UNIVERSITY OF CALGARY

THE SCHOOL OF PUBLIC POLICY
SPP Communiqué

Volume 8 • Issue 11
August 2016

SPP Communiqués are brief articles that deal with a singular public policy issue and are intended to provide the reader with a focused, concise critical analysis of a specific policy issue.

The University of Calgary is home to scholars in 16 faculties (offering more than 80 academic programs) and 36 Research Institutes and Centres including *The School of Public Policy*. Founded by Jack Mintz, President's Fellow, and supported by more than 100 academics and researchers, the work of The School of Public Policy and its students contributes to a more meaningful and informed public debate on fiscal, social, energy, environmental and international issues to improve Canada's and Alberta's economic and social performance.

POWER PLAY: THE TERMINATION OF ALBERTA'S PPAs

Andrew Leach[†] **and Trevor Tombe**

SUMMARY

By now, any Albertans who follow the news are probably aware of something called a Power Purchase Arrangement (PPA). Up until a few months ago, the PPA holders — which included TransCanada, ENMAX, and Capital Power — were responsible for buying electricity from legacy power plants at pre-determined rates and selling it into the grid. But with power prices falling and costs rising, the PPAs are no longer profitable. So, early in 2016, they backed away from these arrangements and handed the money losing PPAs over to an entity known as the Balancing Pool. With the electricity bills of Alberta households and business in the balance, it's been a high-stakes dispute between the companies and the government ever since.

The government estimates losses to Alberta ratepayers may be up to $2 billion and alleges the regulations under which the companies terminated their PPAs are invalid. They're going to court to try and prove it. The companies counter with substantially lower cost estimates and point to changes in government policy as a permissible reason for termination.

How did we end up here? How costly will the PPA terminations really be? Given the importance of this issue, we cut through the politics and see what data has to say. There are three key pieces to the puzzle. First, in June 2015 the province strengthened rules around emissions from large industrial facilities. The new rules gave more ambitious targets to facilities and increased the charge on greenhouse gas emissions above their targets from $15 per tonne to $30. Second, in November 2015, the Climate Leadership Panel recommended leaving the price on emissions at $30 per tonne but changing the targets to treat all power producers

[†] Andrew Leach served as Chair of the Government of Alberta's Climate Leadership Panel in 2015. The Carbon Competitiveness Regulation, recommended by that panel, is one of the main policies discussed in this paper. Leach's role as Chair of the Climate Leadership Panel ended with the tabling of the report in November, 2015.

equally regardless of their emissions intensity. For coal, this was a big hit, and the industry was recommending — and hoping for — a better deal that they didn't get. Finally, and perhaps most importantly, electricity prices collapsed. Despite the fears of many, the new climate policies are unlikely to increase electricity prices. This makes it difficult for coal power to cover its now higher costs.

Overall, we find policy changes account for roughly half the drop in PPA values, while falling prices account for the other half. The good news for Albertans is the drop in value appears to amount only to $900 million, and since one of the PPAs is already owned by Alberta's Balancing Pool the real cost of these changes is closer to $600 million. All in, that amounts to about $2.25 a month for a typical household, but it will only show up if power prices remain very low. So, while there is a chance consumers will pay it, they will only end up doing so if they are saving far more on power.

The government of Alberta recently launched a legal case that may "be one of the more complex and high profile judicial review proceedings ever heard in the province."[1] The government suggests $2 billion is on the line, with direct implications for everyone who pays an electricity bill. At issue is whether some companies who sell electricity into Alberta's system can walk away from contracts to purchase power from legacy coal-fired power plants when profits dry up. They contend changes in government policy allow them to do so. The government counters that low prices are the real reason the companies are trying to walk away from their arrangements, and such losses shouldn't be socialized.

To unpack this high-stakes issue, some background is in order. Alberta's electricity system is unique in Canada. Unlike other provinces, there is no provincially owned power company and, since 1996, power generation has been a competitive market. Prices are set in hourly auctions with the lowest-cost power offers selected each hour to meet load. Generators in Alberta's *energy-only* market earn revenue only on what they produce and are not guaranteed a particular return on investment. As the system evolved toward a competitive market, the government looked to mitigate market power and honour promises of certain rates of return made to plants built under the previous system. To accomplish this, the government chose to split power production from sales for legacy power plants. Specifically, it created and auctioned off what are known as *Power Purchase Arrangements* (PPAs).[2] The holders of these PPAs have the right to sell power from certain power plants, earning what they can from the dispatch and sale of this power, and have an obligation to pay the power plant owner contractual amounts determined to ensure that the plant owners continue to receive their pre-deregulation rate of return. If the PPA owners can sell power at a profit, they keep it, and this is what gave PPAs value. Until recently.

Falling prices and rising costs have made many of the PPAs unprofitable, in particular those which apply to legacy coal power plants in the province.[3] The value of electricity sold is no longer sufficient to cover the payments that must be made to the power plant owners, creating large potential losses for those who hold the PPAs. The losses are due both to lower power prices and to the fact that emissions-intensive coal power is disproportionately burdened by carbon-pricing policies initiated under the former PC government and strengthened under the new NDP government. Instead of bearing those losses, the PPA holders have exercised an option to terminate their arrangements without penalty, which leaves an entity known as the "Balancing Pool" potentially on the hook. The Balancing Pool has only one role — to manage the PPAs — and flows-through proceeds from the initial and subsequent auctions of the PPAs as well as net revenue from PPAs still under its management to Albertans via a rider on power bills. (If you ever wondered what the "Balancing Pool Credit" line is on your power bill, now you know.) Of course, as money-losing PPAs are transferred to the Balancing Pool, that on-bill credit will shrink as

---

1 See Nigel Bankes, "Attorney General Argues That Backdoor Amendment to PPAs was Unlawful," University of Calgary, Faculty of Law blog (July 26, 2016), http://ablawg.ca/2016/07/26/ag-argues-ppas-amendment-unlawful.

2 For more, see Balancing Pool website, "Power Purchase Arrangement Information," http://www.balancingpool.ca/about-us/ppa-information.

