April 5, 2022

IESO Stakeholder Engagement
Pathways to Decarbonization

Submitted via email

Re: AMPCO Submission – Pathways to Decarbonization

AMPCO is the voice of industrial power users in Ontario. Our mission is industrial electricity rates that are competitive and fair.

Attached are AMPCO's comments on the general subject of Pathways to Decarbonization. AMPCO appreciates the opportunity to provide such feedback.

Best Regards,

Colin Anderson
President

Pathways to Decarbonization

Submission of the Association of Major Power Consumers in Ontario (AMPCO)

INTRODUCTION

AMPCO provides Ontario industries with effective advocacy on critical electricity policies, timely market analysis and expertise on regulatory matters that affect their bottom line. We are the forum of choice for major power consumers who recognize that their business success depends on an affordable and reliable electricity system.

This submission is in relation to the general subject of Pathways to Decarbonization ("P2D"). AMPCO's members are major power consumers, responsible for over 15 TWh of annual demand in the province. A reliable and affordable energy supply is critical to the success of their businesses, which is why AMPCO has an interest in this engagement.

AMPCO appreciates the opportunity to provide feedback.

AMPCO GENERAL POSITION

AMPCO understands the general need to drive towards Decarbonization. Perhaps the most critical consideration in this entire subject area is the question of pacing. Trying to do too much too soon, or ignoring the issue for too long can both lead to bad outcomes. Striking the correct pace is absolutely essential. This does not just apply to the absolute pace, but also to the pace that is adopted relative to other jurisdictions. Being seriously out of step with others will have negative impacts on competitiveness and the ability of Ontario to attract investment capital.

AMPCO does not know exactly what that pace should be. Nor does the IESO. Nor does Government. And unfortunately, recognizing a seriously incorrect pace may only be obvious in retrospect. All the more reason to proceed with the utmost caution.

Many of the assumptions that are being used as inputs to the IESO modelling appear inappropriate. Some of them appear to be more aspirational than achievable, which will affect the output of the modelling, rendering the results unusable. If input data is not complete, accurate and timely, then the resulting output is unreliable and of little value. This must be changed since this modelling will drive real decisions, costing real money, associated with P2D.

Further, AMPCO understands that the modelling for P2D cannot become a detailed integrated power system plan, but the modelling cannot simply ignore the problem that is created by assuming that energy needs currently satisfied by natural gas will somehow, in a relatively short period of time, be met by the electricity sector – a sector that is currently facing capacity issues even without the consideration of massive new levels of electrification. AMPCO realizes that bounds need to be placed around the modelling to simplify it and to allow it to be completed, but if those bounds ignore critical aspects (like realistic commercial readiness, capabilities of various generation technologies or the ability to get projects financed) then the output, again, will be unreliable.

AMPCO strongly recommends that P2D be viewed through a realistic lens – in both setting initial assumptions and in recognizing shortcomings in the approach and attempting to integrate potential solutions - rather than the aspirational lens that currently appears to be in place. The appropriate amount of time must be taken to ensure that as much rigour as possible has been brought to bear on this issue. Hoping something will happen is not a reliable plan, and Ontario simply cannot afford to get this one wrong.

Finally, the concept of balance needs to be embraced. Policy almost always serves multiple objectives and it needs to thoughtfully consider the implications of change from multiple perspectives. In this case, Ontario's actions must reflect a reasonable balance between the environment and the economy since neglect of either one can have catastrophic consequences.

