Alberta Emission Offset System
Draft Methodology for the Electricity Grid Displacement Factor
Comments Table

Comments submitted by:

Alberta Market Surveillance Administrator

You are invited to review the *Draft Methodology for the Electricity Grid Displacement Factor* and to provide written comments using the table below. This will ensure a complete and accurate consolidation. Please send comments to:

- AEP.GHG@gov.ab.ca

Written comments will be accepted until **April 4, 2022** at 5:00 PM MST. If you need an extension to provide please contact AEP.GHG@gov.ab.ca prior to April 4, 2022.

Page # & Line #	**Clause/Section/Number/Table/Figure** **(Specify # where applicable)**	**Nature of the Comment** **(Editorial, Overarching, Technical)**	**Comment/Question** **(Please provide rationale and a proposed solution or revision)**
Pg.4	Introduction and Calculation Methodology	Overarching	The *Draft Methodology for the Electricity Grid Displacement Factor* document specifies the intention of the EGDF as follows: "The EGDF is intended to provide a quantification of the greenhouse gas emissions intensity of the MWh of the marginal generation that will be impacted by the project activity." (p.4) **Comment 1**: Because of the current trajectory of grid decarbonization, which is expected to continue to decrease, using any historic data period over-represents the emissions that will reasonably be expected to be displaced on a forward-looking basis. Projects credited at this EGDF will receive greater emissions offset credits than are likely to physically occur on the grid throughout their credit period. This determination of 'the greenhouse gas emissions intensity of the MWh of the marginal generation that will be impacted by the project activity' would more properly be represented by use of forecast generation data. **Comment 2**: The structural calculation of the EGDF as an equally weighted average of Operating Margin and Build Margin does not represent the specified intention of the EGDF to "provide a quantification of the greenhouse gas

			emissions intensity of the MWh of the marginal generation that will be impacted by the project activity." This effect would properly be represented by a 100% weighting on a forward-looking Operating Margin. The Build Margin, being the average emission intensity of recent generators, does not necessarily reflect any generation that will be displaced on the margin. This is particularly so if the recent additions are mostly wind and solar generation capacity, which are virtually never on the margin. While incorporation of the Build Margin in the current formula may practically offset a portion of the higher emission intensity levels that result from use of a historical Operating Margin, use of a forward-looking measure of Operating Margin would more accurately reflect the stated intend of the EGDF.
Pg. 4	Calculation Methodology – Electricity Grid Displacement Factor (EGDF)	Overarching	**Comment 1:** The offset program that is based upon the EGDF pre-dates the TIER environmental performance credit program (and its predecessor the CCIR) which is based on a set emissions intensity of 0.37 tCO2e/MWh. The simultaneous existence of these two programs creates different sets of incentives for the same potential generators of credits. Specifically, given that the EGDF is expected to decline, the current framework creates an incentive for new non-emitting projects to build as soon as possible to maximize the value they can lock in through the higher EGDF that is applicable throughout their crediting term. This is not consistent with the investment outcomes that would have occurred in an environment where investment in generation of electricity is guided by competitive forces operating in a fair and open market, as is the legislated intent of the market (e.g. as contemplated in section 5 of the *Electric Utilities Act* and in the *Fair, Efficient, and Open Efficient Regulation*). For the electricity sector, TIER is a comprehensive emission pricing scheme that applies to all technologies equally whether they are creating or offsetting emissions. Differing benchmarks in the creation of offsets outside of TIER and emission performance credits within TIER may

			lead to unintended outcomes. For example, if the offset system outside of TIER is generating more offsets for the same amount of generation than those created within TIER, this may make cheaper offsets and the carbon price less effective at reducing emissions, thereby undermining the pricing signals of TIER. Setting the EGDF at the same level as the TIER benchmark for the electricity sector, or requiring TIER-eligible generators to opt into TIER instead, would improve the consistency of carbon pricing signals provided to all generators. This is also a good opportunity to evaluate whether this program should still be applicable for generation projects in the presence of the TIER framework and, if so, to provide additional clarity on the specific separate intents of each respective framework. **Comment 2:** When new policies are introduced, it is possible that the implementation approaches of existing policies in the same area may no longer be optimal for the purpose they were created to serve and may need to be revisited. At the time when the emissions offset construct was instituted in Alberta, carbon related costs to generators were determined under the *Specified Gas Emitters Regulation* (SGER), and generally speaking were significantly less than they are today. Offers made to the power pool incorporate all costs incurred by generators, including those related to carbon emissions. As such, changes in carbon costs are reflected in the pool price that is paid to all generators, including those who receive offsets. The TIER policy has the effect of increasing hourly pool prices because the cost of carbon emission is reflected in offers that are dispatched. Additionally, the TIER policy may have resulted in long-run changes (e.g., generator retirement or conversion decisions) that place upward pressure on pool prices. To illustrate the higher average levels of pool prices, one can consider the minimum price

