

Clean Electricity in Alberta

Thought Leader Forum Summary



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Disclaimer

This document is an independent report prepared as a summary of the Clean Electricity Standard Thought Leader Forum hosted in Edmonton on May 21, 2013.

The summary of the discussion is based on the notes collected at the forum and compiled by the authors, and not necessarily shared by an individual or organization that attended the event, nor of any individual sponsor.

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About the Pembina Institute

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The Pembina Institute is a national non-partisan think tank that advances clean energy solutions through research, education, consulting and advocacy. We have spent close to three decades working to reduce the environmental impacts of Canada’s energy production and use in several key areas:

- driving down energy demand by encouraging energy efficiency and transportation powered with cleaner energy sources;
- promoting pragmatic policy approaches for governments to avoid dangerous climate change, such as increasing the amount of renewable energy plugged into our electricity grids;
- and — recognizing that the transition to clean energy will include fossil fuels for some time — advocating for responsible development of Canada’s oilsands and shale gas resources.

For more information about the Pembina Institute, visit www.pembina.org.

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Introduction

Alberta's electricity system is responsible for half of the greenhouse gas (GHG) emissions from all of the electricity generated in Canada. While new federal regulations will require much of the existing coal fleet to retire over the next 20-30 years, there remain significant barriers to lower-emissions alternatives such as wind, solar, hydro, carbon capture and storage and combined heat and power systems. As such there has been an increased discussion on how Alberta can "Green the Grid".

On May 21, 2013, participants representing a wide variety of stakeholders assembled for the *Clean Electricity Thought Leader Forum* in Edmonton to discuss a specific policy concept designed to overcome barriers to low-carbon electricity investment in Alberta. In particular, participants reviewed a greenhouse gas emissions-intensity performance standard for the electricity sector, labelled a *Clean Electricity Standard* (CES), as well as specific mechanisms to help operationalize and implement such a policy.

A number of multi-stakeholder discussions relating to renewable and alternative energy policy have been undertaken over the last decade — the time in which Alberta has completed the transition to a deregulated electricity market. These discussions have thus taken place within the context of Alberta's unique electricity system and have probed potential policies for suitability to this context. Each stage has provided some platform upon which subsequent discussions have proceeded, informed by common understandings and shared perspectives developed in earlier forums. The development of the CES, as well as the discussions around it, have benefitted from this existing experience.

This history of discussion and development is further detailed in the white paper pre-read that was distributed to participants in advance of the forum, which provides more comprehensive background as a sister document to this final report. The pre-read, *Clean Electricity Thought Leader Forum: A Made-in-Alberta Proposal to Green the Grid*, further explains more recent discussions, including:

- the need to address barriers to investment in clean electricity development, particularly the volatile nature of Alberta's market electricity system and the related difficulty in attracting long-term financing for capital-intensive clean electricity projects;
- the 2010 *Power Wedges* Thought Leader Forum that found strong support for focusing on performance-based standards, while articulating certain rationales for not pursuing other policy options; and
- subsequent conversations that fostered the development of the CES concept, owing largely to broad preference for technology-neutral policy that employs Alberta's electricity market forces.

The pre-read also outlined the CES concept in greater detail. In essence, the CES is a GHG emissions-intensity standard applied to retailers, who must meet the intensity standard through their portfolio of electricity purchases. The pre-read also explains the appropriateness of the CES to the Alberta context and potential attractiveness to Alberta policy-makers, as well as the expected outcomes for clean electricity in Alberta (in particular, fostering interest in

bilateral financeable contracts for low- or non-emitting generation) and certain mechanisms that have been postulated to operationalize a CES in Alberta.

More detail on these aspects of background and context to the CES and to the Thought Leader Forum discussions can be obtained from the pre-read.

Participants and objectives

Seventy participants attended the forum representing members from stakeholder groups listed below:

- Government of Alberta
- Electricity retailers
- Electricity generators
- Project developers
- Renewable energy manufacturers
- Consumer groups
- Academics
- Non-government organizations
- Industry associations
- Consultants
- Oil and gas
- Municipalities

While the CES is not the only clean electricity policy tool available to the government of Alberta, concentrating on only one option for the day enabled more incisive vetting — including delving into greater detail about implementation — than discussions with numerous policy options have previously afforded. While the forum was intended to air, as comprehensively as possible, insights and concerns about the CES, as well as its potential obstacles and implementation solutions, ideas and concepts were also applicable to other potential options. The forum's discussions were also able to derive greater precision about the objectives, priorities and level of ambition for clean electricity policy in Alberta.

It is important to point out that a focus on the CES would invariably lend itself to critiques against it as the single policy option under discussion. It was not the intention in holding the forum simply to take aim at the CES concept, but to wield collective knowledge and experience to anticipate potential problems, then to derive solutions or mitigations where possible. It was always a possibility that concerns raised would lack solutions or only have mitigations with their own fatal unintended by-products, in which case they might prove to be showstoppers to the CES concept for either all or some participants. However, a working assumption of the forum's purpose and development was that some sort of policy to advance clean electricity in Alberta is necessary to address the barriers that prevent faster and more meaningful development of clean electricity and its benefits to the province's environmental performance and overall social licence. With this in mind, participants were directed to make critiques of this concept with a mindset for finding solutions or an alternative that would work better.

