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## **Summary of Papers and Proceedings from a Workshop on Key Issues in the Design of Carbon Management Policies and Regulations in Alberta, Calgary, January 27 & 28th, 2014**

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**Regulation commented on:** *Specified Gas Emitters Regulation*, [Alta. Reg. 139/2007](#)

### **Background and Format**

Largely because of its role as a global energy supplier, Alberta is the largest emitter of greenhouse gases among the Canadian provinces. In 2007 Alberta passed the *Specified Gas Emitters Regulation* (SGER), [Alta. Reg. 139/2007](#), which is due for renewal in 2014. The purpose of the workshop, Key Issues in the Design of Carbon Management Policies and Regulations, was to provide input to Alberta Environment and Sustainable Resource Development (AESRD) to assist in updating and revising the Regulation.

After consultation with an Advisory Committee, consisting of Jaclyn LaBerge (Trans Canada), J.P. Jepp (Shell), Don Wharton (TransAlta), Heather Carmichael and Justin Wheler (Government of Alberta), Janet Peace (Center for Climate and Energy Solutions), Nathan Maycher (Conoco Phillips), Tom Goddard (Government of Alberta), Andrew Leach (University of Alberta), Keith Driver (The Prasino Group) and Matt Horne (Pembina Institute), it was decided that the workshop would focus on: what can be learned from the current regulatory framework; international experience relating to offsets; the use of the Climate Change and Emissions Management Fund; the treatment of cogeneration; and overarching issues related to Alberta's role as a producer of both energy and greenhouse gas emissions.

The workshop papers were preceded by remarks from the keynote speaker, the Honourable Robin Campbell, Minister of Environment and Sustainable Resource Development. Following the Minister's remarks, Justin Wheler (Climate Change Specialist, Regulation and Mitigation, AESRD) gave a presentation on the first six years of the SGER. Then five commissioned papers were presented and discussed.

- Carbon revenue: Recycling versus Technology Incentives
  - Authors: Marissa Beck, Ph.D. Program in Global Governance, Basillie School of International Affairs, Wilfrid Laurier University, and Randall Wigle, Professor, Basillie School of International Affairs and School of Business and Economics, Wilfrid Laurier University

- Presenter: Randall Wigle
- Discussant: Len Coad, Director, Centre for Natural Resources, Canada West Foundation
- Offsets: Lessons Learned from the Clean Development Mechanism
  - Author and Presenter: Janet Peace, VP, Markets and Business Strategy, Center for Climate and Energy Solutions
  - Discussant: Keith Driver, Managing Partner, The Prasino Group
- Cogeneration and Carbon Management
  - Author and Presenter: Paula McGarrigle, Managing Director, Solas Energy Consulting
  - Discussant: Michal Moore, Area Director, Energy and Environmental Policy, School of Public Policy, University of Calgary
- Advancing the Integrity of the Climate Change and Regulatory System in Alberta
  - Author and Presenter: Christine Schuh, President, le-ef.com Consulting Corp
  - Discussant: Oliver Bussler, Director, Sustainable Development, TransAlta
- Leave it in the Ground?: Incorporating the Social Cost of Carbon into Unconventional Fossil Fuel Development.
  - Authors: Andrew Leach, Enbridge Professor of Energy Policy, Alberta School of Business, and Branko Boskovic, Alberta School of Business, University of Alberta
  - Presenter: Andrew Leach
  - Discussant: Simon Dyer, Director, Alberta and the North, Pembina Institute

**Keynote Address (Honourable Robin Campbell, Minister of Environment and Sustainable Resource Development)** (available [here](#))

The Minister's remarks concentrated on the goals of any changes to the Regulations, and on possible changes. The goals included: future regulatory stability, flexibility, short and long term emission reductions across industries, and working with other jurisdictions. Reflecting these goals, possible changes include: lowering the regulatory threshold to include smaller emitters, using differential emission intensity reduction targets for different categories of emitters, raising the levy, and enhancing collaboration with other jurisdictions, particularly in the area of offset supply.

During the discussion participants asked about the timing of the government's decisions and suggested that a white paper would facilitate public discussion of the proposed changes. There was also a question about the future of the carbon price. Would it be raised significantly, and would there be a ladder specifying its longer-term path?

