

# Carbon Market Metrics and Opportunities

An Alberta Perspective

Discussion document prepared for



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# Summary Document

## Abstract

The world is embarking on substantial carbon intensity and emission reductions, most culminating in net-zero by 2050 or 2060. Most jurisdictions participating have chosen methods that attempt to reduce emissions both by a carrot (investments/subsidies) and a stick (tax) approach. Canada's evolving approach to carbon (and equivalent) emissions and intensity reductions is no different. Canada has developed a multi-faceted policy approach to target particular sectors for carbon reduction. Canada's strategy to date appears to be five-fold, with supporting legislation;

1. *Large Industrial Caps* – as part of the Greenhouse Gas Pollution Pricing Act (GGPPA, 2018), Canada developed a backstop method of carbon management called Output Based Pricing System (OBPS). This system is an allocation-based system that assigns allowances to large emitters, with the intent of decreasing those allowances over time. Issues around carbon leakage and return/use of collected funds are contemplated.
  - a. In 2022, the Alberta and Canadian governments agreed to allow OBPS be supplanted, from 2023 through 2030, with Alberta's domestic solution called Technology Innovation Emission Reduction (TIER), a cap & trade (C&T) system that considers Alberta's specific needs. TIER was a replacement of other previous systems Alberta had in place for large emitters since 2007, namely the Special Gas Emitters Regulation (SGER) and the Carbon Competitiveness Incentive Regulation (CCIR).
2. *Consumption Fuel Charge* (“carbon tax”) – also part of the GGPPA was a fuel charge that imposed the federally mandated backstop carbon charge onto sales of carbon fuels (coal, gasoline, diesel, avgas, natural gas, etc.). Alberta has chosen to accept the federal backstop instead of developing a domestic solution. However, this can be patriated similar to Quebec, which has chosen to roll the federal carbon tax into their overall cap and trade system.
3. *Reduce Carbon Intensity of Liquid Fuels* – With the Clean Fuel Regulations (CFR), as part of the Canada Environmental Protection Act, 1999 (CEPA), the federal government has implemented a strict requirement of gasoline and diesel fuel marketers to reduce the carbon intensity per megajoule (MJ) of energy. From 2023 to 2030, for example, the reduction is estimated to go up from 3.5MJ/CO<sub>2e</sub> up to 14MJ/CO<sub>2e</sub>. Producers and dealers are required to achieve prescribed fuel specifications (the Clean Fuel Standard), and a credit system is expected to follow for non-compliance clearing. The credit system will most likely evolve to be similar to RIN credits in the US.
4. *Reduce Carbon Intensity of Electric Generation* (with some demand management) – The Clean Electricity Regulations (CER) are a new draft initiative designed to reduce fossil fuel generation. It has a draft requirement of any new carbon fuel electricity generation units commissioned after 2025, have full carbon abatement by 2035. Existing carbon fuel units will be subject to current rules until 2035 and then follow strict CER rules at end of life, with a few exceptions.
5. *Net-Zero by 2050* – Canada enacted in 2021 the Net-Zero Emissions Accountability Act (NZEAA) which requires Canada as a whole be a net-zero country by 2050. There is also an

advisory board appointed to manage the necessary public reporting and fund use management that is availed by the Act.