The forum sought input on six general topic areas relating to the CES and its implementation:

- a. Determining the priorities for a clean electricity policy in Alberta and whether and how a CES pursues such policies, particularly by comparison to other policy options
- b. Determining the key determinants and limitations for setting the stringency (mandated emissions intensity) of a CES
- c. Identifying and assessing critical interactions between a CES and other policies, in particular Alberta's central GHG policy, the Specified Gas Emitters Regulation
- d. Identifying unintended consequences of a CES and assessing their importance and potential solutions or mitigations
- e. Assessing the feasibility and importance of certain compliance mechanisms postulated to help implement the CES and ensure that retailers can meet the targets
- f. Identifying and assessing alternative or additional policies and their appropriateness to the Alberta context and to addressing the identified barriers to low-emissions electricity

Background to these topic areas, as well as greater detail around the particular issues to be probed, were provided to participants in advance as part of the pre-read document.

Forum format

The forum was a single, full-day event, and the agenda can be found in Appendix A. The forum started with welcome remarks by Ed Whittingham, Executive Director of the Pembina Institute, and an overview of energy priorities in Alberta by Mike Eklund, Assistant Deputy Minister with Alberta Energy.

Susan Carlisle, Alberta Energy's Director of Alternative Energy, discussed the department's progress and expected timelines and action with its "Renewable and Alternative Energy Framework". Tim Weis, the Pembina Institute's Director of Renewable Energy Policy, gave an introduction to the background of the process that led to the development of a Clean Electricity Standard, including an overview of some of the range of policy options in discussions in Alberta that have taken place over the prior decade. He also note, that under the current market conditions clean energy projects are difficult to finance and that the current trajectory for electricity emissions is unlikely to achieve government GHG targets.

The rest of the morning was devoted to a deeper dive into the details of the CES concept, with Paula McGarrigle of Solas Energy Consulting outlining the need for a clean energy policy in Alberta's market and how a Clean Electricity Standard can help to overcome market barriers to a low-carbon and diversified electricity mix. Dale Hildebrand with Desiderata Energy Consulting detailed how a CES could be operationalized in the Alberta marketplace, and the potential role for a Clean Energy Standard Agency (CESA) to manage and oversee the implementation.

After lunch, participants separated into breakout sessions to address the six specific topics outlined above. Two 45-minute sessions were held, each with 25-minute report-backs to the plenary. In each session, one of five topic areas were covered – topics a. to e., above, in the first session, topics b. to f. in the second. More detail about the topics and prompting

questions for the discussions were included in the pre-read, and facilitators broadly encouraged discussion within the three prompting questions arising under each topic.

Following the breakout sessions and report-backs, Ed Whittingham wrapped up the forum by facilitating a panel discussion of representatives from relevant industry associations, including the Independent Power Producers Society of Alberta, the Canadian Wind Energy Association, the Canadian Solar Industries Association and the Canadian Hydro Association.

The following chapters cover the feedback and discussions recorded from the morning plenary, as well as each of the afternoon breakout sessions, by topic area. Some topic areas include aggregation from two or more breakout sessions.

Initial responses

At the conclusion of the plenary morning information and explanation sessions, participants were invited to write down some initial reactions to what they have heard and what are the key advantages and disadvantages of the CES concept as presented and discussed in the white paper. Below is a simple recording of the unique pros and cons collected, in no particular order. It is important to note that many of the responses with the same point were collapsed into a single response.

Table 1: Initial group feedback on pros and cons of a Clean Electricity Standard for Alberta

Pros	Concerns
<ul style="list-style-type: none"> • Reduce GHGs • Achieving Alberta's GHG reduction targets • Technology neutral • Creates a predictable target for investment • Creates financeable agreements within market context • Incenting long-term uptake • Incenting long-term contracts • Electricity is low hanging vs. oilsands • Sets a long-term goal/vision for province • Good intention • Addresses retailer and not producer • Sending a price signal; visible • Fits within Alberta context (targets and intensity) • Recognizes early action • Raise public awareness around GHG and electricity generation 	<ul style="list-style-type: none"> • Disconnected from other sectors • Doesn't include oilsands • Bolder step needed for social license • Distributed generation not included • Will intensity-based approach get us where we need to go? • Complicated - violating KISS by adding another level of complexity • End use, such as electric cars, not part of the discussion • Upends current market • Unknown price impacts • Peak load challenges • Retailers won't go for long term contracts (too high risk) • Does CESA become a competitor? • Major capital generation (hydro) harder to access market • Incent new vs existing generation? • Nothing for energy efficiency • Deposit/refund system adds another

<ul style="list-style-type: none"> • Opens door/market to new players • Works within market • Makes public commitment to clean energy/social license • Is something (currently nothing) 	<p>barrier for retailers</p> <ul style="list-style-type: none"> • Demand could exceed supply (seasonal complication) • Political/public salability • Resilience in the face of economic downturn (holding PPA) or government change • Technology neutrality isn't good enough to get the reduction needed, nor ensure supply type diversity • Risk of double counting (SGER and CES) • Capacity of CESA to function • Gives an unfair market advantage to low GHG emitting sources • Self retailers risk of stranded assets if they are high emitting
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Session Summaries

As noted above, two 45-minute breakout timeslots were provided to address the six topic areas in facilitated sessions of smaller groups. More explanatory detail on the background to the breakout session discussion topics can be found in Section 4 of the adjoining whitepaper. To the extent possible, these notes attempt to capture and summarize the points raised during the forum without prejudice, and without presenting commentary or additional analysis in response. They do not necessarily reflect the opinion of any one participant in any of the sessions, nor do they necessarily reflect the majority opinion.

a. Priorities for a clean electricity policy in Alberta

What a clean energy policy should achieve

In the discussion about choosing priorities relevant to establishing a clean electricity policy, participants were first prompted to identify as comprehensive a list of objectives as possible, then to choose a few of the most pressing or important and to discuss whether and how a CES could achieve that prioritized objective. Two sessions were conducted at the same time, independently from one another.

