

This response to the IESO's CDM mid-term review is being sent on behalf of the Ontario CHP Consortium, a diverse group of LDCs, gas utilities, technology/service providers and customers committed to advancing high-efficiency Conservation Combined Heat and Power (CHP) in Ontario, for which QUEST – Quality Urban Energy Systems of Tomorrow serves as the secretariat.

1. Have the expected outcomes of delivery efficiencies and customer convenience been achieved through collaborative efforts undertaken to date? (Collaboration between LDCs and between LDCs and gas utilities)

Draft Response:

Members of the CHP Consortium, including LDCs, gas utilities and technology/service providers have participated in collaborative efforts in the past that have achieved delivery efficiencies and improved customer convenience. The members of the CHP Consortium have been and continue to be committed to working collaboratively with all organizations. We have provided information and feedback to IESO staff on customer experiences, for example the CHP Consortium facilitated direct customer input on the development of a 3rd party contract providing improved customer flexibility for moving projects forward.

There are however certainly areas for further improvement, and **the CHP Consortium offers to put the IESO and Navigant staff directly in contact with a range of subject matter expert consultants and CHP customers as part of market research efforts to better understand the drivers and barriers of implementing conservation CHP projects, as well as the non-energy benefits.**

2. Are the views of interested stakeholders adequately being reflected in the Conservation First Framework (CFF) and Industrial Accelerator Program (IAP) decision-making?

Draft Response:

Many CHP projects have gone forward via the CFF and IAP, and the system is working. The IESO and LDC community have addressed customer and technology/service provider concerns and as a result, Conservation CHP projects are making a significant contribution towards achieving peak demand reduction and conservation objectives of the CFF and IAP.

However, we are concerned with how Conservation CHP will be treated going forward. There is an opportunity for the IESO to further engage with stakeholders on the CFF and IAP as it relates to the analysis and assumptions used in measuring performance and greenhouse gas (GHG) emissions of Conservation CHP. **The CHP Consortium formally requests a meeting with the IESO and Navigant staff responsible for the GHG analysis, to compare notes, and share assumptions and methodology with the aim of developing a commonly accepted practice for estimating GHG emissions.**

As recommended by the Environmental Commissioner of Ontario in their recent Conservation report *Every Joule Counts*,¹ Conservation CHP offers many benefits to customers, ratepayers and the electricity system and, "More work is needed by the Ministry of Energy and the IESO to

¹ Environmental Commissioner of Ontario (ECO), *Every Joule Counts* (2017). <https://eco.on.ca/reports/2017-every-joule-counts/>

assess the impact of CHP on the province's overall emissions, in light of Ontario's existing electricity supply and its projected supply mix in the future.”

3. How can the opportunities for further integration of CDM solutions in the regional planning process be encouraged from various stakeholders?

Draft Response:

CDM technologies and approaches such as Conservation CHP provide peak demand reduction and electricity conservation outcomes. As the regional planning efforts are focused on identifying reliable, low cost and low GHG solutions, Conservation CHP and other CDM efforts should be encouraged and prioritized in regions where they can defer costly transmission and distribution investments, and where the grid relies on costly and more GHG intensive central gas plants.

4. Should aspects of the CFF and IAP be adjusted in light of Ontario's climate change policy objectives? If so, how?

Draft Response:

Ontario has drastically reduced GHG emissions from electricity generation through the coal phase-out. Further efforts from a climate perspective should be focused on addressing the residual GHGs from less efficient, centralized gas plants. These represent Ontario's costliest and most polluting sources, and they are often run at a fraction of their rated capacity, when efficiencies are very poor – resulting in higher GHGs per kWh than quoted in the climate summary report, along with higher particulate matter and other pollutants with significant health impacts. Because Conservation CHP provides firm peak reduction and electricity conservation, it is one of the few CDM programs that actually helps reduce the run-time for the centralized gas plants.

Conservation CHP systems are designed to be running during peak hours. They are extremely reliable, and maintenance can be scheduled during off-peak hours. As a result, investing in Conservation CHP results in a firm peak demand reduction. Therefore, CHP supports the deployment of new technologies (including electrification), by creating capacity on the existing electricity grid, and reducing the capital required for new incremental infrastructure. As a reliable and resilient power source, Conservation CHP is also a powerful and low cost enabler of GHG reducing wind, solar and other intermittent renewables.

5. What are the implications for customers with the introduction of Ontario's climate change action plan?

Draft Response:

The CHP Consortium supports including a range of CDM technologies and approaches that can achieve conservation demand management objectives, including Conservation CHP.

Subject matter expert members of the CHP Consortium have carefully reviewed the Climate Change Summary report and have specific comments and suggestions we would like to review in greater detail with the IESO, Ministry of Energy, and other staff involved in the CDM mid-term review:

- As noted on Slide 1 of the updated Climate Summary report, a caveat has been added to slides 14 and 53 that states: “if Combined Heat and Power offsets grid-electricity, it would be considered higher-emitting.” This statement is only true if grid-electricity is

lower-emitting than Conservation CHP, and there are many hours of the year when grid-electricity is higher emitting. For example, at 10 pm on the evening of this submission on September 21, 2017, 24% of Ontario's 19,000 MW are being supplied by centralized gas plants, which supply power at much lower efficiencies and with higher GHGs than Conservation CHP. Every hour that Conservation CHP facilities run coincident with these less efficient centralized gas plants, CHP reduces Ontario's GHG emissions. And these centralized gas plants run the majority of hours per year.