### **SGER History (Justin Wheler)**

Alberta's *Specified Gas Emitters Regulation* (SGER) came into effect on July 1, 2007 and expires in September 2014. It covers large final emitters (facilities emitting more than 100 kt CO<sub>2</sub> e annually) (LFEs). The regulation is intensity based, requiring a facility to reduce its emissions by 12% of its baseline. A facility's baseline is historic. For new facilities, reductions

are phased in at 2% per year. There is a great deal of flexibility with respect to compliance options. Facilities can undertake onsite reductions. One of the onsite reduction options, cogeneration, is given special treatment. Facilities can purchase and retire offset credits from non-regulated projects. They can purchase and retire emission performance credits (EPCs) from regulated facilities that have been able to reduce emissions intensity beyond the required 12%. Finally, they may pay into the Climate Change and Emissions Management Fund (CCEMF) at a rate of \$15 per tonne.

The SGER reduces emissions by an average of 7Mt per year from business as usual. \$398 million has been paid into the CCEMF. Of that, \$213 million has been allocated to 51 clean technology projects. With leveraging from other sources, the total investment is over \$1 billion. The target emissions intensity reduction declared in *Albertans and Climate Change, Taking Action* (2002) was a reduction in emissions intensity by 2010 of 12%, or 20 Mt. This target has been realized through reductions under SGER which include EPCs, cogeneration and offsets.

Alberta's emissions profile shows that LFEs account for more than half of the Province's emissions. A variety of sectors are covered. Most sectors exhibit stable emissions, but oil sands emissions are growing. In a Canada wide context, Alberta has the largest and fastest growing CO<sub>2</sub>e emissions. Canada is not on target to meet its 2020 Copenhagen emissions target of 612 Mt (an absolute reduction of minus 17% of 2005 emissions by 2020). With current measures, it is projected to be 122 Mt. over target.

The successes of SGER include: significant emission reductions and investments in emission reduction technologies, improved quantification methods and data systems, a functioning offset market, a regulatory assurance system, and successful flexible management of a complex industrial sector.

Possible changes to the SGER include lowering the regulatory threshold, changing the \$15 price, changing the intensity target, and tightening or relaxing some of the compliance options. Lowering the regulatory threshold to 50 kt would bring 40% more facilities under the regulation and 16% more emissions. The 12% intensity reduction target drives the demand for compliance options, and the \$15 per tonne price is a major determinant of how expensive they can be. Because emissions intensity can vary considerably from year to year, the need for compliance options will also change. Overall, there has been a fairly even mix of compliance options used. Facility specific historic baselines add flexibility, but require considerable effort to establish.

Cogeneration does not fit well into the SGER, but the policy issues affecting it are not unique. Other facilities have multiple products, and offset projects, such as wind generation projects, also produce credits by displacing other generation and thereby avoiding the emissions associated with more carbon intensive forms of generation. The treatment of cogeneration is based on stand-alone alternatives for the two products, heat and electricity. There is no emissions intensity reduction target for electricity generation associated with cogeneration facilities. Emissions associated with steam generation are calculated as total emissions from the cogeneration facility net of emissions from electricity generation, where the electricity is assumed to be generated from a natural gas combined cycle electricity plant with a greenhouse gas intensity of 0.418 tonnes per MWh. The baseline for heat generation is a conventional boiler operating at 80% efficiency. As a result of this treatment, regulated entities that include cogeneration facilities allow the facility's emissions intensity to fall below its baseline emissions intensity and generate EPCs.

The conclusion is that SGER is working and achieving real reductions. Investments are being made to achieve future reductions. The Climate Change Strategy renewal and Regulation review is underway. Possible changes are reflected in Minister Campbell's comments.

### **Carbon Revenue: Recycling versus Technology Incentives (Marissa Beck and Randall Wigle)**

Since its 2007 inception, a \$15 per tonne levy paid in to the Climate Change and Emissions Management Fund (CCEMF) has been one of the options for compliance under the SGER. The CCEMF's purposes are to support the development and applications of new technologies to reduce emissions, and to improve Alberta's adaptation capabilities. Since 2007, about \$400 million has been deposited into the Fund, with about \$200 million allocated to projects.

Since any levy or tax on emissions results in revenue flowing to government, in Alberta's case into the CCEMF, the use of these revenues is an important consideration. This becomes even more salient if changes in the Regulation result in an increase in the levy.

Beck and Wigle first presented the options for the use of carbon revenue. These include the commonly recommended approach of revenue recycling under which revenues from a carbon tax are used to replace revenue lost when other more distorting taxes are reduced. Other options include the whole range of investments in new technologies, from supporting basic R&D to adoptions subsidies.