3 The initial carbon-pricing system known as the Specified Gas Emitters Regulation began in 2007. Details are at Canlii, "Specified Gas Emitters Regulation, Alta Reg 139/2007," http://www.canlii.org/en/ab/laws/regu/alta-reg-139-2007. The recent strengthening of carbon policies under the new government are available at: Canada. Government of Alberta website, "Climate Leadership Plan," http://www.alberta.ca/climate-leadership-plan.aspx.

ratepayers pay for the PPA losses and may potentially change from a credit to a charge on consumers' bills. Enter the government's lawsuit.[4]

The government and many others take the view that the return of the PPAs is intrinsically unfair — they see those who have earned significant returns shifting expected future losses onto the electricity bills of Albertans using what the government has termed the "Enron clause." But it is perhaps not so straightforward. The termination provision in the PPAs provided an option that the owner can choose to exercise or not. In the same way that standard financial option contracts have value, this provision makes PPAs more valuable than they otherwise would be. Without some protection from the risk of government policy costs, the PPAs would have been unlikely to sell at all and, since the PPAs were originally auctioned off, the government should have captured the value created by the termination option. Indeed, the government collected roughly $3 billion from the PPA auctions, and would almost certainly have collected less if there was no termination provision.[5]

What is important to the government's lawsuit is the manner in which the conditions allowing the PPAs to be terminated were established. The PPAs themselves contain a clause (in Section 4.3(j), which reads (in part), "to the extent that a Change in Law...could reasonably be expected to render (the PPA) unprofitable to the Buyer … then the Buyer may terminate this Arrangement and shall not be liable for, nor entitled to any Termination Payment." As University of Calgary law professor Nigel Bankes describes it, "the overall intent of Section 4.3 is to hold the owner harmless from the consequences of any change of law," and to some degree, it does so quite well. He further notes, "it is hard to overestimate the breadth of this definition and the scope of the protection it offers an owner."[6]

While the PPAs do protect owners from consequences of any change in law, no matter how small or no matter if applied broadly across the economy, the clause as written provides protection only in the event that losses from changes in law render a PPA unprofitable. This is by no means complete protection. A ruling by the Alberta Energy and Utilities Board interprets the clause more broadly to provide for the costless return of the PPAs to the Balancing Pool if, "a Change of Law rendered a PPA unprofitable or *more* unprofitable."[7] This "change in law" clause effectively provides protection for the owners not only from

---

[4] The legal filing is at: Canada. Government of Alberta website, "Originating Application for Declaratory Relief and Originating Application for Judicial Review," Court File 1603 13041, filed July 25, 2016, http://www.alberta.ca/documents/PPA-Originating-Application-2016-07-25.PDF. For recent news coverage, see: Chris Varcoe, "Blame game heats up as province heads to court over unprofitable power contracts," *Calgary Herald*, July 26, 2016, http://calgaryherald.com/business/energy/varcoe-blame-game-heats-up-as-province-heads-to-court-over-unprofitable-power-contracts. To be clear, PPAs can be terminated for any reason if the PPA holder pays the balance of its obligations to the power generator. At issue is whether a change-in-law provision within Section 4.3 of *Power Purchase Arrangements Determination Regulation*, Alta Reg 175/1997, as amended by Alta Reg 215/2001, allows them to do so without penalty because a change in government policy has rendered the PPAs "more unprofitable."

[5] The $3 billion is an estimate by Capital Power, reported at Capital Power website, "Capital Power responds to Government of Alberta's litigation seeking to reinstate Power Purchase Arrangements," news release, July 25, 2016, http://www.capitalpower.com/MediaRoom/newsreleases/2016/Pages/25-07-2016-2.aspx.

[6] For Professor Bankes' detailed legal analysis of the PPAs and their termination, see Nigel Bankes, "The Termination of Power Purchase Arrangements in Alberta: What is the Legal Position and What are the Implications of Termination?" University of Calgary, Faculty of Law blog, March 24, 2016, http://ablawg.ca/2016/03/24/the-termination-of-power-purchase-arrangements-in-alberta-what-is-the-legal-position-and-what-are-the-implications-of-termination/.

[7] See AEUB Proceeding 990277 obtained via University of Calgary, Faculty of Law blog, http://ablawg.ca/wp-content/uploads/2016/03/ppa-clarification-document-1.pdf.

losses resulting from a change in law but from any economic losses occurred as long as there has been a change in law affecting their costs at some point. This near-complete downside protection is much broader than protection from losses due to government policy, and our results will show the impact of that distinction clearly below. In its lawsuit, the government is contesting the legal standing for the latter amendment to the interpretation of the PPAs.

Regardless of the eventual outcome of the government lawsuit, with so many PPAs terminating around the same time, in addition to other uncertainty in the electricity market, many Albertans have questions. We hope to shed some light on how we got here, how much policy matters relative to other factors, and what risks Albertans face as a result of these changes.

We find that there are three pieces of the PPA-termination puzzle. First, we look at the role of new carbon-pricing policies announced in June 2015, which imposed new costs on coal-fired power plants. Second, we ask why the PPA holders waited until long after the June 2015 policy change that many point to as the reason for termination.[8] We argue that the announcement, months later, of the Climate Leadership Plan in November 2015 was crucial because it made it clear the government was not going to implement industry proposals, which were much more advantageous, and instead introduced new policies that added future costs to coal generation. Finally, and perhaps most importantly, prices have dropped — a lot — challenging the economics of the PPAs. These price changes combined with policy changes in June and November 2015 in a way that ultimately led to the PPA terminations. We explore each piece of the puzzle in detail below.

THE FIRST PIECE: STRENGTHENED SGER

Carbon pricing in Alberta started under the former PC government in 2007. That year, the government introduced a system — known as the Specified Gas Emitters Regulation (or SGER) — whereby large industrial emitters would be charged $15 per tonne of CO2 emitted over a certain threshold. That threshold was based on a targeted improvement in a facility's emissions intensity (emissions per unit of output). All in, the effective cost for a typical coal producer was just below $2 per MWh.