ADDITIONAL DETAILED COMMENTS

1. Examples of Inappropriate Modelling Assumptions.

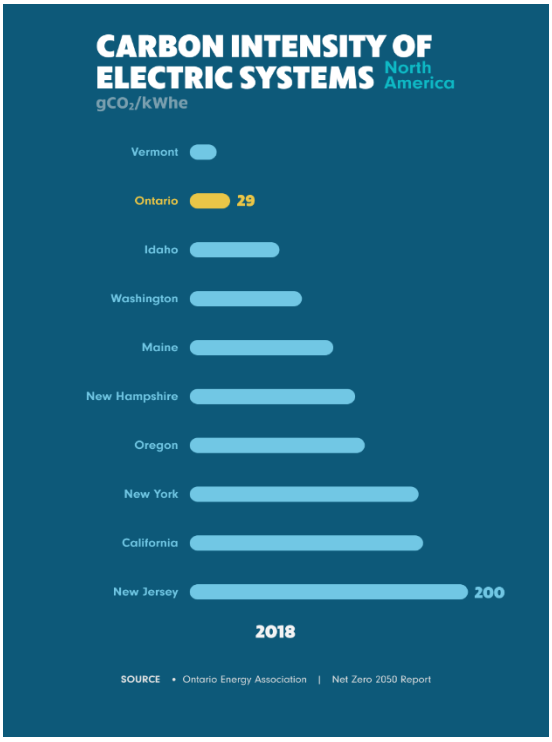
The following are examples only – the list is not comprehensive. All assumptions in the modelling should be evaluated for reasonability. In some cases, it is likely that a range may need to be used and a sensitivity analysis may be required. Page numbers refer to the IESO document entitled "Assumptions for Feedback – March 2, 2022"[1].

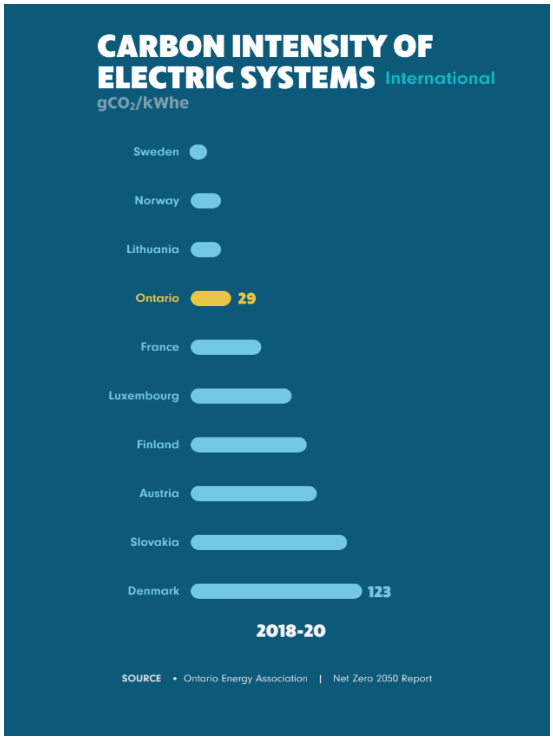
- Page 3 – zero emissions by 2030 for new residential and commercial equipment appears optimistic
- Page 3 – 100% of new equipment to be zero emissions by 2035 for residential and commercial appears optimistic
- Page 4 – total industrial fuel switching of 22% by 2050 is possibly a reasonable estimate (AMPCO renders no specific opinion on the number), although the interim values are likely no better than guesses. AMPCO finds it interesting that this amount stands in stark contrast to residential and commercial figures, which are 100%.
- Page 5 – What is ATB (in "Data Source")?
- Page 5 - Wind capacity factors appear seriously inflated
- Page 5 – Large Nuclear capacity factor appears inflated
- Page 5 – SMR Technology Readiness Level appears optimistic, with no evidence to support it
- Page 5 – Retrofitting existing gas equipment with renewable gas, hydrogen or carbon capture assumes original performance levels will be maintained, which is highly optimistic
- Page 5 – Technology Readiness Levels of Storage appear optimistic, with no evidence to support them

[1] https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Pathways-to-Decarbonization

2. Decarbonization and Electricity.

Canada has made an international pledge to a net zero economy by 2050 as part of its commitments under the 2015 Paris Agreement. AMPCO sees this as the ultimate goal that is being served in this situation and questions the need to single out a specific, relatively clean sector, for a more stringent treatment. Ontario's electricity sector is currently 94 per cent emissions-free[2]. In the short to medium-term future, increases in emissions are forecast largely as a result of the removal from service of certain Ontario nuclear generation assets. Even if this results in modest increases in emissions, Ontario's electricity system will still be cleaner than most other jurisdictions in North America, and in fact, the world[3].





