
Electricity Retailers
Independent Power Producers
Power Purchase Arrangement Holders