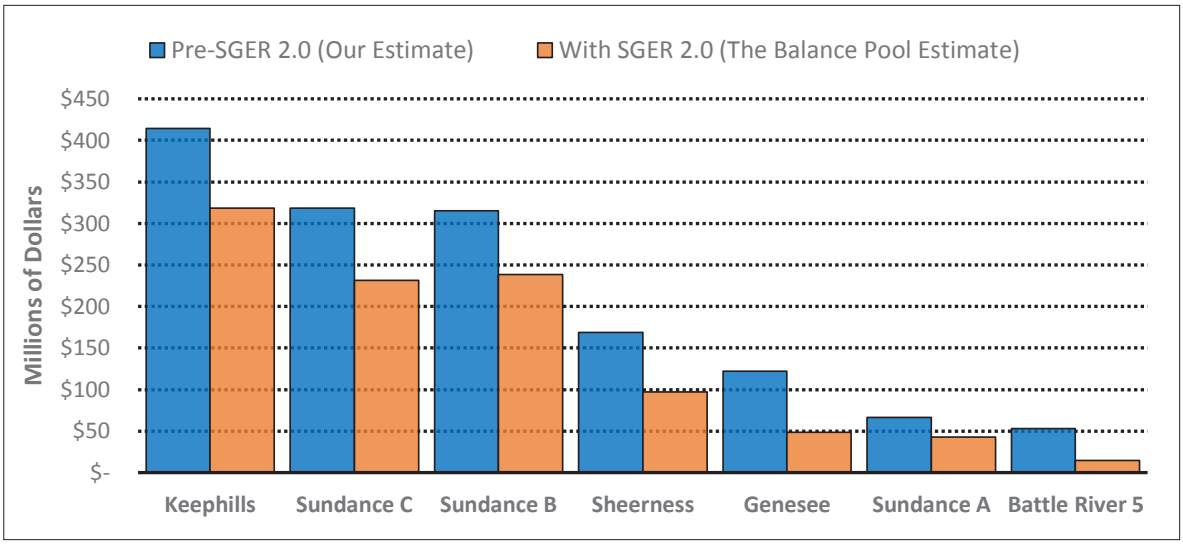
In June 2015, the new NDP government announced changes to SGER. First, it increased the amount of emissions subject to the price by tightening the emissions intensity target from 12 per cent to 20 per cent. Second, it increased the charge for emissions over that target from the 2015 value of $15 per tonne to $20 per tonne in 2016 and $30 per tonne in 2017. These changes would increase the cost of operating a typical coal-fired power plant by approximately $4 per MWh from 2015 to 2017. (We will refer to this strengthened SGER system as SGER 2.0.)

The PPA owners who have returned their PPAs to the Balancing Pool cite this as the "change in law" that allows for cost-free terminations, but it's not clear that this particular

[8] For the timing of PPA terminations, and the Balancing Pool's response, see Balancing Pool website, "News Releases for 2016," http://www.balancingpool.ca/news-releases/news-releases-for-2016.

change in law rendered the PPAs unprofitable at the time it was implemented. In September 2015, the Balancing Pool estimated the value of each outstanding PPA after the policy changes in June and found that after the new policy costs were factored in, *every* PPA had a positive value.[9] We plot the estimated values below.

FIGURE 1 THE VALUE OF ALBERTA'S PPAS, AS OF SEPTEMBER 2015



Note: Displays the net present value, between 2016–2020, of each PPA as estimated by the Balancing Pool in September 2015 and our own estimate based on if SGER 2.0 had not occurred. Uses a rate of 10 per cent to discount annual PPA values.

With positive PPA values, there would be little incentive for the owners to terminate. Why give up something of value? Of course, PPA holders might have estimated their own values differently than the Balancing Pool, but at least some holders were publicly supportive of the SGER 2.0 change. Capital Power, for example, expressed strong support the day of the announcement, calling it a "milestone in the development of an enhanced climate change strategy" and noting "the increase in the company's compliance costs will be partly mitigated by higher wholesale power prices."[10] We will examine whether prices behaved as expected shortly, but first turn to another potential policy-related explanation for the delayed PPA terminations.

THE SECOND PIECE: WHAT THE CLIMATE PANEL DID AND *DIDN'T* DO

A likely reason for PPA owners not terminating earlier in 2015 relates to the unknown (at the time) nature of further changes to carbon policies in Alberta. As the PPAs' "change in law" provision does not have an explicit time limit, and the PPAs remained in the money in the fall of 2015, there was little cost for the owners to wait until the province's Climate

[9] The Balancing Pool estimate was released through a freedom of information request made by the Wildrose Party (Alberta's official Opposition). The document is available online at: https://gallery.mailchimp.com/dc8b79f336d3436848d081928/files/Doc1.pdf.

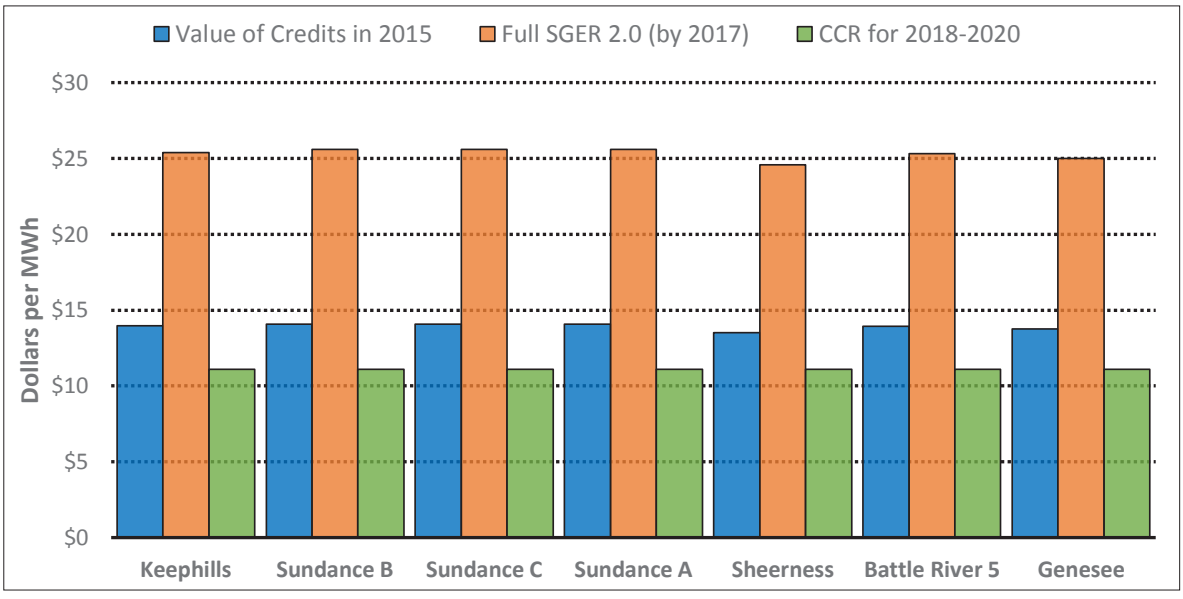
[10] For Capital Power's full June 25th press release, see Capital Power website, "Capital Power provides update on the impact of changes to Alberta's greenhouse gas reduction program," June 25, 2015, http://www.capitalpower.com/MediaRoom/newsreleases/2015/Pages/06-25-2015.aspx.