Source: https://www.ontarioscleanenergyadvantage.ca/#learn

[2] https://www.ieso.ca/en/Learn/Ontario-Supply-Mix/Natural-Gas-Phase-Out-Study

[3] "Ontario has one of the cleanest systems in the world when it comes to carbon emissions per kilowatt-hour – 93% and 92% lower than the U.S. and German grids respectively, and 81% lower than the rest of Canada." - See IESO Gas Phase-Out Impact Assessment Report at https://www.ieso.ca/en/Learn/Ontario-Supply-Mix/Natural-Gas-Phase-Out-Study

Most other sectors in Ontario cannot claim the degree of cleanliness that electricity can, even after the retirement of Pickering GS. According to the Independent Electricity System Operator (IESO) in its Gas Phase-Out Impact Assessment Report[4], to replace gas by 2030 would require more than $27 billion of investment in the electricity sector – all to eliminate the small amount of emissions for which the Ontario electricity sector is responsible.

It seems reasonable to AMPCO that investing that amount of money, over the same timeframe, in another, "dirtier" sector (i.e. transportation or buildings) would likely yield much larger emissions reductions[5]. Perhaps this approach should be considered to maximize the environmental benefits achieved.

3. What Happens in a Pace that is too fast?

AMPCO supports the arguments advanced by the IESO and others that suggest a very rapid ban on gas-fired generation cannot be pursued for reasons of electricity reliability and affordability[6].

In addition to the increased electricity costs associated with pursuing such an approach, one must also consider what those increased costs will do to Ontario industry and its ability to attract investment capital. Electricity pricing in Ontario is currently uncompetitive as compared to other jurisdictions. Further price increases will broaden that competitiveness gap, further reducing the amount of investment that Ontario industry will attract. Ultimately, many industrial participants may exit the province which will tend to put downward pressure on Ontario demand. While this may (incorrectly) be heralded by some as a positive step in conservation, it will actually

[4] Ibid
[5] Or rather than compelling the spending of $27B, to think about a more reasonable yet prudent timeline to better achieve balance between affordability, reliability, and reducing GHG emissions.
[6] See IESO Gas Phase-Out Impact Assessment Report at https://www.ieso.ca/en/Learn/Ontario-Supply-Mix/Natural-Gas-Phase-Out-Study

represent a reduction in GDP for the province, in much the same way as occurred during the financial crisis of 2008/9.

Further to this, the demand for the industrial output that used to be produced by industry in Ontario will not have disappeared – only the Ontario industrial facilities themselves will have done that. Instead, that demand will be satisfied by facilities in other jurisdictions – jurisdictions that do not have electricity systems that are as clean as Ontario's currently is and/or jurisdictions whose environmental standards may be lower. So in this situation, while Ontario may not be producing as much GHG emissions as before, these other jurisdictions could be producing more as a result of increased demand for their output. This phenomenon of "carbon leakage" will result in a net increase in the total amount of global emissions, and such emissions do not respect provincial or international boundaries. So while Ontario may have cut its emissions (at an exorbitant cost), global emissions may, in fact, have increased because production will have shifted to relatively "dirtier" jurisdictions – a catastrophic environmental and economic outcome for the province. This potential outcome adds weight to the need for Carbon Border Adjustments, a subject possibly better pursued at the federal level, but still a critical consideration for the IESO in considering Ontario's electricity supply versus other jurisdictions. To some extent, pursuit of such adjustments can help permit pacing to proceed at Canada's / Ontario's discretion and to blunt the economic and environmental impacts that will arise in the absence of such a construct.