As part of a brainstorming activity, several ideas were brought forward for objectives for a clean energy policy in Alberta. Effort was made to organize these objectives by major themes, with explanations of the nature and relevance of the themes in bullet point form below, derived from the discussions. The first five themes were prioritized independently in both sessions, suggesting some consistency in perceptions of importance, whereas the latter three arose in only one session. Finally, for some of the prioritized themes, discussions proceeded to the next level, which was to assess the CES for its aptness to this priority and what aspects of the CES were valuable for meeting the priority objective. This input is included as narrative after the theme lists.

Theme 1: Real progress on climate commitments

- Achieve real GHG reductions.
- Reduce GHG intensity of the electricity grid, in line with science-based targets (limiting temperature change to 2°C) and provincial and federal GHG limits.
- Be cost effective; prioritize the least expensive ways of reducing carbon emissions (lowest cost per tonne).
- Create clarity around GHG reduction policy and objectives.

On the one hand, participants identified that the CES policy concept provides a receptacle in which to define GHG intensity limits that can be targeted to meet science-based targets and/or governmental emissions targets. Moreover, it is particularly designed to do so at lowest cost, given that the private market remains responsible for efficiently producing electricity within the precepts of the emissions standard. On the other hand, participants expressed concern that the intensity approach of the CES does not reduce actual electricity sector GHG emissions — due to rising demand, some participants believed, it would only reduce the slope

of emissions growth. Moreover, under the compliance mechanism of deposits and refunds with the agency, there is risk that the agency will not, itself, be sufficiently funded to meet intensity targets, so that the intensity might not actually be met by the electricity system. To mitigate this, the payment amounts to the agency will have to be sufficient to allow the agency to foster enough generation to meet the targets and/or to dissuade retailers from exercising the compliance mechanism and failing to comply with the actual intensity standard.

Theme 2: Provincial leadership and social license for market access

- Help build social license for all Alberta products outside of Alberta.
- Tackle Alberta's high electricity sector GHG emissions as an opportunity to step up and show leadership on GHG reductions in Canada.

On this parameter, participants noted that, as a novel policy concept, the CES is a “made-in-Alberta” policy innovation that can provide a template for other jurisdictions, such that Alberta could act as a role model on GHG reductions in the electricity sector, particularly for market-based jurisdictions. It offers a way for Alberta to secure GHG reductions with broad flexibility on compliance for industry, to avoid economic impacts and difficulties. In this regard, the CES was seen to offer a unique opportunity on improving Alberta's image and facilitating social license for marketing Alberta resources.

Theme 3: Promoting renewables for more diversified and resilient grid

- Stimulate growth of no- and low-carbon energy technologies, to diversify from carbon-intensive sources in anticipation of a carbon-constrained future.
- Diversify Alberta's energy sources i.e. ensure a mix of generation sources.
- Support integration of renewables into the marketplace.

Participants noted the CES's appropriateness for fostering a certain level of diversification, or along certain parameters. In particular, it was advanced as productive for decreasing reliance on carbon-intensive generation, and fostering certain newer production sources, such as wind. However, there was concern that simply selecting projects based on the lowest cost, under the market's rubric, would lead to a limited number of supported generation types under the CES, particularly natural gas cogeneration and wind, leaving out other production sources that may be more expensive, such as solar power. Solar, it was noted, brings its own benefits for diversification, relative to wind, based on the time-of-day characteristics of generation.

Theme 4: Social capital and benefits

- Ensure and reflect local community interests and stakeholder buy-in.
- Improve and increase social (community) benefits from energy production: community develops increased understanding and participation in producing and managing energy.

Participants mainly expressed concern on this priority objective of ensuring social benefits and linking to community buy-in, noting that the CES's focus on the most competitive clean electricity options would omit support for small and community-based generation options. Concerned participants suggested an additional or complimentary community-based policy.

Theme 5: Reduce non-GHG pollution

- Reduce air pollutants emissions of electricity sector (not just GHGs) in short, medium and long term.
- Reflect full cost of electricity (i.e. include externalities).

Three additional themes were clear from the discussions, but only arose in one of the two discussions.

Theme 6: Market structure and dynamics

- Reduce emissions in a manner consistent with Alberta's fair, efficient and openly competitive market and the market objectives and design, and not be implemented so quickly as to shock the market.
- Ensure a level playing field and clear price signals, focusing on the policy clarity around electricity GHG policy that generators desire.
- Ensure that incentive remains to maintain appropriate amount of baseload, even in face of increasing variable green supply.

Theme 7: Administrative efficiency

- Transparent and predictable rules and regulations.
- Low administrative overhead.
- Reduce complexity by using existing government organizations.
- Be nimble enough to begin implementation quickly.