Leadership Panel reported later in the year. When the panel did report though, it had important implications for the PPA termination decisions — not just because of what the panel did, but also because of what it didn't do.

In November, the Climate Leadership Panel report recommended a change in the framework by which carbon prices would be applied to power generation. The recommended Carbon Competitiveness Regulation (CCR) was adopted by the government and would see all electricity producers receive free emissions credits (or, output-based allocations*)* at the emissions rate of the province's most emissions-efficient natural-gas generator. This change affected coal power the most since, under the original and modified SGER programs, coal producers would effectively receive credits based on 88 per cent and 80 per cent respectively of their *own* historic emissions intensity for free in 2016 and 2017, and would only pay the carbon price on approximately 12 per cent, and subsequently 20 per cent, of their emissions.

Under the CCR, coal-fired power plants would receive credits for just over one-third of their emissions, leaving them with a substantially higher average cost of electricity production. This is important to note — both SGER 2.0 and the new CCR policy price carbon at the same $30 per tonne, but because coal plants receive the same number of output-based emissions credits as other sources of generations – and thus far fewer than they had received under SGER – average costs of coal-power generation will be higher under the CCR than under SGER. We illustrate this in Figure 2 as the implied dollar value of the "free" emissions permitted under SGER 1.0, SGER 2.0 (by 2017), and the new CCR. The differences are stark.

FIGURE 2 THE VALUE OF FREE EMISSIONS PERMITS, BY PPA

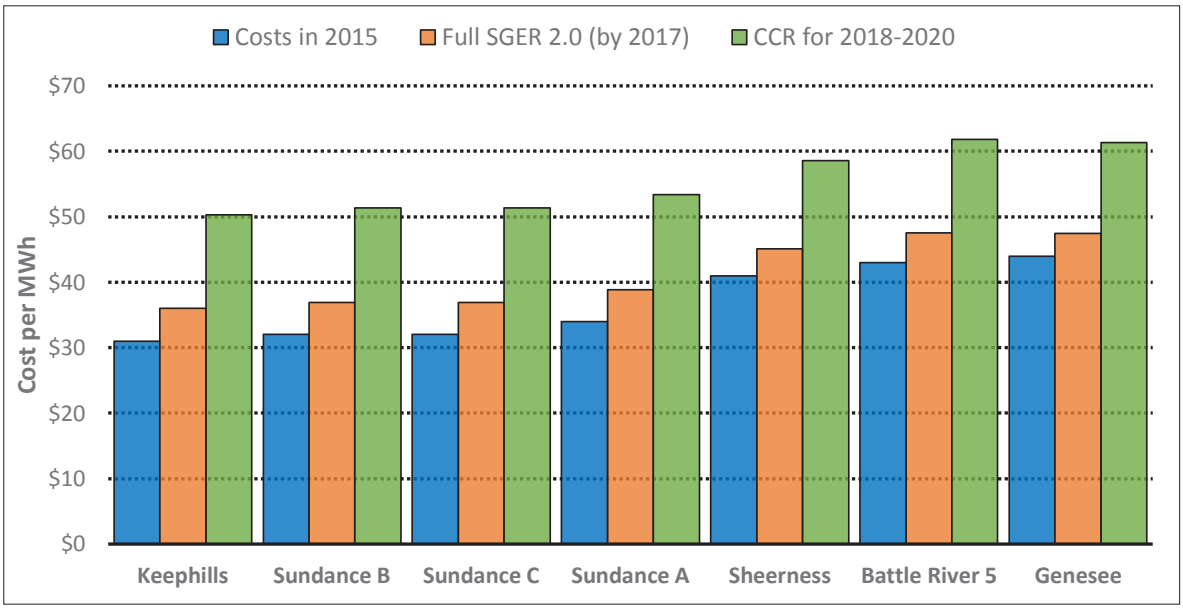


Note: Displays the implied dollar value per MWh of free emissions allowed under SGER 1.0, SGER 2.0, and the new CCR. The PPA for Sundance A expires in 2017, so it is unaffected by the CCR.

All in, the CCR implied costs of roughly $21 per MWh for the typical coal plant — an increase of approximately $15 per MWh over and above the June 2015 SGER 2.0 changes. Conversely, gas-fired power plants would, at least for the most efficient plants, see their costs reduced. Combined, this leads us to a critical point: coal-fired power plants would become significantly more expensive to operate but would not be able to pass this cost onto consumers through higher prices, given the superior competitive position of gas-fired power plants.

To illustrate the effect of various carbon-emissions policies implemented in Alberta since 2007, we plot their effect on each PPA's costs in Figure 3. In green, we see the increased costs associated with CCR.

FIGURE 3 THE EFFECT OF POLICY ON COAL-POWER PRODUCTION COSTS



Note: Using break-even production costs reported by the Balancing Pool in September 2015. We add to that estimates of carbon costs under various policies based on facility-level SGER compliance data. The PPA for Sundance A expires in 2017, so it is unaffected by the CCR.