- On slide 28 there is a GHG avoided per MWh metric, where the insight box states that the avoided GHGs are calculated net of any increases in GHGs due to Conservation CHP projects. However, it is not clear how these emissions are calculated, and the Consortium requests increased transparency in terms of the methodology and assumptions used in these calculations.
- Slide 32 identifies that a review of the metrics used in the assessment of GHG emissions reductions is part of the CDM mid-term review process. The CHP Consortium requests the opportunity to participate in and provide input to these discussions and review process.
- Slide 35 includes a statement acknowledging that GHGs from Ontario's grid-electricity will increase relative to 2017 levels, based on increased reliance on centralized gas plants. The CDM program should be encouraging Conservation CHP because it will be a lower emitting option as the centralized gas plants increase their contribution to Ontario's grid-electricity. Conservation CHP can therefore contribute to achieving Ontario's short term GHG reductions part of the reason QUEST and the CHP Consortium are supportive of Conservation CHP in Ontario.
- There is a consensus view² that the emissions from Conservation CHP should be compared to a marginal grid emissions factor, as identified on slide 44's mention of an EM&V report that calculates avoided GHGs based on the marginal resource. This raises the question of why an average grid emission factor is presented on slide 53 of the climate report. The difference between emissions on average and emissions at the margin is not insignificant and if we want CDM and climate policies to work as intended then what is needed is clear, commonly accepted guidance on how to calculate the impact of Conservation CHP and other CDM measures on emissions from grid-electricity.

Environmental Benefit of CHP

- As noted by the IESO, MOE and MOECC, CHP is an energy efficient electric CDM measure and has a high impact on peak demand reduction. Ontario is going to have natural gas as the source of generation at the margin for at least the next 10 to 20 years. Because CHP is displacing peaking power generated from inefficient natural gas-fired power plants and eliminating line losses, CHP reduces GHGs. Based on IESO data, the recently published OPG Intrinsic report,³ and our internal analysis, every new MW of installed CHP reduces about 1,000 tonnes of Ontario's GHG emissions a year. We know

² This consensus is based on conversations we have had with energy and emissions subject matter experts at the IESO, Ministry of Energy, Environmental Commissioner of Ontario and Toronto Atmospheric Fund, as well as all the LDC members of the CHP Consortium.

³ Intrinsic GHG report from various methods of power generation in Ontario, for OPG:

http://www.opg.com/darlington-refurbishment/Documents/IntrinsicReport_GHG_OntarioPower.pdf

this because CHP results in at least a 20% reduction in natural gas use compared with a business as usual scenario (BAU) using boilers and gas-fired generated grid power. As long as natural gas powered plants are running as the marginal source of generation, CHP facilities reduce GHGs.

- CHP provides a key pathway to reduce GHGs to meet Ontario's climate change commitments, including long term, potential large reductions of tens of megatonnes out to 2050 based on CHP, district energy, and an expanded thermal network based on renewable and carbon neutral sources of energy, including renewable natural gas.
- Ontario will require increased natural gas power generators to fill the electrical generation shortfall during nuclear refurbishment. This will require the natural gas portion of electricity production for Ontario to go from 9% to 18% as per the OPG Intrinsic report. Conservation CHP will help Ontario manage that supply gap more effectively, with higher efficiencies than large centralized natural gas peaking plants, reducing electricity prices and overall GHGs. Removing CDM incentives will lead to customers relying on simple cycle natural gas or diesel fired generators to shave peaks and reduce global adjustment charges, which will result in higher emissions over the longer term and not achieve the same long term economic benefits provided by CHP.

Resilience Benefit of CHP

- An increased number of decentralized CHP units diversifies and enhances grid resilience and better prepares individual communities and the province for grid outages and emergencies.
- CHP provides additional resiliency to allow for business continuity, including the protection of property and occupants, during weather-related and other types of utility power interruptions. CHP plant reliability is very high due to both the reliability of the buried natural gas service and the financial requirement for frequent or continuous operation of the CHP plant.
- In the case of hospitals, improved resiliency from CHP has a direct patient safety benefit, as patients are very vulnerable to total power failures. There are a number of documented cases of hospital emergency generator plants failing during major weather (and utility power failure) events and patients having to be evacuated to other facilities - at significant risk to the patients. These hospitals and long term care facilities require space heating and hot water for bathing, laundry, sterilization, and other uses and CHP is the only technology that provides reliable and resilient heat and power.
- The frequency and intensity of extreme weather events are predicted to increase. Just recently the US department of Energy's Energy Efficiency and Renewable Energy division highlighted the critical role CHP played in keeping the Texas Medical Centre - the largest health facility in the world - operational throughout Hurricane Harvey. While we may not have hurricanes in Ontario, we are subject to ice storms, flooding, tornados, and electromagnetic storms, and many communities such as Halton and Toronto, and organizations such as YMCA and Toronto Community Housing are counting on Conservation CHP as the energy foundation for establishing reliable and resilient Public Emergency Response Centres. CHP supplies long-term, critical power to keep residents in buildings safe and comfortable during prolonged outages, compared with diesel-fired backup systems that are designed to supply short term power to evacuate residents.

The members of the CHP Consortium strongly recommend that the IESO and the Government of Ontario carefully consider the benefits of Conservation CHP as part of the CDM mid-term review.

Doing so will directly support the government's conservation objectives of providing energy affordability, customer choice and value, addressing peak demand, reducing greenhouse gas emissions, and improving resiliency in communities across the province.

Representatives of the CHP Consortium are very interested in meeting with the IESO, Ministry of Energy, Navigant and others involved in the CDM mid-term review process to discuss our submission in greater detail. We look forward to hearing from you and helping to advance CDM objectives in Ontario.



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