February 11, 2019

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Re: District Energy and the Federal Carbon Pricing System

Dear Mr. Moffet and Ms. Teeple:

Thank you for the opportunity to provide further comments regarding the Government of Canada's design of the federal carbon pricing backstop system. We appreciate your continued openness to dialogue and engagement, and trust that the matters raised herein will be given serious and timely consideration.

During our meeting on November 30th in Ottawa, you welcomed information, in addition to the letters of August 7th and October 5th, that further explains why the thermal output of district energy systems should be included as a covered sector under the Output Based Pricing System (OBPS). This letter is our response. It will also form the basis of our submission prior to the February 15th comment deadline on the information released on December 20th.

In our previous letters we presented the societal benefits of district energy, including reducing greenhouse gasses (GHGs), lowering energy costs, increasing resilience and supporting long term sustainability. We noted that the United Nations has identified district energy as a "most effective means to de-carbonize urban infrastructure" and that district energy is a priority for Canada's largest cities, including Toronto. We stressed that despite these advantages and this widespread public policy support, adoption rates are lagging due to market factors like technology adoption rates and building-owner budgetary priorities.

We will not re-hash these points in this letter but remain eager to provide any related additional information that may be helpful in your deliberations. This letter will instead focus specifically on the four factors that we believe justify the inclusion of the thermal output of district energy systems under the OBPS.

1. Canada must transition gradually to a new energy future.

The Intergovernmental Panel on Climate Change (IPCC) has consistently reported that holding climate change below a two degrees Celsius temperature rise requires, over time, decarbonizing electricity production and electrifying virtually everything, including transportation, industrial processes, heating and cooling.

In its most recent report released in October, 2018, titled *Global Warming of 1.5˚C*, the IPCC notes that "economic, institutional and socio-cultural barriers may inhibit these urban and infrastructure system transitions, depending on national, regional and local circumstances, capabilities and the availability of capital."

Change is difficult, especially at the pace and scope required to avoid catastrophic climate change. Energy consumers are resistant, in part because they are uncomfortable with newer technologies and also because natural gas is significantly cheaper than electricity at present, especially for thermal applications.

The recent experience of policy-makers in Ontario illustrates the challenge. Provincial electricity rates have doubled in the past ten years. Energy consumers have shown a strong resistance to policies aimed at pushing the market towards electric space heating. In May, 2016, a draft Ontario climate plan was leaked that contained strong targets for moving off of natural gas heating. The draft plan called for all new homes to use electric heating by 2030, and for all buildings to be electrified by 2050. This plan faced stiff public opposition and was quickly withdrawn by the government of the day. The public is wary of short-term, widespread 'forced' electrification.

Like consumer behaviors, energy systems are also resistant to change. Upgrading wires, transformers and substations to handle rapidly growing loads is expensive, perhaps prohibitively so. The federal Minister of Transportation, the Honourable Marc Garneau, recently announced Canada's targets for electric vehicles: 10% of new light-duty vehicle sales by 2025, 30% by 2030, and 100% by 2040. If even a fraction of these ambitious targets is met, the electricity grid will be under significant strain to meet the required load. Rapid electrification will require massive investments in the system that will further increase electricity costs in the short term.

Pressure to move away from natural gas for space heating will further compound the issue. A well-regarded 2015 report titled *Pathways to Deep Decarbonization in Canada* reveals that for Canada to achieve deep decarbonization by 2050, the electricity sector would have to expand by up to 600%. Furthermore, a 2018 report by The Atmospheric Fund, in collaboration with MaRS, Enbridge, Natural Resources Canada and others, found that purely electric heated homes (via heat pumps) would increase electrical peak from about 7 to 8 kilowatts (kW) to 13 kW just for heating. Spikes in both total demand and localized peaks will require significant infrastructure upgrades. Electricity customers will be expected to shoulder the burden of these investments.

Federal officials have stated publicly that the inclusion of electricity under the OBPS is driven by two primary considerations: minimizing the impact to ratepayers and sending a price signal to infrastructure owners and investors. The same logic should apply to natural gas customers, especially those with constrained budgets and large annual energy expenditures. It is anti-competitive to favour one energy type over another. We feel strongly that the federal carbon pricing system not choose energy winners and lowers and instead send a uniform carbon pricing signal that informs decisions.