Theme 8: Financing and costs

- Address financing issues facing new generation investment, likely by fostering PPAs – though acknowledging that lack of PPA is a financing issue facing the entire sector.
- Avoid hindering supply growth and ensure prices remain reasonable for the consumer.

b. Setting a standard

Emissions levels and timeframes

Two sessions were held to advance collective thinking around the appropriate emissions intensity levels at which to set the CES and over what timeframe; referred to as setting the “X” (in tonnes of CO₂e per MWh, t/MWh). First, participants identified the potential objectives relevant to setting the CES stringency, then identifying potential technical, infrastructural and financial constraints limiting the stringency and the rate at which the stringency would increase over time. Finally, in light of this insight, participants were invited to offer appropriate 2020, 2050 and 2080 standards.

Participants identified nearly two dozen relevant environmental, economic and social objectives at play in determining an appropriate emissions intensity standard, which can be grouped into five themes as follows:

Objective 1: Governmental GHG reduction targets

- GHG reduction targets for electricity production established under the province's climate strategy (37 MT from "greening energy production" by 2050).
- Federal government's international GHG reduction commitments.
- Driving toward federal government's target of 90 per cent renewable electricity.
- Enable cities with GHG emissions reductions plans to achieve the assumptions or targets that they have set for their electricity usage.

Objective 2: Coordination with other GHG policies

- Federal GHG regulations for coal power, natural gas power, and for oil and gas extraction.
- Equal marginal cost of reduction across sectors.
- Electricity being "low hanging fruit" of potential Alberta emissions reductions, target more reductions from electricity than its "fair share" in reduction goals.

Objective 3: Goals for the electricity sector

- Targeting net zero emissions from electricity.
- Incent PPAs that are sufficient to enable generation developers to borrow capital.
- Achieving acceptable end-consumer costs (while recognizing that all new generation needs will increase costs).

Objective 4: Ensuring improvements over "business as usual"

- Needs to improve on natural gas combined cycle intensity early enough to avoid "lock in" of natural gas at the expense of zero-emitting sources.
- Improve upon the business-as-usual prediction for electricity as projected by federal coal regulations and IPPSA report.
- Improve upon AESO's long-term outlook forecast for emissions intensity of 0.45 t/MWh by 2032.

Objective 5: Other policy objectives

- Level that enables Alberta to demonstrate leadership, thereby fostering social license for Alberta and enhance energy reputation for province.
- Driving down other non-GHG air pollutants as a co-benefit.

Participants identified ten constraints limiting the stringency of a future CES and limiting the rate at which the stringency increases (the emissions standard declines). Again, these constraints can be grouped into categories:

Technical constraints

- Construction lead times for new generation sources – particularly large-scale non-emitting sources (e.g., 10 years for hydroelectricity; 13-20 years for nuclear).
- Slow coal phase-out schedule under federal regulations maintains large amounts of high-emitting generation.
- Obstacles in grid integration for non-dispatchable sources.
- Transmission infrastructure.

Social constraints

- Avoiding social resistance to change.
- Existing low level of public/political awareness of policy objective of clean electricity.
- Labour constraints and competition with oil and gas sector for labour.
- Maintain current price, avoid clean electricity being blamed for price increases.

Through both discussions in both sessions, there was broad consensus around a few basic objectives that can provide consensus principles from which to begin the discussion around setting the X. These include:

- There are very few strictly technical constraints – if the right policy environment is in place, with long-term signals (appropriate market signals announced at least 15-20 years in advance), this will support planning and investment for industry to meet the standard.
- High load growth provides large opportunity for new lower-emitting generation, meaning an opportunity to reduce intensity quickly, in spite of large high-emitting coal base load.
- CES should have an end goal of moving toward net zero electricity emissions, over time.
- This long-term trajectory should also plan for much higher electricity use because of electrification of, for example, transportation, heat and industrial processes, for sustained GHG reductions in the future.

With these objectives, constraints and principles in mind, participants offered initial thoughts on reasonable targets for the near- and long-term, prompted with 2020, 2050 and 2080 as markers for discussion. While there is some variation in suggestions, these provide some starting boundaries to guide future discussions. A sampling of the targets proposed are listed below.

2020 Target

- Guided by Canada's Copenhagen target: 17 per cent below 2005 levels
- 0.6 t/MWh
- 0.5 t/MWh

2050 Target

- 80 per cent below 2012 emissions
- 0.21 t/MWh (the approximate intensity created by a mix of half natural gas combined cycle and half non-emitting generation)
- 0.05 t/MWh
- 0.25 t/MWh, combined with a goal of meeting 40 per cent of Alberta's energy needs with electricity

2080 Target

- Net zero emissions
- 0.01 t/MWh
- 0.05 t/MWh, combined with a goal of meeting 55 per cent of Alberta's energy needs with electricity

c. Interactions with existing policies

SGER and federal electricity regulations

Participants in two groups brainstormed and discussed potential concerns relating to other existing policies, at any level of government. This session focused on Alberta's central climate policy, the Specified Gas Emitters Regulation (SGER), because there was a sense that interactions with SGER could prove more problematic than existing federal regulations. As such, there was a desire to probe this interaction further, to better understand the possible conflicts and identify potential solutions.

Nevertheless, participants started with a brainstorm of other policies that the CES could potentially impact or vice versa. In addition to the CES, participants noted several policies, mostly federal GHG policies, but also two provincial environmental policies:

- Existing federal coal power GHG regulations
- Forthcoming federal natural gas power GHG regulations
- Forthcoming federal oil and gas sector regulations
- Natural gas plant review amendments to the Appendix of the Canadian Environmental Assessment Act
- Alberta's Lower Athabasca Regional Plan (relating to non-GHG air emissions)
- Non-GHG air pollution regulations

However, discussions indicated that none of these policies brought major concerns about conflict with the CES. Participants also pointed to a non-Canadian policy, the California renewable energy credit market and carbon market, as well other prospective foreign or provincial carbon markets. However, participants did not see significant or detrimental interactions with these policies because the CES is designed to deliver "null power" with no obligation nor benefit and no associated tradable units.

