141 50 Ave SE
Calgary, AB, T2G4S7
403-514-3000

August 4, 2016

Standing Committee on Finance

c/o: Suzie Cadieux, Clerk of the Standing Committee on Finance

Re: Written Submission of ENMAX Corp. to propose measures in relation to climate change adaptation

Executive Summary

ENMAX Corporation is a wholly owned subsidiary of The City of Calgary, headquartered in Calgary, Alberta. ENMAX's vision is to be Canada's leader in the electricity industry through its mission of powering the potential of people, businesses, and communities by safely and responsibly providing electricity and energy services in a way that matters to them now and in the future. ENMAX and its predecessors have a proud history of providing Albertans with electricity for over 100 years, and are leaders in exploring ways to improve the province's electricity system and providing progressive solutions for its customers.

As one of Alberta's leading power generators, ENMAX is pleased to present its written submission to the House Finance Committee's pre-budget consultation process in advance of the 2017 budget. Specifically, we would like to suggest measures in relation to climate change adaptation that would help communities to support residents and businesses as they seek to take advantage of opportunities and contribute to the nation's economic growth.

As a leader in providing progressive energy solutions, ENMAX believes that the federal government has an opportunity to play an increasing role in building Canada's climate change adaptation infrastructure as well as building the funnel of clean energy technologies, particularly at the scale-up stage of new technologies to accelerate their commercialization, adoption, and integration. The measures proposed below will result in more clean and efficient energy generation technologies and facilities.

ENMAX requests a non-repayable contribution totaling $26.5 M to accelerate and de-risk three major climate change adaptation projects in Alberta. More generally, ENMAX believes renewable energy generation solutions such as District Energy and its Community partnership approach are models for other Canadian communities and corporations to, in very practical ways, reduce greenhouse gas emissions on a large-scale while continuing to support economic growth in a sustainable way. We believe funding of the nature requested for ENMAX in Alberta should also be made available to communities and corporations across Canada as it will altogether increase the likelihood that Canada as a whole will meet the climate change targets established over the past year internationally.

Large-scale financial support from the federal government has proven success in accelerating District Energy in Calgary, and will be critical to assist, de-risk, and accelerate the efforts of communities and corporations across Canada. Without this support, communities and corporations will be challenged to meet the greenhouse gas emissions targets of the federal and provincial governments.

141 50 Ave SE
Calgary, AB, T2G4S7
403-514-3000

Specific Project Details

The following represents a list of shovel ready projects ENMAX is able to implement immediately with additional support from the federal government. We offer these projects not only for consideration by the federal government, but also as examples of projects that could also be implemented by other communities across the country. As a regular contributor to inquiries from Municipalities across Canada, ENMAX will continue to lead and encourage proliferation of District Energy systems as a critical climate change mitigation strategy.

Project Example #1: District Energy for Downtown Edmonton

ENMAX is requesting a non-repayable contribution of $9.0M, as an incentive to accelerate and de-risk the building of a district energy facility for the City of Edmonton. This is a one-time program funding request to be administered by ENMAX with future phases being self-funded. The total project cost is approximately $50 M of which $37 M will be funded by ENMAX and $5 M by EPCOR. No additional infrastructure funding is anticipated.

Capital Required: one time investment of $9.0M to complete total facility development costs of $50.8M. The remaining budget of $41M has been approved by ENMAX ($37M), EPCOR ($5M), and the City of Edmonton ($0.8M + Real Estate).

Environmental Benefit: The project is estimated to reduce GHG emissions by 94,000 tonnes per year at full build-out. The District Energy and Combined Heat & Power (CHP) units will be contributing power to the grid effectively displacing a portion of current coal fired generation.

Employment Benefits: 115 FTE positions in green jobs over 24 months for facility build-out and an additional 12 permanent operating jobs.

Economic Benefits: 30MW of District Energy connection(s) results in a total of more than $47.0M of direct capital spend.

Social Benefit: The project aligns with the unanimously approved City of Edmonton Community Energy Transition Plan with District Energy forming a strategic component of the execution strategy. Critical to note, City council has agreed to take the necessary steps to allow the project to proceed (rights-of-way, District Energy central plant location, and connection to Municipal Buildings, etc.) and on July 6, 2016 approved financial support for the Design Basis totaling up to $800,000.

The project identifies several provincially owned buildings and over 30 privately owned buildings as candidates for connection during the initial build-out of Edmonton District Energy. The connection of these properties provides an opportunity for the City to further its commitment to the District Energy system and to being a leader in urban, sustainable energy generation.