Absent this equitable treatment, the federal carbon pricing system as currently proposed adds significant costs to energy usage by municipalities, universities, schools and hospitals (the MUSH sector) as well as commercial buildings. Owners are facing rising natural gas costs on the one hand and potential electricity cost increases on the other as fuel-switching occurs at scale. They are caught between the rising costs of the status quo and an expensive short-term transition to electricity.

Fortunately, district energy systems provide an alternative – a third way forward. It is a systems approach that drives improved energy efficiency at a large scale in the short-term while enabling fuel switching over time. It is the 'interim step' that Canada needs to put the built environment on a sustainable pathway of decarbonization.

2. <u>District Energy provides an effective pathway that energy consumers support.</u>

Rather than aim to drive short-term fuel switching (which we believe is unlikely to happen), the federal carbon pricing system should be designed to incent energy efficiency at a bulk scale. District energy systems give the MUSH sector and commercial buildings a pathway to meaningfully mitigate carbon costs by moving to a more efficient, resilient system today.

Carbon pricing applied to the MUSH and commercial buildings sector will create a small additional incentive for building owners to move to district energy systems. If less natural gas is required for the same thermal output, carbon costs will be avoided. However, at $20 to $50 per tonne there will not be enough incentive to effect widespread change. Even at $50 per tonne of CO2e, the additional cost is only 9.79 cents per meter cubed of natural gas. This does not close the pricing gap between cheap natural gas and relatively expensive electricity. Building owners will simply pay more for their usual energy consumption.

District energy systems typically offer a 5% to 15% energy efficiency improvement over conventional single-building systems, not including opportunities for fuel switching and the integration of clean technologies like Enwave's Deep Lake Water Cooling system. While this provides a carbon cost advantage over traditional single-building boiler systems, it will not be sufficient to incent wide-spread movement to district energy systems.

If, however, district energy systems are included as a covered sector under the OBPS at 80% emissions coverage, building owners would avoid all but 1.9 cents per m3 of the total carbon charge (at $50 per tonne CO2e).

MUSH sector and commercial building owners would have the means by which to avoid the most punishing energy cost escalations. By joining a district energy system they would save money, improve their energy efficiency, reduce emissions, and join a collective system that will enable deep decarbonization over time.

3. District energy enables fuel switching at scale and reduces peak power demands on the grid.

A key advantage of thermal networks compared to individually heated and cooled buildings is that networks make fuel switching more cost-effective. By aggregating the thermal energy requirements of dozens or even hundreds of customer buildings, district energy systems create the economies of scale necessary to integrate local, low-carbon/renewable energy sources (e.g. lake water cooling, geo-exchange, solar thermal, sewer heat, biomass, waste heat capture, etc.) in order to achieve large-scale, cost-effective emission reductions that individual homeowners and buildings cannot achieve individually.

Buildings served by district cooling systems typically avoid 50%-60% of the peak electricity power demand of traditional in-building air conditioning systems, alleviating negative impacts on regional power grids, reducing potential for brown-outs and displacing expensive, dirtier peaking generation during extreme summer heat.

Additionally, a district energy system can represent a single, large consumer of renewable fuels like bio-methane, bio-diesel, renewable or sustainable natural gas either at the burner tip or as a downstream customer to facilitate injection into a natural gas distribution system. For example, Princeton University in the United States tested low-carbon bio-diesel as an alternative to natural gas-firing at a 15 MW campus cogeneration facility, effectively fuel-switching one primary energy generator to convert 140 buildings to lower carbon energy, rather than the costly and time-consuming effort to replace equipment in 140 separate building systems.

The Government of Canada has recognized the valuable role district energy systems can play in enabling fuel switching. As part of the Energy Services Acquisition Program (ESAP), Public Works and Government Service Canada has undertaken a project to renew the seven plants that provide heating and cooling to more than 100 buildings in Ottawa's downtown core. The listed benefits of the project include reducing energy costs for the government, increasing the safety and reliability of the plants, and improving the government's environmental performance by reducing greenhouse gasses. The GHG reductions will come from implementing more efficient technologies between now and 2025 to replace old equipment, and by fuel switching to carbon neutral energy thereafter.