Revenue recycling provides what is known as the double dividend from a carbon tax. The first dividend is the carbon emission reduction, the second is that the harm caused by more distorting taxes, such as an income or corporate profits tax, is reduced when those taxes are reduced. For example, income tax reductions could be focused on lower income households, where it is most likely that a reduction in income tax would reduce harm by increasing work incentives and purchasing power. The benefits of revenue recycling can be substantial.

The benefits of supporting new technology are potentially very large, but can be compromised by the difficulties associated with picking winners, free-riding, and lock-in. Public investment in R&D should be focused on projects for which the returns to private investors are small. At the other end of the spectrum, adoptions subsidies may not be as effective as suggested by some of their proponents. Education funding for scientists and engineers is another option that is not always considered. Transparency and credibility are important characteristics of funding policies and, because technology development can be a long-term process, so is time consistency in both public sector funding and environmental policies. Funding decisions must both be, and be seen to be, impartial. Finally, a carbon tax should reduce emissions regardless of whether or not the funds are used to support technology. The role of technology support is to complement the emission reducing effect of a carbon tax, not to be a substitute for it.

The CCEMF's investments seem to have been focused on commercialization and technology push. More emphasis on early R&D would better address free-riding externalities. While the carbon tax itself constitutes a major incentive for adoption, adoption subsidies may still be worthwhile. Finally, revenue recycling, through allowing corporate tax cuts, could positively influence technology investments in the private sector.

The discussant, Len Coad, pointed out that revenue recycling versus technology support should not be viewed as an either/or choice. If we are to manage the changes required, we need to pursue both pathways. With respect to revenue recycling Coad suggested that redistributing the fees paid into the CCEMF by 106 LFEs to all personal or corporate tax-payers has allocation

implications that need to be further explored. British Columbia, which uses revenue recycling, has a much broader based tax, and a broader range of mitigation approaches. While picking winners (or losers) is difficult, Coad suggested that the CCEMC has a clear and careful process to ensure that the decisions it makes are based on scientific evidence, and not on who pays into the fund. The decisions won't necessarily result in emission reductions. Since the fund grows when emitters can't find ways to reduce their emissions, a technology fund at least helps to find ways to reduce emissions. Beck and Wigle's conclusion that the CCEMC has to date focused on demonstration and commercialization technologies, exposes a gap in innovation funding for more basic R&D.

The discussion focused on two issues: access to the CCEMF, and the types of projects funded. A member of the CCEMC Board emphasised that its approach is impartial and that it funds a broad portfolio of projects. Another participant suggested that, while revenue recycling is hard to apply in Alberta given the low revenue cap, it is worth considering as a longer-term strategy. There was a division of opinion in the room as to CCEMC's application requirements. Some found them very time consuming, expensive and cumbersome. Others took the view that the requirements were no more demanding than for any business proposal seeking financing.

### **Offsets: Lessons Learned from the Clean Development Mechanism (Janet Peace)**

In light of Minister Campbell's remark that enhanced cooperation with other jurisdictions may well take place in the area of offset supply, the Peace paper on the Clean Development Mechanism (CDM) was very relevant. Offsets schemes provide an incentive to reduce GHG emissions in sectors or countries that are not mandated by regulation to reduce. The motivation for reduction in an unregulated sector or country is that the reductions can be sold into the regulated sector to offset more costly emission reductions. The regulated sector creates the demand for offsets. The price for offsets, and the quantity supplied into the regulated market, depend on both the demand by the regulated market and the supply from outside that market. Limited demand, combined with a large supply, has caused the recent price for CERs (CDM offsets) to be very low.

While the offsets market may soon be expanded, regulated emitters in Alberta are currently constrained to use offsets generated in Alberta and thus cannot use CERs for compliance purposes. Regardless of their source, offsets need to be of high quality, constituting real, credible reductions. In addition an offset program must not impose unnecessarily high costs on participants (it must be efficient), and participants must have confidence that their investment will pay off. Peace addressed offset quality, program efficiency and participant confidence in the context of CDM with lessons for Alberta. Her presentation emphasised three themes: credibility, efficiency and certainty.

Offset quality requires a credible baseline. Under the CDM, the project developer identifies the baseline. It is made available for public comment, and then validated by an independent auditor. An important principle in baseline establishment is conservativeness, ensuring that emission reductions relative to the baseline are not overestimated. Once a project is validated, and implemented, a different auditor verifies that the emissions reductions have been attained.