So, that's what the climate panel did — but what didn't it do? As shown above, the CCR likely had greater impact than what coal-power producers and PPA holders expected — and they were also potentially holding out for something better. The owners of many coal-power plants covered by PPAs had been pushing what they called *mass-based* approaches to GHG emissions. Under these proposals, there would be a hard cap placed on the aggregate level of emissions from coal-fired power, with quota under the cap allocated to individual generating units and provision for trading of quota between plants. This system would replace the emissions price charged on all emissions as part of the SGER, and would have effectively created a separate cap-and-trade program for coal-power emissions alone. Such proposals would not inherently lead to lower costs, but the proposals for the cap in this case were not particularly stringent. One mass-based policy proposal suggested the cap be placed at 70 per cent of the emissions, "which would have occurred had all coal units produced their maximum available output until they were 50 years of age," with similar

approaches applied to air-quality controls.[11] Other participants suggested 20 per cent reductions relative to emissions at historic levels or historic average availability and other modifications of the same, basic elements.

A mass-based approach, if adopted as suggested, would likely have had a lower cost impact on coal generation as it would have, at least in some of its incarnations, allowed the plants to operate largely as they had been, without facing significant incentives to reduce emissions below what they were otherwise likely to be. For example, note first that coal plants do not produce at their maximum available output. In most years, actual capacity utilization has been approximately 20 per cent below the 90-plus per cent maximum potential availability, and today is also well below historic availability. For example, in 2015, the capacity utilization for Alberta's coal-generating assets was just over 70 per cent, while historic and maximum potential availability factors are at or above 90 per cent.

This means that, for many of the mass-based proposals, much of the proposed cut was already included in normal dispatch decisions by firms and operations of the power market. Furthermore, many of our least efficient coal plants are expected to shut down earlier than they otherwise would have for market reasons, given the low power prices we discuss below. In the presence of a hard cap, this would create a further surplus of permits for the remaining coal plants that didn't shut down. The end result: coal plants would face zero or near-zero average costs of GHG emissions.

So, holding out for more advantageous policies under the Climate Leadership Plan provides one possible reason why PPA holders may not have wanted to terminate earlier in 2015.

But there's more.

THE THIRD PIECE: POWER PRICES

After the introduction of the CCR, many speculated that higher prices would follow. But those who have analyzed the specifics of the policy ultimately found limited support for significant price increases — IHS, for example, found expected price increases of $8 per MWh.[12] More recent evidence from the forward market for electricity shows no expected price increases at all. In fact, the expectation for future power prices has dropped, likely due to the combination of the announced policies and other market factors. Before the announcement of the Climate Leadership Plan in November, market prices for 2018 and 2019 power futures were in the $55–$60 per MWh range. Today, those same contracts are priced between $42 and $48 per MWh.

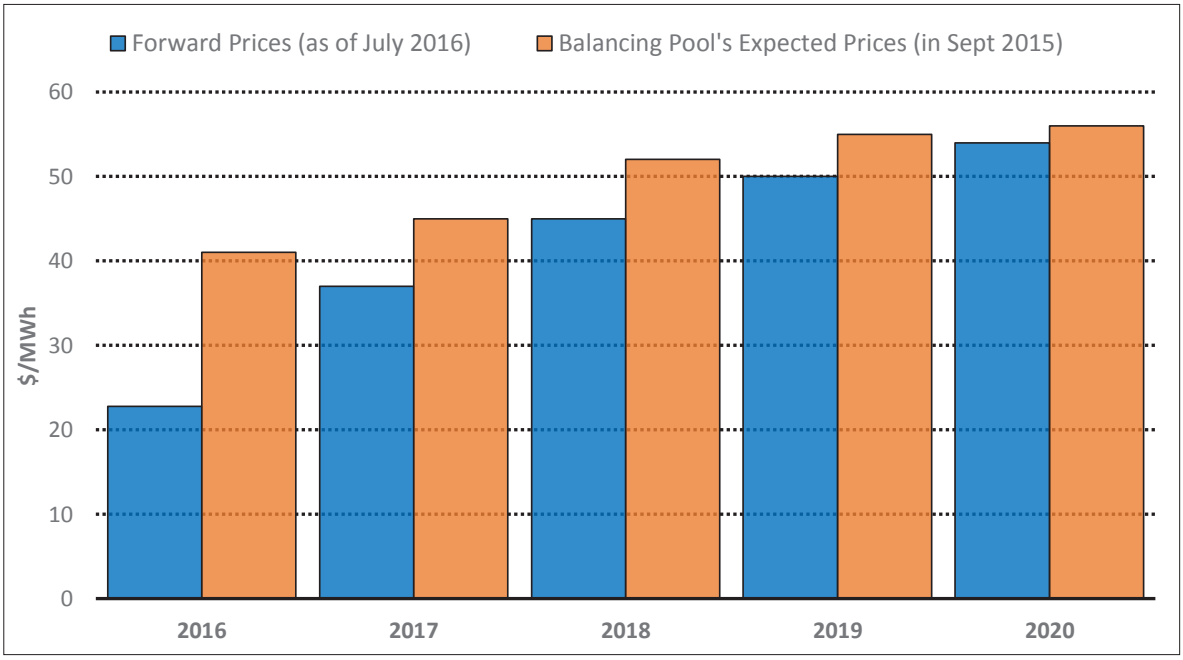
And, it's not just future price expectations that have dropped — current and near-term power prices have collapsed. To see just how much lower prices are today relative to where we thought they would be, we compiled data on the first few months of 2016 and

[11] For examples, see submissions from ATCO, Capital Power, Enmax or TransAlta to the Climate Leadership Panel.

[12] Tristan Wallace and Parker Littlehale, "Alberta's New Carbon Tax Targets Coal," *IHS Insights* (2016).

the market's expectation of future prices.[13] We then compare these to what the Balancing Pool expected prices to be as of September of last year — an expectation based on forward prices at the time. The differences displayed in Figure 4 are stark.