As a result, the focus of discussion was directed at the potential interactions with the SGER, which prompted a robust dialogue. The core of concerns advanced relating to the SGER was around double counting and additionality relating to the GHG credits arising under SGER on the one hand and the emissions intensities reported to the CES administration on the other. Some participants expressed concern that there must be conflicts in the two regimes. However, some participants submitted that additionality is a non-issue in that the CES is more of system-wide measurement tool that operates independently from specific project-based additionality. Indeed it was argued that implications associated with additionality were more with respect to impacts on the grid average, operating margin, and build margin, which are used in calculating the displacement factor that is used to determine the amount of offsets a renewable energy project obtains for its generation. In this way, the role for offsets would diminish over time, given the lower displacement factor and reduced need for SGER credits to make low-emitting generation projects viable. It was discussed that the electricity displacement factor could be adjusted to account for the X and avoid double counting and additionality issues.

Still, there was clear consensus that even if double counting and additionality might be "non-issues" for the reasons put forward, the lack of clarity around implications was a significant

issue itself. In other words, the CES would have little chance of success unless these two issues were more clearly addressed as part of the design of a CES, with stakeholders understanding the justification for how they can operate in parallel.

For greatest clarity and separation between the potentially conflicting policies, at least one participant suggested removing offset creation from the electricity market. Participants noted, however, that the prospect of not having offsets associated with the electricity market carried benefits (avoiding additionality issue), but also critical risks, such as the lack of market flexibility for large non-electricity industrial emitters to reduce emissions through offset purchases, a problem that could be mitigated by linking to other carbon markets.

While the additionality and double-counting concerns raised significant discussion, several core conclusions were drawn from the overall discussions, based on wide agreement among many participants, relating to how the CES interacts with, impacts and/or complements the SGER:

- The SGER as currently designed is not achieving its goals, and a separate system around advancing low-carbon electricity, CES or otherwise, is needed.
- An increase in carbon price alone, unless significantly higher than existing or proposed (e.g. \$100/tonne), would not provide the necessary signal to the market and would still not necessarily address the challenges associated with securing long-term renewable power contracts.
- Any specific issues or challenges related to interactions with the SGER are surmountable through effective design of a CES or the next iteration of SGER. Adjustment to the electricity displacement factor could take into account the regulated CES so that no double counting or additionality issues arise.
- The core challenges associated with the CES are more around impacts to the market dynamics of the deregulation system (see, in particular, the following section on “Unintended consequences”) and not interaction with other GHG-related policies.

Whether the CES is integrated as part of the SGER, or whether a separate electricity market-related GHG policy is applied, is a matter of choice and design rather than a critical issue.

d. Unintended consequences

Uncovering potential stumbling blocks

Two sessions were held separately to think about and discuss potential unintended consequences from the CES that could pose stumbling blocks to its sustained and successful implementation. Over the two sessions participants identified more than 60 issues, though many overlapped. Most can be grouped around six broad themes, an exercise that was largely accomplished by the groups themselves.

By addressing a smaller set of themes, the groups were then able to identify and discuss solutions and innovations that could address or mitigate the concerns. As such, brainstormed ideas about unintended consequences are presented below, grouped by broad theme, with these initial ideas about solutions or mitigations immediately after each theme. The themes

are roughly ordered by the volume of concerns arising under the theme, as an approximate indicator of top-of-mind concerns.

Theme 1: Market disruption

Concerns in this theme vary widely, but relate broadly to worries about how the CES would function within the deregulated energy-only market and whether the CES in general, and the idea of a CESA collecting compliance deposits and investing in non-emitting generation in particular, would undermine or upset the proper functioning of the market. These include concerns that the CES, itself, would:

- Engender “re-regulation” based on price and portfolio intensity certainty, or otherwise create pressures away from the deregulated energy market
- Change overall market dynamics, eliminating or distorting build signals and creating more volatility in the pricing market, particularly as green generators impact the pool price and foster change in market behaviour
- Create a two-tier market, differentiating wholesale and resale
- Create a capacity market (with “green” the only consideration)

A couple of concerns were particularly raised relating to imposing new difficulties on retailers, including concerns that the CES would:

- Eliminate the ability of retailers to deal with competitive pressures
- Reduce choice by squeezing already thin retail margins
- Create barriers to entry for new retailers due to the upfront expense of CESA deposits and PPAs, undermining improved choice and competition in the market

Concerns about these market impacts arising particularly due to the envisioned function of the CESA include concerns that:

- CESA could in essence effectively become an “Alberta Power Authority”, contracting for generation or capacity, which may be at odds with the deregulated energy-only market. An alternative could be an expanded role for the Balancing Pool which already manages PPAs
- CESA would be relied on solely as the procurement body if retailers fail to agree on long-term contracts with developers
- Construction of an agency and process outside of the energy market itself having unintended long-term market effects (signaling, price incentives)
- Agency required to be a market player in procuring low-emissions capacity, inappropriately competing against those that it is intended to support in meeting the intensity standard

Participants had only limited opportunity to brainstorm and elucidate potential solutions or mitigations of these concerns. Some concerns at the forum relating, in particular, to CESA were alleviated when a rough approximation of 500 MW was given as the amount of capacity CESA would ultimately procure, which obviously depends, in part, on the extent to which retailers achieve compliance in-house as opposed to relying on CESA for compliance. This relatively small market participation allowed some participants greater acceptance that CESA would operate truly as a facilitator and not a public monopoly or competitor.