An adequate supply of well-trained auditors is essential, and the incentives for these auditors need to be aligned with the objectives of the CDM. While the project developer currently retains and pays for the audits one suggestion is that auditors should be hired and paid for by the CDM Board, according to a pre-set fee schedule.

Program efficiency means minimizing the transaction costs associated with CDM projects without diminishing their quality. Standardization of baseline methodologies and verification procedures promotes efficiency, and aggregating many small projects can also reduce transaction costs (programmatic CDM).

The discussant, Keith Driver, reiterated the importance of rigour in supplying quality offsets, and of efficiency and transparency. He also emphasised the need for harmonization across jurisdictions and the sharing of best practice. The engagement of the unregulated sector, and reducing abatement costs, were both cited as important benefits provided by the inclusion of offsets in a regulatory system. Driver also emphasised that Alberta's work in developing offset protocols had gone largely unnoticed internationally, perhaps because of the unique features of the SGERs (baseline and credit and emissions intensity).

An issue that was raised in the discussion was that of using indirect emission reductions to create offsets, for example wind generation. This concern extends further into energy efficiency programs that reduce the demand for energy. Offset credits are assessed by specifying standard grid factors. Other issues raised in the discussion included validation and certification. One participant noted that Alberta's scheme does not make provision for project validation and asked whether this might be changed. Others noted that the absence of governmental certification of offset credits created uncertainty for purchasers as did the risk of retrospective changes in offset protocols. In response Peace suggested that the absence of certification might be a more significant obstacle to investment if the price of carbon increases; it may also be an obstacle in developing linkages with other jurisdictions.

### **Cogeneration and Carbon Management (McGarrigle)**

As pointed out in Justin Wheler's presentation, cogeneration accounts for a large portion of compliance under Alberta's SGER. Cogeneration is combined heat and power production (CHP). The SGER defines electricity as a by-product and does not impose an emissions intensity target on the electricity from cogeneration. The growth in cogeneration in Alberta has been driven by three main factors: regulatory changes, reduced cost, and demand growth. The regulatory changes include full retail competition and industrial site designation (ISD) under the *Hydro and Electric Energy Act*, RSA 2000, c. H-16 which allows sites to be billed for transmission services only on the difference between on-site generation and the on-site load. This reduces the ancillary costs associated with power generation. Federal tax changes allow accelerated capital cost depreciation, and special treatment under the SGER allows cogeneration to generate substantial emission performance credits. The growth of steam assisted gravity drainage (SAGD) in oil sands extraction has increased the demand for both heat and power, and improved the economics of cogeneration. For new capacity, cogeneration has a levelized cost below other power sources, but higher than Alberta's forward power pool price. While electricity deregulation and ISD designation have had a large impact in promoting cogeneration, the SGER seems not to have had a big influence. An important question raised by this presentation is whether cogeneration is really business-as-usual.

The discussant, Michal Moore, took a broader view of cogeneration. He stressed the related roles of economics, system efficiency, and long-term public policy in motivating cogeneration. He also stressed that the regulatory system needs to promote the integration of cogeneration as part of a carbon strategy. To promote cogeneration you need long-term, predictable, regional public policy.

The question of whether and how to provide credit for cogeneration came up in the discussion. While there is some level of discomfort in the way in which we recognize cogeneration it is clear

that cogeneration is less emissions intensive than on-grid power and therefore should be encouraged. This suggests the need for further consideration of the effectiveness and transparency of crediting for cogeneration.

### **Advancing the Integrity of the Climate Change Act and Regulatory System in Alberta (Christine Schuh)**

Schuh views the regulatory system as a management system in which the regulator establishes targets, ways of measuring the degree to which the targets are met, and a process for evaluating, reacting and updating. The goal of the regulated emitters is compliance with the regulations, and providing the data that documents their compliance. Verification and audits are part of the regulator's tool kit. Of course, the devil is in the details. Challenges to the existing system include: ensuring that the interests of the intermediaries who construct offset protocols and perform verification are aligned with the regulator; ensuring quality data through things like reviews, audits, accreditation requirements; ways of dealing with the inherent uncertainty in the system, including discounting, holding back or disallowing offsets; fungibility with other systems such as cap and trade; and baseline determination or additionality (project level or industry level).