FIGURE 4 FORECAST ELECTRICITY PRICES, 2016-2020

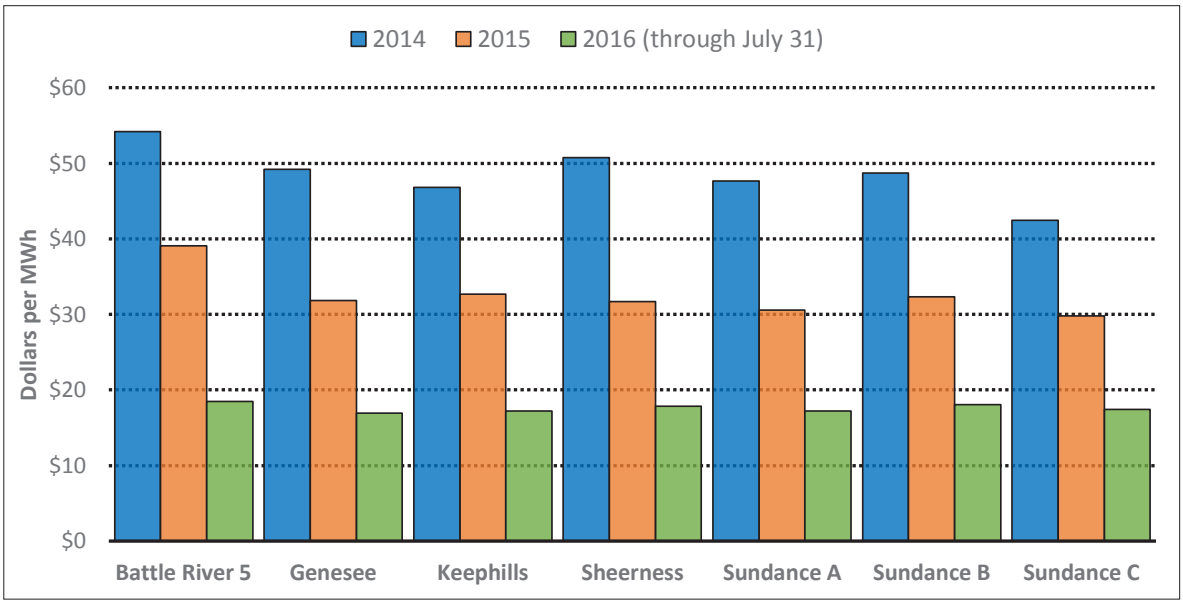


Note: Forward prices are specifically "NGX Fin FF, FP for AESO Flat (CA/MWh)" available at http://www.ngx.com/?page_id=561. We compare these to the Balancing Pool's price expectations reported in the document referenced earlier. These were based on forward prices at the time.

Electricity prices for 2016 will be roughly *half* what we thought they would be. Indeed, in every year between now and 2020, prices are expected to be lower. And this comes on top of significant drops in the value of power produced by Alberta's coal-generating units over the previous two years. As shown in Figure 5, while coal power produced by PPA units was worth, on average, nearly $49 per MWh based on spot-market pricing in 2014, thus far in 2016, the average value has been less than one-third of 2014 values, at less than $16 per MWh.

[13] For historical prices, see the AESO ETS data at http://ets.aeso.ca/. For forward prices, we use recent settlement prices for "NGX Fin FF, FP for AESO Flat (CA/MWh)" available at http://www.ngx.com/?page_id=561. The Balancing Pool used forward prices to construct its estimate that we plot in Figure 4.

FIGURE 5 ELECTRICITY PRICES SINCE 2014, BY PPA



Note: Displays the average value of power produced by each coal-generating unit in Alberta for 2014, 2015, and 2016 through July 31, along with average hourly power pool prices. Date source is NGX via NRGStream. Average revenues may be higher or lower than average values as these estimates do not include revenue from long-term contracted power sales and use the spot price to value all generation.

These price drops have *massive* revenue implications for the PPAs. Let us illustrate with a simple example. In 2014, Enmax's Battle River 5 PPA generated just over 2.5 million MWh of electricity. Assuming spot-market sales, with prices down over $18 per MWh in 2016 from what was previously expected, revenue would be roughly $45 million lower in 2016 alone. Add to this the revenue losses expected between now and 2020 and the Battle River 5 PPA alone may lose roughly $100 million. As their initial valuation in the Balancing Pool note was only $14 million, this PPA is in bad shape whatever might have happened with government policy.

So, if you want to reach a conclusion about the PPAs and GHG policies, you'd be best served to state that they are in a money-losing position not in addition to some expected price increase brought about by the Climate Leadership Plan, but because the market is not expecting a price increase in response to the Climate Leadership Plan and because prices are already at historic lows. If the coal-power producers and PPA owners were able to simply pass these costs through to consumers through higher prices, the contracts would be in the money and we would not be having this discussion.

PUTTING IT ALL TOGETHER

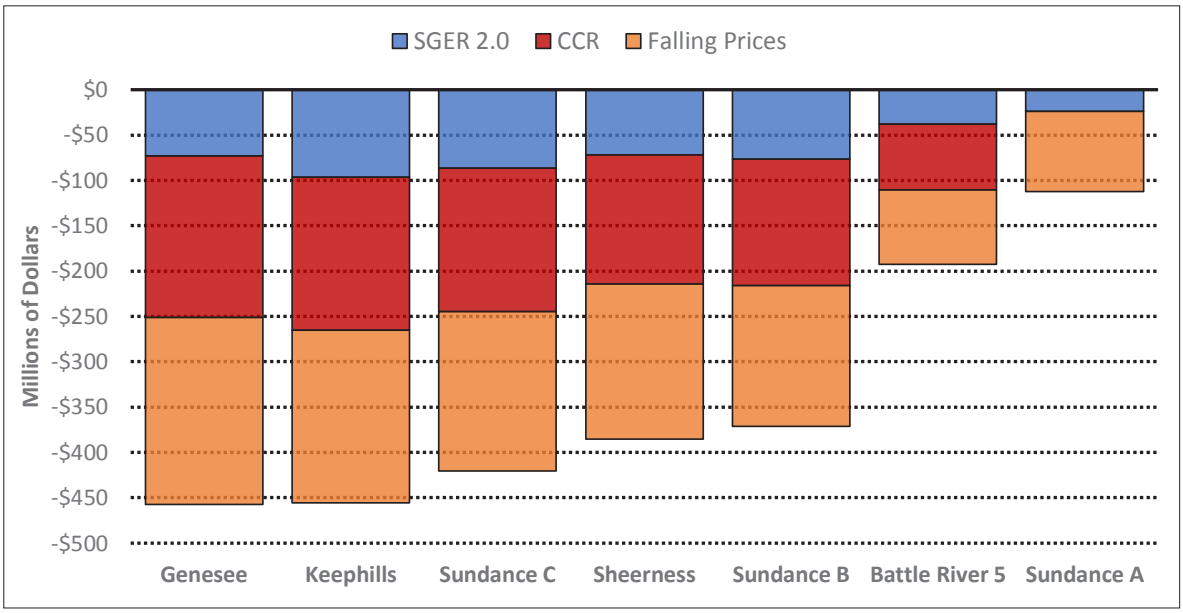
As many view the PPA terminations as resulting directly from government policy changes, it is critical to try and disentangle the effect of those policy changes from other factors.