Another source of concern arose from the sense among some participants that so much focus was put on the policy need for long-term contracts for clean electricity that this itself has become the underlying motivation for the CES, as opposed to a means to a lower intensity in GHG reductions. A clear upshot was that communication associated with the implementation of a CES should emphasize that while it might enable long-term contracts, this is only a market-based means to the end of material GHG reductions. Therefore, one recommendation arising from the forum was to better communicate the basic rationale for the CES as a GHG reduction policy, as opposed to a mechanism for fostering long-term power purchase agreements.

Other participants focused their concern on the activities of the CESA and suggested simply implementing a GHG intensity standard and leaving it to the market, alone, to achieve it, without need for an agency.

Finally participants also looked to completely different policy mechanisms that avoid some of these concerns (though, perhaps, create others) like relying simply on GHG externality pricing or providing government guarantees to new non-emitting generation.

Theme 2: Public participation and public acceptance

A number of unintended consequences related to concerns about the long-term sustainability of a CES due to threats to public acceptance of the policy. Many, though not all, of these unintended consequences related to end-user costs, but all have some connection to a potentially unsupportive populace. Concerns included:

- Increase in electricity cost to consumers, either by the requirement to enter contracts with clean electricity providers or by the penalty paid (or deposit not recovered) for non-compliance.
- Because retailers cannot mitigate or absorb costs, there would be a flow-through to consumers.
- Too complex for consumers to understand what the public interest connection is that arises from their potentially increased cost, and too complex for political class to communicate.
- Price is likely to go up regardless (given the increased cost of all new generation investments) and CES may be blamed, given lack of clarity in being able to articulate the determinants of energy prices in Alberta.
- Concern that this type of price impact tarnishes renewable energy altogether, as the most direct relationship to consumer is price increase.
- General loss of credibility and approval for the electricity sector if the CES is seen as expensive, too complex and perhaps self-serving.

In a similar cost-increase thread, a couple of concerns related less to the direct impact on residential consumers and, instead, to Alberta's industry competitiveness due to higher energy costs.

In contrast, some participants noted that concerns about electricity price impacts are overblown, pointing to evidence that lower-GHG electricity in Alberta need not increase prices relative to business-as-usual, particularly where the policy mechanism harnesses market tools

for finding lowest-cost options. Moreover, it was noted that projects that secure financing more cheaply, perhaps as a result of a policy that fosters long-term contracts, actually create lower-cost generation projects.

Nevertheless, the concerns around electricity prices and their relationship to public acceptance of the CES were broadly and frequently articulated. A few solutions arose to address the unintended consequence of public opposition, whether from actual or perceived cost increases or other public relations concerns:

- Strong, authentic communication on the issues at hand and the efforts to address them
- Consumer education about impacts of electricity in the province and rationale for policy, as well as the expected impacts of the policy — must include both residential and industrial users
- Involve electricity end users in participating in and benefitting from the policy (or policy package) – this concept is further addressed in the alternative options issue, section, relating to micro-generation-specific policy
- Along with the CES, employ consumer protection mechanisms
- Provide more flexibility in compliance options, such as investing internally in Alberta in GHG reduction technologies for competitiveness

Theme 3: Missing the mark when setting the standard (“the X”)

Some participants expressed concerns that complications around modelling expected GHG intensities in the future and around the standard-setting process would lead to ineffective or inappropriate intensity standards. The concerns of unintended consequences were articulated as follows:

- A standard would be set that would lead to no change from business as usual – lack of an intensity standard that changes behavior
- This would lead stakeholders to question why the CES was ever developed
- Inability to balance low cost energy with encouraging innovation

Participants offered a few suggestions around process and communication for mitigating these concerns:

- Develop clarity and good process-design for setting the standard upfront
- Demonstrate that the reduction in intensity will be an iterative process, with clear process for reviewing progress and reconsidering long-term plans
- Undertake upfront analysis to forecast intensity improvements from retirements of high-emitting facilities from which to track the standard, then follow those retirements and reflect the changes in the intensity curve, which means stepwise reductions (at times of major retirements) rather than smooth curve
- Balance reduction in standard with considerations for availability of low-cost options, while also fostering innovation

Theme 4: Outliers and misfits in the CES policy scope

Participants put forth two main concerns about the scope of the CES and potential outliers that cause some complexity in ensuring comprehensive scope of the CES application to all electricity sources.

First, participants pointed to the fact that approximately 30 per cent of total power supply in the province is “behind the fence” (i.e., part of industrial operations that do not feed in to the grid). However, participants felt that, for legitimacy, and to avoid industries (particularly oilsands operators) “skirting” the CES by avoiding the electricity market and continuing generation based purely off lowest cost with no regard for GHG externalities, participants felt that this significant portion should be included as part of the CES. However, participants noted challenges with metering this supply for these purposes, as well as assigning GHG emissions from combined industrial processes. Participants recommended more consideration and research into how industrial-scale behind-the-fence operations could be metered “at the bus bar” and considered part of the electricity grid for CES intensity purposes.