The discussant for the Schuh paper, Oliver Bussler, pointed out that SGER has provided an impetus for the development of expertise in the regulated industries, among consultants, and in government. On the issue of fungibility he speculated on whether the era of economy wide emissions trading systems has passed. There are now a number of different systems (California/Quebec cap and trade, British Columbia carbon tax, the Regional Greenhouse Gas Initiative), raising the question of which system Alberta might wish to link with.

The discussion of the Schuh paper dealt with validation, training and education and the certification of personnel. On validation Schuh expressed the view that validation is most useful where there is uncertainty as to whether a project complies with the protocol. This becomes less important as projects become more routine. Participants emphasised the need for better training and education and perhaps professional licensing bodies so as to improve the quality of the application of carbon accounting rules and thereby provide assurance to investors and improve the overall level of confidence in the system.

### **Leave it in the Ground? Incorporating the Social Cost of Carbon into Unconventional Fossil Fuel Development (Andrew Leach and Branko Boskovic)**

The Leach and Boskovic paper looked at the influence of the SGER on the decisions of Alberta oil sands producers' decisions to develop a new project or not. Hence the title "Leave it in the Ground?" The authors find that the current SGER has very little effect on the costs of such projects or on the decision about whether to develop the project. The current SGER only taxes emissions from oil sands production (upstream emissions), not emissions from the downstream combustion of the product. The authors also find that increased stringency of the regulation and/or tax on production emissions would have little effect on the profitability of the oil sands projects. They include estimates by the U.S. Environmental Protection Agency on the social cost of carbon (SCC). The SCC is presumed to have some legitimacy as a measure of the damages from global warming. They find that the returns to oil sands projects are not greatly affected. In fact, the returns are robust to carbon taxes on production emissions of up to \$100 per tonne. Then they include a regulation or tax on combustion emissions of the resulting product applied in another jurisdiction and find impacts of far greater magnitude than the production only tax. This leads them to conclude that if we are worried about the future of oil sands projects, the coverage of carbon tax matters at least as much as the size of the tax. A change in the stringency of the

current Alberta framework which only applies to production emissions is unlikely to have much negative influence on oil sands projects. The real carbon risk for oil sands producers lies beyond the province.

The discussant for this paper, Simon Dyer of the Pembina Institute, provided some additional perspectives on the question considering both an SCC tax and other regulatory policies. How are such factors as catastrophic events, extinction of species, or the appropriate intergenerational discount rate, accounted for in the SCC? The SCC may be far too low. Perhaps what we should do is look at what SCC, or what regulations, are required to get on a path such as the IEA 450 scenario (International Energy Agency, *World Energy Outlook*, 2013). Dyer agrees that oil sands projects are likely to remain profitable under a strengthened SGER, and that it is likely to be stronger global climate policy that will most negatively influence the viability of such projects.

## Conclusions

Overall, the papers and proceedings of the Workshop are enlightening with respect to the successes of carbon policies and regulations in Alberta, and the challenges that remain. The successes include emission reductions and investments in new technologies that would otherwise not have occurred, improved measurement and data management systems, development of an offset market, and a functioning regulatory system. There is evidence that the system can be made considerably more stringent, without unduly affecting profits and competitiveness. However, this should be done in a way that provides a high degree of regulatory certainty for the future. This would mean a timetable for increases in fees and reduction targets so as to provide clear guidance to investors. Increased stringency is likely to mean more revenue for the CCEMF. This raises the questions of whether Alberta should consider revenue recycling as an option, and/or how to allocate support for the various technology fund options as revenue increases.

One of the challenges of the Alberta system is that it can be complex and opaque. This makes it difficult to manage and to assess effectiveness. The choice of a baseline and credit system (which focuses on emissions intensity on a facility by facility basis, and makes it necessary to deal with multiple products and indirect emissions), implies complexity. It also invites scrutiny of whether the establishment of project specific baselines reduces the incentive to adopt the most efficient technologies from the outset. The treatment of cogeneration is certainly opaque, and its effectiveness is questionable. Expanding the offset market seems attractive. Acceptance of CERs within the Alberta system may be seen as a contribution to international solidarity and engagement with the global community. Any decision to reduce the 100 Mt regulatory threshold must clearly weigh the benefits of doing so against the regulatory costs.

Regulatory systems in other jurisdictions will affect Alberta at some point. There may be a need for fungibility that will include more than offset markets. Since most other systems do not have a regulation that is both intensity and facility based, there will be some challenges. Even ignoring fungibility, the fact that Alberta's fossil energy exports create emissions whenever and wherever they are combusted, will mean that global regulations limiting or taxing combustion emissions will affect Alberta.

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