As we described above, higher costs mean lower PPA values in the same way that lower revenue does. There is no denying that changes in government GHG policy have increased the cost of coal-fired power, as carbon pricing should, given its primary goal of lower emissions. Coal-fired power is over twice as emissions-intensive as natural-gas combined-

cycle power, with the latter also having lower emissions of other air contaminants as well. The June changes to SGER alone would have added over $4 per MWh to costs from 2017 onwards (and adding over $2 per MWh in 2016). From 2018 onwards, the CCR, which eliminated higher production subsidies offered to coal generators, would add even more.

Using emissions and generation data relevant for each PPA, we estimate the impacts of policy and price changes on PPA values.[14] To illustrate the effect of SGER 2.0, we presume it would have continued until 2020. The new incremental effect of the CCR is then added on top of this. In Figure 6, we plot these two policy changes in blue and red. Together, they represent the total estimated costs of all policy changes by the government on PPA values. The approximate net present value of these costs is $200–$250 million per PPA.[15]

FIGURE 6 ESTIMATES OF THE CHANGE IN PPA VALUES, BY SOURCE



Note: Displays an estimate of the change in PPA net present values from summer 2015 (pre-SGER 2.0) to summer 2016. These are rough estimates, as we do not account for other offsetting factors that might mitigate certain policy or price costs. We presume unit-level emissions intensity is the same as the facility-level intensity, and we use unit-level generation data for 2014.

Price reductions are, interestingly, of a similar magnitude as the policy changes. So, with the exception of Sundance A (which expires in 2017) and Battle River 5 (which is only one unit), PPAs have lots somewhere around $350-$450 million dollars in valuation since the middle of 2015.[16]

What are the implications for Albertans? To answer this question, we next aggregate the results in Figure 7 across all PPAs. We estimate the changes to SGER in June 2015 lowered the total value of PPAs by roughly $500 million, and the forthcoming CCR lowers them by another $850 million. Finally, lower current and forecasted prices between now and

[14] Specifically, we apply facility-level emissions-intensity data to all units and use 2014 unit-level generation data.

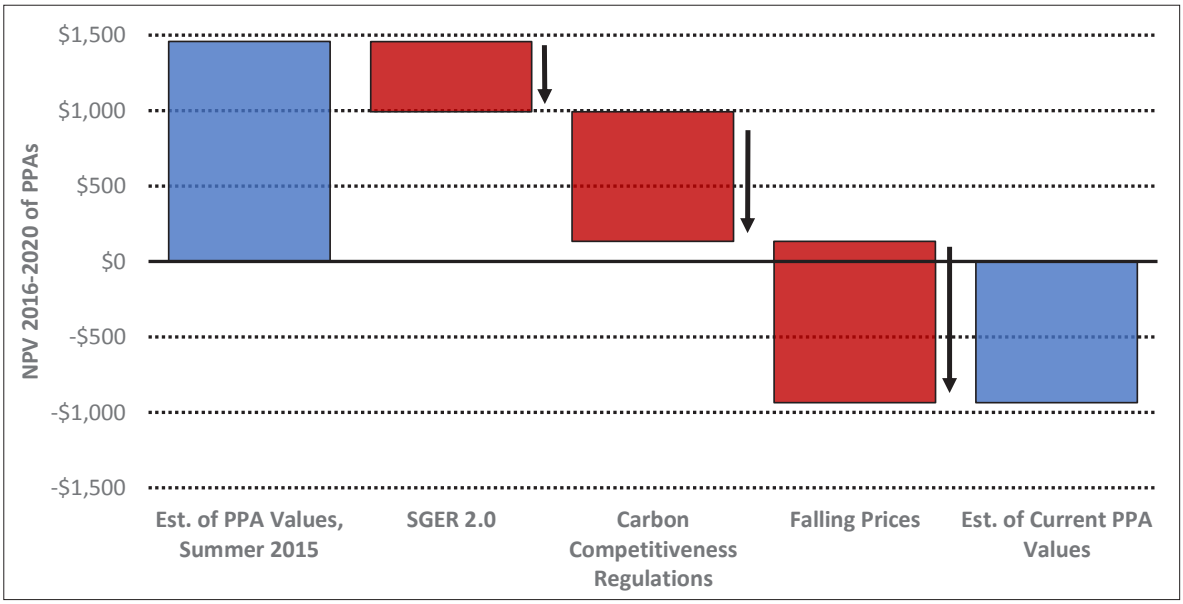
[15] Net present values calculated using a 10 per cent annual discount rate, consistent with the assumptions used by the Balancing Pool in its analysis.

[16] While the PPA for Sundance A expires in 2017, the plant itself does not close. The PPA for Battle River 5 covers only Unit 5 of the Battle River Generating Station.

2020 lowered the total PPA values by nearly $1.1 billion. So, roughly one-fifth of the total reduction is due to SGER, one-third due to CCR, and the remainder due to lower prices.

We plot these changes in Figure 7. But for SGER, CCR, and prices, the PPAs would be worth somewhere on the order of $1.5 billion.[17]

FIGURE 7 DECOMPOSING THE DECLINE IN ALBERTA PPA VALUES



Note: Displays our rough illustration of the change in the total net present values of all PPAs between summer 2015 (pre-SGER 2.0) to summer 2016.