			that the large majority of hours in a year were at or above. For example, in 2015 under the SGER construct in place at the time, the pool price was above $14.00 / MWh in approximately 90% of all hours, while in 2021 the pool price was above $36.00 / MWh in approximately 90% of all hours. The average prices in these hours were clearly much higher than these values. This means that the power pool now effectively guarantees substantial revenues for all zero and low emitting, zero marginal cost generators than it did in 2015. This substantially reduces investment risk associated with investment in zero and low emitting generation in Alberta. In the context of the introduction of a policy that raises the pool price for all participants, the same magnitude of emissions offset provision may not be needed from the perspective of overall policy implementation.
		Overarching	Applying the EGDF as a single value that is equally applicable in all hours results in paying for environmental attributes at a flat rate and ignores variation in the marginal cost and value of carbon emissions abatement across the hours within a year. Renewable generators do not necessarily have an equivalent effect on emissions displacement when they produce. Because of the different characteristics of electricity generation technologies, certain technologies, on average, can be expected to displace different amounts of carbon when they produce electricity. For example, production from solar generators tends to occur in hours with relatively higher demand and higher prices; these hours often have a relatively higher emissions intensity. In contrast, production from wind generators tends to occur in hours with relatively lower demand and lower prices; these hours often have a relatively lower emission intensity. The current EGDF methodology provides all eligible production and equal credit level for their production and does not account for any technology-based differences in actual emissions displacement. Consideration could be given to applying different EGDF factors for different eligible

			projects to better approximate the actual displacements expected to result for the specific project type.
		Overarching	The provision of emissions offsets through the EGDF mechanism effectively assumes that investment in the project would not have occurred were those emissions offsets not provided. If the combination of the value provided through TIER-based Environmental Performance Credits (EPCs) and carbon-price impacts on pool prices would have been sufficient to drive the investment, then incremental emissions reduction would not be taking place as a result of paying a higher value to the project via the EGDF-based emissions offsets, rather than through TIER-based EPCs (i.e., at 0.52 tCO_2e/MWh as compared to 0.37 tCO_2e/MWh). At present, current pool prices and TIER-based EPCs are likely sufficient to drive investment in many zero and low emitting resources; and at present there is material investor interest in developing zero and low emitting generators in Alberta as evidenced by the substantial amount of such generation capacity that is physically under construction. The Renewable Electricity Program procurement process that was held in Alberta in 2017 and 2018 was able to procure wind generation for a cost of $37/MWh to $40/MWh. Based on these prices, it may be that at least for wind generation assets, in future years based on expected increases in the carbon price, revenues solely from the sale of environmental attributes may be sufficient to cover generation costs. Payment for environmental attributes at a rate that exceeds the average cost of generation is not sustainable in an energy-only market as it would result in generation investment decisions that have little to do with the pool price and would indirectly undermine investment in other generation technologies that are dependent solely upon revenue from the power pool.
Pg.4	Operating Margin	Editorial	Quote:

			AEi,j,k – the adjusted emissions for year i, for fuel type j, for plant k, where there are m plants. Since it cannot be assumed that each technology type is comprised of the same number of plants, *m* should be subscripted by *j,* as *"m_j"*.
Pg.5	Operating Margin	Editorial	Quote: Pi,l – production of each power plant, l, where there are o power plants, in each year, i. Since it cannot be assumed that the number of plants is the same across years, *o* should be subscripted by *i*, as "o_i".
Pg.5	Operating Margin	Editorial	Quote: $ToMi,j$ – time on the margin in each year, i, for each type of generation, j, where there are n types of generation. Given how the formulas work, it appears to us that *ToM* refers to the percentage of time on the margin, rather than time in minutes. This should be clarified.
Pg.5	Build Margin	Editorial	Quote: The production-weighted average emissions intensity of a type of generation over the study period is: $$EI_{j,2018-2020} = \frac{\sum_{i=2018}^{2020} AE_{i,j}}{\sum_{i=2018}^{2020} P_{i,j}}$$ The formula does not show a production-weighted average emission intensity, it is a simple average emission intensity. Our view is that the formula is correct but the reference to "production-weighted" is incorrect.