6. *Supplemental Legislation and Efforts (in no order)*

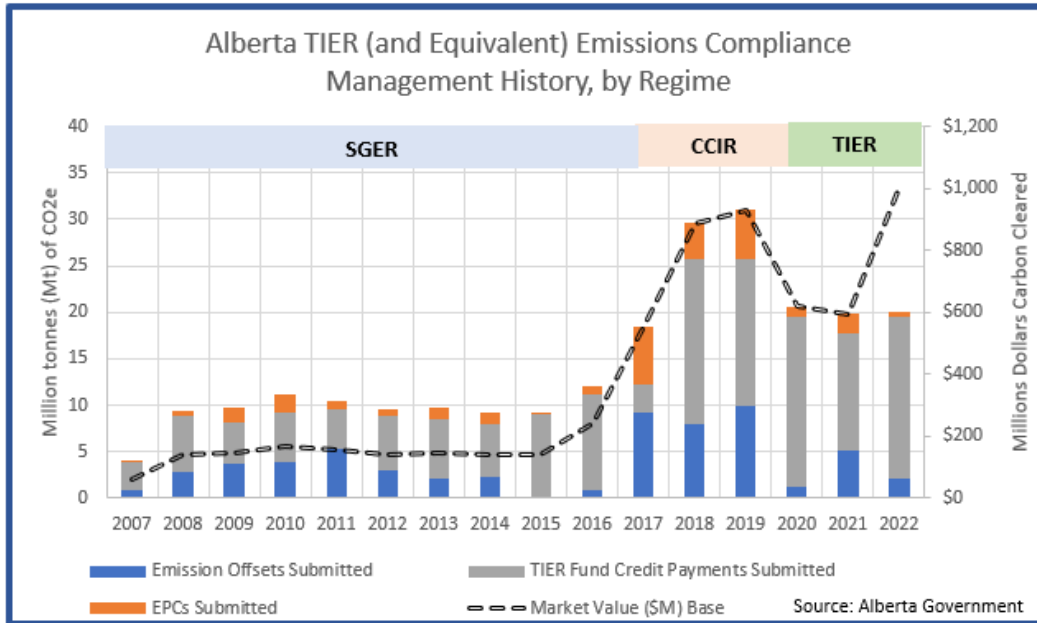
- a. Pan-Canadian Greenhouse Gas Offsets Framework (2019) – the Canadian Council of Ministers of Environment attempted to establish the broad rules of offsetting carbon obligations and leakage concerns.
- b. Greenhouse Gas Offset Credit System (GGOCS) – voluntary credit projects that meet specific criteria can generate carbon credits viable for OBPS trade.
- c. Introductory work to support hydrogen research and market development.
- d. Methane and VOC measurement and capture strategies.
- e. Coal generation phase out by 2030, CER.
- f. Demand management subsidies for residential and commercial strategies.
- g. Zero emission vehicle and charger network subsidies.
- h. Low Carbon Economy Fund.
- i. Regulatory Framework for Oil and Gas Sector Greenhouse Gas Emissions Cap proposed in December 2023. This is proposed as a net-zero strategy, so we can anticipate some credit clearing allowances to be included as part of a C&T system.
- j. Funding of Canada Investment Bank low carbon strategy.
- k. Funding of \$15 B to the Canada Growth Fund to invest directly into low carbon strategies (e.g. Eavor Technologies Inc. geothermal, and Entropy Inc carbon credit offtake agreement).
- l. Etc.

The carbon market in Alberta has great potential for further evolution. Alberta is well suited to participate in numerous ways, with the inertia of legislation and the overall economy. The viability of future investments will include the carbon impact of that activity. The role that an organized clearing mechanism can provide, being transparency and tradability of longer-term pricing, will help support the ability to value the carbon impact of economic activity.

## Alberta Review

Alberta is an early adopter of climate focused initiatives, mostly within the context of large industrial carbon emitter regulations. The original program, SGER, began in 2007 and will continue in present day TIER-form until at least 2030, as the federal and provincial government signed a new ratification in late 2022. This provides us with good historical and forecastable perspective regarding the size of the carbon market (capitalization) in terms of carbon units and total costs per unit of carbon. As discussed, it cannot be overstated the importance of carbon price transparency for investment and risk management decision-making.

To date, we have had legislated carbon backstop pricing. It has provided a known and fairly low default price for carbon emitter obligations. However, as these prices are scheduled to rise rapidly through 2030, one would expect that the secondary market in offsets and performance credits will evolve with some tradeable and transparent forward pricing. But more on this later.