Second, participants expressed concern about how the CES would apply to imports, wondering how the intensity of these imports would be considered and incorporated under the CES. Moreover, there was concern that low-carbon imports would have an advantage and concern about whether and how high-carbon imports could be excluded or penalized within the CES in order to facilitate meeting the intensity standard.

Theme 5: Missed opportunities to address broader energy system issues

Some participants observed either a broader range of issues with the electricity system or concerns with Alberta’s energy industries more widely, and have concerns that the focus on a significant policy effort like the CES would mean missed opportunities, which are perhaps unintended consequences of the CES. These missed opportunities are wide ranging and only loosely correlated to the theme, and include:

- The electricity system will still operate on an energy-only basis, failing to account for the benefits of transmission proximity and local load planning.
- Too “sectoral” thinking and may discourage Canadian Energy Strategy thinking and how the electrical system can help the oil and gas sector get social license to operate.
- A partial change in market structure (a band-aid) may limit ability to make broader changes to market structure.

Participants offered solutions to the sectoral isolation concern, such as allowing large industrial emitters to obtain compliance in their regulatory regime by investing in long-term contracts in the electricity sector, or mapping and communicating the connection points between GHG policies across sectors, to clarify the CES’s role in Alberta’s climate change and energy strategy.

Participants also identified another type of missed opportunities: policy gaps that failed to advance clean electricity more comprehensively. The same themes were discussed in the alternative options issue, and are included there.

Theme 6: Technical concerns arising from increased renewable energy development

Participants also identified a few concerns relating to technical issues that, they believed, could arise from increased deployment of renewable energy. This was not identified as a focus area for further discussion, so no solutions were brought forward. Participants provided a few different articulations of the following concerns:

- Increase in variable supply would lead to supply surplus events, lower pool prices, transmission reliability concerns and congestion and even service disruptions.
- The increase in variable supply would continue to require natural gas backstop, or require storage to address intermittency, but the policy does not directly address either.

Theme 7: Other miscellaneous concerns

Finally, participants put forward a number of other unintended consequences that were not easily grouped by theme and that were not the focus of the solutions discussions:

- Slow pace of shifting portfolios renders CES difficult to implement and ultimately ineffective in reducing GHGs.
- Could foster unwillingness to build without long term contracts (stalemate).
- Penalization of existing operators (with lack of options in which to make existing operations more favorable, e.g., GHG upgrades).
- Could drive momentum away from other essential GHG reduction policies (e.g., carbon tax).
- Draw attention to the fact that Alberta is such a high emitter and give opposition more ammunition against Alberta, while failing to achieve enough under this wedge to please opposition.

e. Compliance and operationalization

Creating the institutions needed in Alberta

Two sessions were held to discuss the concept of compliance and operationalization of the CES. Participants acknowledged during the session that the CES was designed to simultaneously achieve several policy aims, in particular:

- Fostering social license for energy development and export
- Cleaning the electricity grid
- Incenting new generation capacity through long-term power purchase agreements
- Remaining consistent with the Alberta deregulated market
- Achieving political acceptability

This served as background to a discussion around challenges related to the details of operationalizing the CES and, in particular, concerns that participants raised about the concept of the CESA in particular. Participants brainstormed a number of challenges to the CESA, including:

- Enabling / tracking / transparency of behind-fence power transactions — much of the Alberta power market for large industrial consumers takes place off the public grid, and getting access to this information in a standardized way that manages confidentiality appropriately would be challenging.
- Market distortion — creating a public entity that can enter into PPAs with some energy providers risks warping the market, establishing precedents and moving towards a mixed market (e.g. Ontario).
- Driving up cost of cleaner electricity options — as with the SGER, there is the potential that prices will converge toward that of the PPA on offer by the CESA (because why would you sell your 'credits' for less).
- Administratively complex — the proposed system would require a heavy and skilled layer of bureaucratic oversight, including in the management of deposits and refunds, which leads to administrative costs and undermines CESA's procurement mandate.
- Financial risk — the CESA could be exposed to significant financial risk (e.g. credit risk) from its operations and procuring clean electricity similar to the Alberta Balancing Pool.

Participants offered a few solutions to try to mitigate some of these problems:

- Allowing regulated parties who are below the portfolio target to sell the "credits" to other regulated parties, or to bank for use in later years
- Establishing credits for 'efficiency'/Demand Side Management efforts, and re-energizing efficiency initiatives in the province
- Establishing a 'clearing house' mechanism modeled on the CMHC, to participate in and underwrite lower-carbon transactions
- Splitting the market into larger and smaller players, and establishing separate frameworks. For large players, the current system may work or could be supplemented by a CES. For smaller players, it may make sense to re-regulate the market.

f. Alternative options

Two sessions were simultaneously held to consider alternative or additional policies that are necessary or appealing as complements or alternatives to the CES. This started by identifying policy gaps of the CES, as foundation for discussing policy measures necessary to fill these gaps. A number of these gaps, with potential solutions, have also been discussed in prior sections where they were also relevant, but are consolidated here.

In a brainstorming activity, participants generated the following list of policy gaps — relevant policy objectives of clean electricity policy-making that were deemed missing from the CES:

1. Engaging consumers in a positive and meaningful way to overcome problems of social acceptance with quick change and lack of awareness among the public of the policy objectives of clean electricity policy.
2. Supporting small-scale or decentralized generation and taking account of the economic benefits of generation near load (focus of CES will be on large-scale).
3. Incentivizing some renewable technologies to harness some degree of technology specificity and geographic specificity — the policy creates a system still directed

toward lowest-cost low-emissions generation instead of developing future options, failing to meaningfully diversify electricity generation and perpetuating the volatile price dynamic.