The policy and price changes lower that value such that, today, the overall value of the PPAs is roughly *negative* $900 million. That means the Balancing Pool is responsible for this amount. Importantly, this estimate suggests things are better than the $2 billion in losses advertised by the government in relation to the PPA lawsuit.[18] Better still, the Balancing Pool has always owned the Genesee PPA, so the *new* losses are closer to $600 million. Not a small amount, to be sure, but better than otherwise. And, importantly for Albertans, these losses only occur if prices stay low.

These aggregate losses have implications for electricity bills in the province. Each year the Balancing Pool rebates its expected surplus to electricity consumers. In 2016, for example, it will return $205 million by giving all consumers $3.25 per MWh consumed. PPA losses will lower this rebate. To estimate by how much, we take our estimate of aggregate PPA losses per year and presume the $63 million cost per $1 per MWh rebated in 2016 holds from 2017 onwards. Though it will vary across years, we find the typical residential

[17] Note: The Balancing Pool estimated in September the NPVs *net* of the new SGER regulations. It reports this at about $1 billion. So, we simply add back an estimate of those incremental SGER costs to get the initial pre-SGER 2.0 summer 2015 valuation.

[18] For the government's position, and its estimate of losses, see: Canada. Government of Alberta website, "Power Purchase Arrangements," http://www.alberta.ca/power-purchase-arrangements.aspx. The government's $2 billion estimate may be based on lower price forecasts, which have risen significantly since the start of the year.

household will see its electricity bill rise by roughly $2.25 per month. For comparison, so far in 2016, the energy charge due to lower prices has been $10 per month lower for the typical residential household than in 2015, and $24.50 per month below 2014 levels.

So, if you're looking at this and thinking, "not only are power prices going up, but I am going to have this additional charge," think again. You are better thinking that this additional charge reflects the fact that Enmax, Capital Power, TransCanada and others looked at the future of the electricity market and concluded that prices were unlikely to rise enough to make these contracts profitable. So, while a Balancing Pool charge (or at least a smaller rebate) may soon appear on Albertans' bills, it will only do so if the power portion of bills (for those on floating-price contracts) is much lower than many would have thought possible only a few short months ago. If a charge does appear, it will be because Albertans continue to pay electricity rates lower than they've seen in decades.

CONCLUDING THOUGHTS

So where do we go from here? There are many potential outcomes.

Were it not for the present court case, the Balancing Pool (which operates as a natural person, not an arm of government, under Alberta law) could have chosen to terminate the PPAs once they'd been returned. To do so, the Balancing Pool would have to pay out the remaining net book value of the payments due to plant owners, estimated by Capital Power recently to be between $635–$950 million (depending on how it is managed and which are terminated).[19]

If this option were exercised by the Balancing Pool, the plants then revert to their owners and some may be shut down or operated less frequently than they otherwise would be, leading to prices increasing in the electricity market. It is also worth noting that if the PPAs revert back to the power plant owners, we would be in the very situation that the PPAs were meant to avoid: concentrated offer control within Alberta's electricity market. So, while the buyout of the PPAs by the Balancing Pool might look like the lowest-cost option in a vacuum, before approving such a buyout the government should likely consider not just the cost of the buyout, but also the likely long-term incremental impact on power prices. It could thus determine which option was best, on the whole, in terms of keeping Alberta power bills as low as possible. While the Balancing Pool retains control of the PPAs, it must seek the approval of the minister of energy before terminating any PPA.

That issue aside, the court case could provide the government with an improved bargaining position vis-à-vis the previous PPA holders. The intent of the termination provision was to insure PPA buyers against the risk of policy changes that would adversely affect their investment. In the event a change in law imposed costs on the buyers to *render them unprofitable*, the buyers had the right to terminate the PPA to avoid such losses. The lawyers at the time recognized that such language might preclude buyers from avoiding policy-induced losses if the PPAs were already in an unprofitable position due to market

[19] For this, and Capital Power's overall reaction to the government's litigation, see Capital Power website, "Capital Power responds," 2016.

conditions — hence the "*or more unprofitable*" addition. The result is that PPA buyers in an unprofitable position, subject to any change in law, can terminate the PPA and avoid *both* policy-driven and market-based losses. The latter was unlikely the intent of the original Section 4.3(j).

So, when prices are high, policy costs are borne by the PPA holder (unless the costs are sufficient to tip the PPA into unprofitability). When prices are low, policy costs *and* market losses are potentially borne by the Balancing Pool. A negotiated settlement may be one where PPA holders take on at least some of the losses due to low prices, while Albertans bear the costs of changing policies — something more in line with the spirit of the arrangements.

In any case, with the case awaiting its first hearing on November 2nd, we can be sure this issue will be with Albertans for some time to come. It's worth keeping an eye on.

About the Authors

Andrew Leach is an energy and environmental economist and is Associate Professor at the Alberta School of Business at the University of Alberta. He has a PhD in Economics from Queen's University, and a BSc (Environmental Sciences) and MA (Economics) from the University of Guelph. His research spans energy and environmental economics with a particular interest in climate change policies. In 2015, Leach was Chair of Alberta's Climate Change Leadership Panel, and in 2012-2013 he spent a year on leave from the University of Alberta as Visiting Scholar, Environment Canada, where he worked mostly on greenhouse gas policy for the oil and gas sector. Outside of work hours, his free time is spent with his two kids, Will (8) and Caroline (6), as well as tweeting, blogging, cycling, and running.

Trevor Tombe (PhD) is an Assistant Professor of Economics at the University of Calgary and a Research Fellow at The School of Public Policy. Prior to joining the University of Calgary in 2012, he was an Assistant Professor of Economics at Wilfrid Laurier University in Waterloo, Ontario. He received his PhD and MA from the University of Toronto. His research focuses on the intersection of international trade and macroeconomics, with a particular focus on the factors influencing productivity within and between countries. He has published in a variety of leading economics journals, has written various policy papers through the University of Calgary's School of Public Policy, and is an occasional contributor to *Maclean's* and the *Financial Post*.