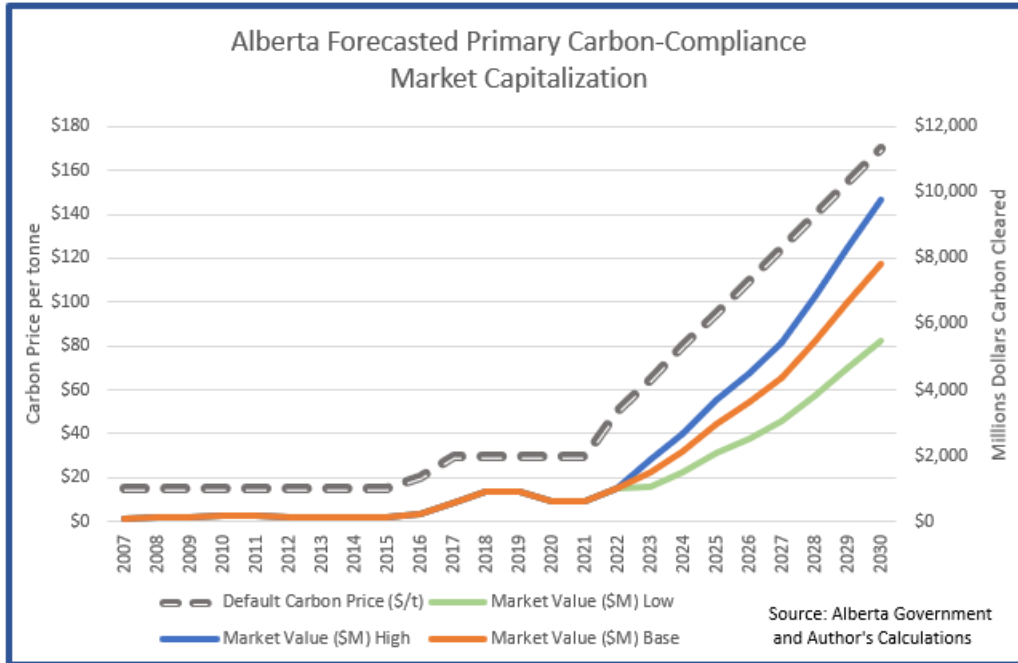


As shown, the Alberta carbon market has grown sporadically with different regimes and rules, as well as due to large coal generation plants being de-

commissioned. However, overall, the market capitalization has grown from being a \$60 M market in 2007 to sixteen times that in 2022, near \$1 B. And with a rapid rise in carbon prices codified in the new TIER agreement (from 2023 through 2030 of \$65 to \$170/tonne), we anticipate that the carbon market capitalization will grow substantially.

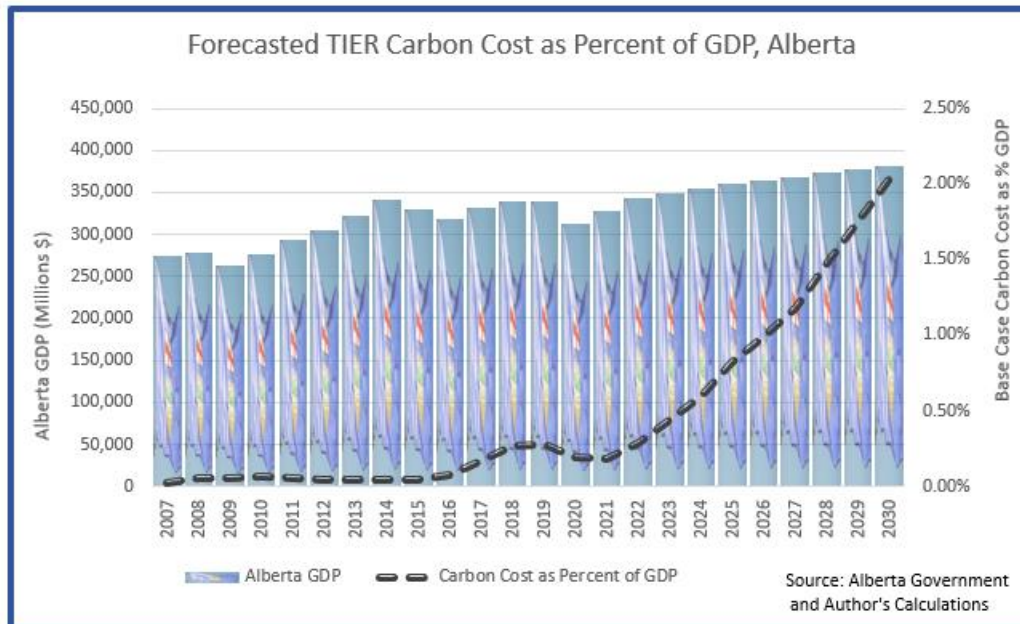
Stepping back, it is important to say that if you are going to be any good at forecasting, then you must forecast often. There are many moving parts in this forecast, not the least of which is if a new federal government will change the regulations post-2025 or the 2026 scheduled TIER review. Canada must hold a federal election on or before October 2025 and the leading opposition party has signalled its fundamental disagreement with existing legislation. We will not attempt any political prognostication as it is a mugs game. But we have tried to show the major components that will affect the carbon markets and general economic activity in Alberta. This carbon-legislated world we are creating is very new and subject to whims. It is early days.