4. What Happens in a Pace that is too slow?

Paradoxically, setting a pace that is too slow may also cause problems. Many industrial entities have already endorsed the notion of decarbonization, and have publicly stated their intentions to achieve that state themselves by a certain timeframe. If Ontario's pace is set too slow, such entities may hesitate to invest in a jurisdiction that does not appear to be acting in a reasonable fashion, and at a reasonable pace. A similar reduction in GDP could occur, with a similar chilling effect on the provincial economy.

Of course, in contrast to this stands the issue of energy independence, a subject that sadly has moved to the forefront of minds as a result of recent world events. Such events add considerable weight to the general need for reliability and self-reliance over sustainability when considering the electricity system.

5. Achievable Levels of Electrification.

Most large industrial facilities require both electricity and natural gas as components of their total energy needs. In many cases, electricity needs are smaller than natural gas requirements.

Theoretical industrial electrification is easily understood - simply replace natural gas with additional electricity. In practice, it is considerably more difficult:

- In some cases, the equipment or process technology does not currently exist to simply convert from gas to electricity.
- In some cases, the conversion from gas to electricity may not be economic. Typical industrial equipment lives are measured in decades and replacing them before it is economical would be a major financial obstacle for most entities.
- Where gas is burned purely for heat it may be possible to convert directly to electricity. Where gas is burned as a chemical feedstock, it is not likely possible to convert directly to electricity.
- Conversion from gas to electricity will place a major strain on the Ontario electricity system. Ontario is already entering a period of reduced capacity, even with zero incremental electrification. Many large industrial entities currently satisfy more of their total energy need from natural gas consumption than they do from electricity usage. Full conversion to electricity (from a mathematical perspective, of course – no commentary here on how possible this is) could mean two to three times as much electricity is now required to operate a given facility – with absolutely no increase in industrial output. If each large industrial facility were to double or triple its electrical load as a result of electrification,

significant new sources of generation would be required to meet the demand. Within the context of P2D, it is unlikely that gas fired generation (likely one of the quickest incremental sources of significant energy) would qualify. Further, with the uncertainty surrounding gas in Ontario, it is unlikely that any such projects could even secure financing, and if they did, prices charged would have to be exorbitant to account for the incremental risk and the likelihood that the equipment would be decommissioned long before the end of its useful life. This situation clearly extends the difficulty associated with industry's ability to attract capital to others as well, in this case new generation resources due to regulatory uncertainty. This is a difficult situation to be in – a significant increase in demand combined with a significant decrease in the qualified generation technologies available to meet it. A reliable, affordable solution seems unlikely.

All of this highlights the difficulties associated with major industrial electrification. Somehow, the IESO's modelling needs to consider all this.

6. Electricity versus the Economy, in General.

AMPCO notes that the IESO has included various assumptions in its modelling that are outside the realm of the electricity system (i.e. buildings and transportation). This is likely reasonable since what happens in one sector will influence what happens in others.

While AMPCO does not make a particular recommendation in this area, it is aware that while electricity is the area of primary interest to the IESO (rightfully so), other areas are likely going to be equally or more impactful on the economy as a whole and will be the focus of many stakeholders. Related to this, it almost appears in the existing discussions that municipalities (used to represent those who are adamant about early off-gas generation) are attempting to address a climate change issue that involves electricity, whereas the IESO is responding with reference to an electricity

issue that is a limited contributor to climate change. These two things are different, and need to be recognized as such.

Ontario must take action to confront the climate crisis – AMPCO understands this. But in so doing, it would be unfortunate if our actions gave rise to a massive economic crisis, with societal impacts just as real and undesirable as the forecast impacts of global climate change. This potential outcome demands that prudence drive decisions, not emotion or conjecture.

Ontario can and should set an example in its behaviour and its regulation. But that example must reflect a reasonable balance between the environment and the economy since neglect of either one can have catastrophic consequences.