Industrial heat pumps, the integration of wind, solar and geothermal energy, deep lake water cooling technologies – each presents an opportunity to decarbonize the built environment. District energy

systems are the means for carrying it out at scale and at a pace that energy consumers are comfortable with.

4. The organic growth of district energy is insufficient and must be accelerated.

The growth of district energy in Canada has been slow, despite the broad support by technologists, climate scientists, city planners and policy makers. The latest data shows 178 district energy systems in operation across Canada, 44 of which each produce more than 10,000 tonnes of CO2e per year. These 178 systems service almost 3,000 buildings across Canada and deliver 5.9 terawatt hours of thermal energy per year. While this sounds significant – and it is – it accounts for only about 0.24% of total secondary-use energy, based on Canada's 2013 energy demand.

To enable Canada's energy transition, the deployment of district energy should be encouraged. This is being recognized by government across Canada. For example, the federal government, led by Environment and Climate Change Minister Catherine McKenna, recently announced a $10 million investment in Enwave's Deep Lake Water Cooling system

While these one-off investments are certainly welcome, a much more sustainable strategy is to use legislative tools, like the federal carbon pricing system, as a means to drive widespread energy system change and create effective tangible policy incentives to support cities, communities and campuses seeking to deploy district energy systems for enhanced resiliency, carbon reduction and economic competitiveness.

Inclusion of district energy as a covered sector will provide a primary market signal and alleviate the need to invest federal funds to incent wide-scale district energy system deployment. Instead of collecting revenues and then re-investing them back into energy systems, the Government of Canada has before it an opportunity to design a system that incents the desired societal outcomes.

Absent a long-term policy tool, we feel strongly that the positive attributes and contributions made by district energy deployment in rapidly de-carbonizing countries like Denmark, Finland, Sweden, Norway and Germany will not only be lost for Canada, but may actually be harmed and discouraged.

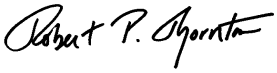
Conclusion & Next Steps

It remains our position that district energy systems are good for Canada and good for Canadian building owners. We must move the MUSH sector and commercial buildings to district energy systems quickly and at a massive scale if we are to achieve Canada's climate commitments. There is simply no getting around this fact.

The federal carbon pricing system is a policy mechanism that can expedite this change. We implore the Government not to miss this opportunity to set Canada's buildings on a realistic and achievable path to decarbonization. Inclusion will help the MUSH sector and commercial building owners manage carbon cost in the short term while enabling a successful energy transition for our local economies.

Thank you for your continued attention to this matter. We would welcome the opportunity to discuss this matter in greater detail. The undersigned are prepared to come to Ottawa to meet in person and will follow-up to inquire if there is a date and time that might work.

Yours sincerely,



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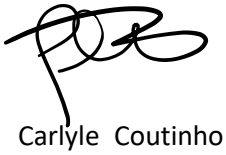

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The **International District Energy Association (IDEA)** is a 501(c) (6) non-profit industry association founded in 1909 with headquarters near Boston, MA, USA. IDEA represents nearly 2,400 members from 26+ countries around the world, with a majority in North America. IDEA members own, operate, design and optimize district energy systems that supply steam, hot water, chilled water and energy services to multiple buildings in cities, communities, campuses, airports, military bases, industry and healthcare. Working with global partners, IDEA specializes in highly reliable and resilient thermal networks, combined heat and power, thermal storage, microgrids and clean energy management to optimize energy efficiency, reduce harmful emissions, and provide sustainable solutions for mission-critical and community-scale markets.

QUEST is a national non-government organization that works to accelerate the adoption of efficient and integrated community-scale energy systems in Canada by informing, inspiring, and connecting decision-makers. The organization commissions research, communicates best practices, convenes government, utility, and private-sector leaders, and works directly with local authorities to implement on-the-ground solutions. QUEST recognizes communities that have embraced these principals by referring to them as Smart Energy Communities.

Enwave Energy Corporation is the largest core-competency district energy provider in North America and an industry leader in providing innovative, sustainable energy solutions. A private corporation owned by Brookfield Infrastructure Partners and its institutional partners, Enwave has assets in Toronto, Chicago, New Orleans, Houston, Las Vegas, Los Angeles, Seattle, Portland, Windsor, London and Charlottetown. In each community, Enwave operates intelligent thermal energy systems that generate, store, and share energy across the district.