Also, it must be noted that we are using known costs maximums for the clearing price of carbon credits. As the chart above shows, in the last few years default-priced clearing has definitely been the norm in Alberta, with a large percentage of credits clearing into the provincially administered TIER Fund. One would not expect that to continue when backstop prices rise rapidly above \$100/tonne, but it takes time. Carbon capture, farm and forest management, solar and wind generation, hydrogen technology, performance credits, etc. should generate tradeable credits at prices below these levels, once developed. However, forecasting the amount and cost of carbon abatement technologies is difficult. Further work has been done to scenario plan other outcomes, elsewhere.



Looking beyond 2022, out to the end of the new TIER arrangement, one sees that with the growth anticipated in volumetric carbon compliance coupled with rapidly rising carbon prices, the total value of

the carbon market will grow exponentially. The forecast shows three cases, that expect the market size to grow from around \$1 B to between \$6-10 B. That type of cost growth will start to have an impact on the speed of overall economic growth, and is one more complicating factor in the economic feedback loop. But we see that the rapidly rising carbon price mandated is a substantial component of the total carbon market capitalization.



The comparison of carbon market capitalization to the size of Alberta's GDP is a good leverage metric. It provides us a sense of scale and potential economic impact.

As shown, we anticipate that

the economy will grow, but at a slower rate through 2030. However, we see that the carbon market capitalization growth, from trivial to up to 2% of the Alberta economy. That is substantial growth in the market size and will incent change to lower carbon technologies.

## Wind Up

The Canadian carbon market capitalization is growing in size, but no Canadian jurisdiction is growing faster than Alberta. I have attempted to measure the many moving variables in the carbon market, and to boil it down to the market cap size of the carbon market. Knowing this has many uses, including;

1. Quantifying the impacts of the carbon market charges on the broader economy
2. Qualifying government programs needed to support or allay economic positives or problems that will arise from the costs associated to carbon.
3. Estimating the size of the market for carbon trading, beyond the primary market discussed here:
  - a. Quantification of opportunities for churn in a formal commodity market environment.
  - b. Carbon market cooperation with other provincial jurisdictions (contemplated in the Pan-Canadian Greenhouse Gas Offsets Framework).
    - i. Concerns about split carbon market prices evolving in Canada, due to each jurisdiction working independently. This leads to a need for a universal pricing and clearing system in Canada.
  - c. Market growth potential with other carbon schemes proposed (e.g. CFR).
  - d. Market growth potential into other sub-national and national jurisdictions via Article 6.2 and 6.4 of the Paris Agreement, 2015 – UNFCCC.
4. Etc.

The Alberta marketplace has many of the necessary components required for an organized clearing market to develop. As a consequence of our domestic energy companies' daily activities, the Alberta ecosystem has developed a strong culture around risk and risk management. Today Alberta has a vibrant:

1. Trading industry
2. Market-making community
3. Brokerage and screen trading culture
4. Well capitalized market participants
5. Risk management systems and reporting
6. Contracts and credit support

This allows for the development of complementary markets quite quickly, if done correctly. However, I believe that a TIER-only market isn't ideal. That market clearing system doesn't provide much opportunity for non-Alberta based entities to participate. For a carbon contract to flourish, it requires participation in a broader geographic and economic marketplace, with a breadth and depth of players. It will be difficult to entice, say, Ontario or New York trade participants with a blinkered contract settled in Alberta.

Incrementally, Alberta is not unique in the world, with carbon obligations escalating rapidly. Technologies, along with changing behaviours, will solve the need for carbon credits in the long term. However, the world has been slow to take up new technologies, along with the amount of low hanging fruit diminishing. For example, we only need to look to BC's Site C Dam to see an example of how arduous and expensive new hydro can become.

But, for new carbon reduction technologies to be integrated, they will follow the traditional investment cycle. And the most important variable in the investment cycle is long term price discovery. A transparent pricing mechanism, that is germane and applicable to sub-national and national regimes, is the first major step to the de-commissioning of old technologies and for the integration of new low carbon technologies.

Dave