141 50 Ave SE
Calgary, AB, T2G4S7
403-514-3000

In support of the City of Edmonton's sustainability initiatives, City Council has been proactive and shown strong leadership by:

- Committing Municipal buildings to connect to, and become customers of, the District Energy system where practical
- Unanimously approving the development of a downtown District Energy system
- Committing real estate/land for the District Energy central plant location
- Providing access to underground LRT pedways for installation of the Thermal Distribution System (TDS) pipeline
- Approved $800,000 to be used to complete detailed design of the project including the District Energy central plant, CHP plant and TDS and to bring the initiative to its physical development launch.
- District Energy central plant design specifications
- Identifying the location of the Central Plant
- Optimal TDS pipeline routing within the city's underground pedway tunnels and in-street
- Identification and profiling of specific municipal and provincial buildings for connection in Phase I and II

ENMAX has:

- Already invested development costs in excess of $500,000 consisting primarily of engineering, preliminary design of District Energy central plant location, pipeline routing and identification and commitment of specific buildings for connection.
- Promoted District Energy across Canada as a critical component for mitigating climate change

EPCOR has:

- Committed to the capital investment required for pipeline development
- Committed to work with all parties to ensure seamless construction

There is strong and successful precedent for Infrastructure support for this kind of project. In 2007, $20.0M was granted by the Canada Alberta Municipal Rural Infrastructure Fund (CAMRIF) for the ENMAX District Energy Centre located in downtown Calgary. The project was commissioned in 2010, and sold out in 2014, with additional supply added in 2015, and the plant will once again be sold out by Q2 2016 requiring additional supply. The successful development of the ENMAX District Energy Centre in Calgary was largely dependent on the CAMRIF funding. This development has resulted in over 20 permanent jobs, hundreds of Engineering, Procurement and Construction jobs and capital investment nearing $100.0M. Connected buildings (14 to date) include large and medium commercial buildings, low income senior residences, and a post-secondary institution.

141 50 Ave SE
Calgary, AB, T2G4S7
403-514-3000

This project demonstrates a collaborative effort between ENMAX, EPCOR, and the City of Edmonton, to employ the most efficient approaches for heating and power large buildings, and, we believe, is a model for communities across Canada.

Project Example #2: District Energy System Expansion for Downtown Calgary

ENMAX is requesting a non-repayable contribution or low cost financial instruments of $15.0M, as an incentive to accelerate and de-risk the expansion of the City of Calgary Downtown District Energy project. **This is a one-time program funding request to be administered by ENMAX with future phases being self-funded.** ***The total pipeline project cost, including incremental thermal generation, is approximately $47.0M, $32.0M of which will be funded by ENMAX.*** **No additional infrastructure funding is anticipated.**

Capital Required: one time investment of $15.0M to support system heating pipeline expansion. The remaining budget of $32M has been approved for the project already.

Environmental Benefit: ~22,800 tonnes of CO2e per year or 684,000 tonnes over the life span of the project. Traditional, in-building, boilers experience 70-75% efficiency over the asset's lifetime. Calgary's District Energy's central plant can expect to experience 85+% efficiency do to the inclusion of CHP generation, high efficiency boilers and a proactive maintenance program.

Employment Benefits: 55-80 FTE positions in green jobs over 12-18 months for TDS construction. *(An additional ~100-150 FTE's for the related boiler and CHP expansions.)*

Economic Benefits: 30MW of District Energy connection(s) results in a total of more than $47.0M of direct capital spend.

Social Benefit: Provides municipalities with long-term price certainty over a portion of their energy; Increases green energy production and proliferation of Public and Private Investment.

Expanding customer demand (from Customer buildings requiring boiler replacement) for District Energy will require additional subterranean thermal transmission pipe along 9th Ave which will complete the initial pipeline loop commissioned in 2010. This new pipeline investment will enable up to 5 million sq. ft. (6+ large buildings) of real estate to connect to the District Energy system and allow for additional, network-wide, efficiencies. As with the initial pipeline build out in downtown Calgary, and by adding to the existing District Energy network, the new pipeline infrastructure investment will achieve profitability as buildings are connected over time. The criticality of timely action is to have the TDS infrastructure in place when boiler replacement(s) are required in the identified buildings.

141 50 Ave SE
Calgary, AB, T2G4S7
403-514-3000

With the 9th Ave pipeline loop complete, ENMAX will invest capital to expand efficient thermal generation capacity. This expansion will include the addition of ~30MW of capacity including ~20MW of high efficiency boilers and 10MW of CHP.

Project Example #3: Municipal Solar Installation Opportunity

ENMAX is requesting $2.5 M as an incentive for 8-10 communities across Alberta, including Calgary and Edmonton to double the amount of energy generated from solar and would result in more than $13 Million of direct economic activity or a six-times leveraging of government support. The project is ready to go and would be implemented within 18 months from approval.

ENMAX has been actively engaged with a number of municipalities across Alberta regarding solar installations. Currently, the market has largely stalled due to policy uncertainty, and historical low energy prices that make solar un-economic in the near term. It is necessary to invest in solar now, in order to continue the switch over to renewable and clean energy generation.

Currently ENMAX has more than five (5) megawatts (MW) of solar proposals in front of municipal customers awaiting decision to proceed, or not.

Project Potential: 5 MW of grid connected distributed solar across 8 – 10 municipalities (represents a 50% increase in solar capacity in Alberta)

Environmental Benefit: >83,000 tonnes of CO2e over the life span of the projects as per Alberta Offset System emission factors.

Employment Benefit: 30-34 FTE positions in green jobs over 18 months that help to maintain and build capacity in the Alberta solar market.

Social Benefit: Provides municipalities with long-term price certainty over a portion of their energy; Increases renewable energy production at the point of consumption; showcases solar technology on public buildings across the province.

Timing: ENMAX can implement projects immediately as supply chain, system design and construction capacity is in place. ENMAX utilizes a unique small business "Dealer Network" for solar installations, all of whom would benefit directly by stimulating the solar market in Alberta. Each of the seven current ENMAX dealers are small businesses embedded in the communities they work and live in.