4. Facilitating long-term or large capital projects (specifically hydro), because retailers will choose short term solutions to meet standard.
5. Addressing grid reliability and grid stability, long-term comprehensive planning of grid infrastructure and the challenge of integrating increased renewable energy generation.
6. Limiting broader opportunities and flexibility (including in uptake of new lower-emissions technologies) if market becomes saturated with long-term contracts, locking into infrastructure that is targeted toward the near-term intensity standard (particularly, natural gas and wind generation) that limits scale of potential future emissions reductions.

A number of solutions were offered for one or more of these challenges:

- Linking CES policy to microgeneration policy (gaps 1, 2 and 3, potentially 5): linking the CES to popular and high-profile policies supporting widespread microgeneration uptake by consumers would meaningfully and widely engage residents and businesses, offering stronger understanding and education to foster social acceptance, while also satisfying the need for policy to advance small-scale and decentralized generation in Alberta. In particular, participants offered a couple of ideas:
 - Instead of operating the CESA revenue neutrally, could have dollars in the fund return to consumers through microgeneration support programs;
 - Ensure microgeneration's attributes (low-emissions, generation near load, etc.) are reflected in the pricing structures under the CES.
- Add prescriptive approaches for particular technologies (gaps 2, 3, 5 and 6): by targeting certain technologies (foregoing absolute technology neutrality), those renewable technologies that are less able to compete immediately can be advanced, better diversifying the energy mix and avoiding excessive infrastructure lock-in of today's lowest-cost technologies at the expense of the future's most promising potential emissions reduction technologies.

Closing

The forum provided an opportunity for numerous fruitful discussions, and the overwhelming feedback from the session was that it was a positive dialogue, whether or not participants agreed with every detail of a CES or its proposed implementation. These proceedings attempt to capture the discussion that has been advanced and ideas that have been tabled; they should assist any policy choice that the government of Alberta may consider through its Alternative and Renewable Energy Framework process.

In closing it is worth re-emphasizing that in the spirit of the conversation, the proceedings summarize as much as possible issues that were raised during the sessions without presenting commentary or additional analysis in response. Support, critiques and questions raised about the CES in particular should help to improve it as a policy approach, or be used

to inform any future clean energy policies to reduce emissions and improve the long-term sustainability of Alberta's electricity system.

The organizers would like to thank the participants for their candor and their time, and to the sponsors of the event for enabling the discussion.

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Appendix A: Forum agenda

Clean Electricity Standard Thought Leader Forum: A Made-in-Alberta Solution to Green the Grid

Date: Tuesday, 21 May 2013

Location: Salon 10, Shaw Conference Centre, 9797 Jasper Avenue Northwest Edmonton

Time	Event
8:30 – 9:00	Registration
	Setting the Stage
9:00 – 10:15	Welcoming Remarks <i>Ed Whittingham, Executive Director, Pembina Institute</i> Energy priorities in Alberta <i>Mike Eklund, Assistant Deputy Minister, Alberta Energy</i>
	Renewable and Alternative Energy in Alberta <i>Susan Carlisle, Director, Alternative Energy, Department of Energy</i> Policy Options and Developing a Solution for Alberta <i>Tim Weis, Renewable Energy Policy Director, Pembina Institute</i>
	Clean Electricity Standard 101
10:15 – 11:00	Introduction to a Clean Electricity Standard <i>Paula McGarrigle, Solas Energy Consulting</i>
11:00 – 11:15	Break
	Clean Electricity Standard 201
11:15 – noon	Operationalization to a Clean Electricity Standard <i>Dale Hildebrand, Desiderata Energy Consulting</i>
Noon – 12:45	Lunch
	How breakout sessions will work <i>Ed Whittingham – Topics, norms for discussions, sessions locations</i>
	Breakout Session 1 – Choose one
1:00 – 1:45	Priorities for a clean energy policy in Alberta <i>What a clean energy policy should achieve</i> Setting a standard <i>Emissions levels and timeframes</i> Interactions with existing policies <i>SGER and federal electricity regulations</i> Unintended consequences

	<i>Uncovering potential stumbling blocks</i> Compliance and operationalizing <i>Creating the institutions needed in Alberta</i>
1:45 – 2:10	Report Back
2:10 – 2:25	Break
	Breakout Session 2 – Choose different one (same topics)
2:25 – 3:10	Setting a standard <i>Emissions levels and timeframes</i> Interactions with existing policies <i>SGER and federal electricity regulations</i> <i>Uncovering potential stumbling blocks</i> Compliance and operationalizing <i>Creating the institutions needed in Alberta</i> Alternative options <i>Including microgen, funding incentives, etc.</i>
3:10 – 3:35	Report Back
3:35 – 3:55	Panel Discussion - What we heard today, What challenges lie ahead, Next steps <i>Ed Whittingham – Facilitator</i> <i>Evan Bahry, Executive Director, IPPSA</i> <i>Robert Hornung, President, CanWEA</i> <i>John Gorman, President, CanSIA</i> <i>Pierre Lundahl, Canadian Hydro Association</i>
3:55 – 4:00	Wrap-up and next steps



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