

## DOWNTOWN DISTRICT ENERGY INITIATIVE

### Development Update

#### RECOMMENDATION

That an amendment to the Early Works Contract between the City of Edmonton and EPCOR Commercial Services Inc as outlined in the June 29, 2022, Integrated Infrastructure Services report IIS01164, be approved, and that the amendment be in a form and content acceptable to the City Manager.

#### Report Purpose

##### **Committee decision required.**

Executive Committee is being asked to approve an amendment to the Early Works Contract between the City of Edmonton and EPCOR Commercial Services Inc as outlined in the June 29, 2022, Integrated Infrastructure Services report IIS01164, and that the amendment be in a form and content acceptable to the City Manager.

#### Executive Summary

- To provide certainty on capital costs and operating impact, EPCOR and Administration are recommending that this project advance engineering further to gain greater certainty on construction pricing. In order to proceed with this, an amendment to the existing Early Works Contract between EPCOR and the City in the amount of \$1.5 million is required and is within approved budgets.
- The Downtown District Energy Initiative supports City Council's 10-year Climate Resilience objectives, The City Plan and was identified as a "big win action" in Edmonton's Community Energy Transition Strategy.
- City Council approved funding of \$27.9 million for the first phase of the Downtown District Energy Initiative. This includes a Central District Energy Plant located at the Winspear Centre providing electrical and thermal energy to Winspear, Century Place and Chancery Hall.
- The construction of the District Energy Shell Building at Winspear and the design of the District Energy System by EPCOR is underway.

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- As the project has developed, the project team has been mindful of changes in external factors that impact the environmental and economic outcomes of the project - namely a greener provincial electricity grid, increases in material and construction costs and changes to the carbon levy and commodity costs.
- Based on a further review of the impact of these factors on the project, it is recommended that the project scope change from a combined heat and power system (CHP) to a heating-only based system, utilizing boiler technology.
- This change in project scope ensures that environmental and economic goals of the initiative continue to be achieved and confirms the long-term vision of a growing Downtown District Energy System beyond the first phase.
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- As growth opportunities for private and public buildings to connect to a future Downtown District Energy Initiative are becoming more apparent, EPCOR with Administration's support, is developing a master plan for a growing Downtown District Energy system. The intention is that this update will be presented to City Council at the same time as the updated cost information of the initiative's first stage.

### **REPORT**

The Downtown District Energy Initiative supports City Council's 10-year Climate Resilience objectives, The City Plan and is identified as a "big win action" in Edmonton's Community Energy Transition Strategy. On May 25, 2020, as part of the Spring 2020 Supplemental Capital Budget Adjustment (CR\_8009), City Council approved funding of \$27.9 million for the first phase of the Downtown District Energy Initiative. The first phase included a Central District Energy Plant located at Winspear which would provide electrical and thermal energy to Century Place, Chancery Hall and Winspear, including its current expansion project.

On July 22, 2020, EPCOR and the City of Edmonton entered into a Memorandum of Understanding (MOU) that outlines both parties' commitment to the project and necessary steps for joint project development. EPCOR and the City are negotiating the terms of the definitive agreements to design, build, operate, maintain and finance the Downtown District Energy Initiative approved by City Council on February 8, 2021 (CR\_8257). In order to facilitate preliminary design and initial regulatory requirements (including noise impact studies) the parties entered into an Early Works Contract. This Early Works Contract was limited to the City Manager's authority with a maximum expenditure of \$1 million.

With the design work advancing, EPCOR recommended and implemented a change in design intention to provide cooling locally at the building level and not centrally as initially suggested. This does not change the overall design direction to integrate central cooling from the District Energy Infrastructure in the future when the system is expanded and switches over to a lower temperature mode. The reason for this design adjustment came after a more detailed review of the initial heating and cooling requirement of all three buildings (Winspear Centre, Century Place and Chancery Hall) identifying them as significantly heating dominant.

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The construction of the District Energy Shell Building at Winspear is advancing, with an estimated completion date of November 2022.

## Review of changing external project conditions

As part of the continued evolution of the Downtown District Energy Initiative, EPCOR and Administration undertook an exercise to review certain base assumptions made for the project, given that economic and environmental factors have changed over the last year of project development. The use of Combined Heat and Power (CHP) units, for electricity and thermal energy generation, was the key base assumption that was selected for further review. The key external factors which were reviewed, are listed and its impact on the project described below:

- Greening of Alberta's Electricity Grid
  - The intensity of greenhouse gas (GHG) emissions from Alberta's Electric Grid have decreased at a faster rate than what has been previously predicted. The early retirement of coal units in the Province has led to a speedier reduction in the grid emission factor.
  - From the project perspective this means that GHG reduction is equivalent to CHP generated electricity in three to four years and the CHP generated electricity actually becomes more carbon intensive than the grid after that.
- Current Material and Construction Costs
  - The cost of construction materials has dramatically increased since the beginning of 2020. These materials are the building blocks for the District Energy Infrastructure and have a direct impact on construction costs. According to Statistics Canada, prices have accelerated but at varied rates across construction cost components, with available price data indicating more acute price growth for metal products and energy. As an example, according to Statistics Canada's national Industrial Product Price Index, manufacturer prices for fabricated metal products and construction materials were 42.9 per cent higher as of April 2022 compared to January 2020.
  - More specifically capital costs and operating costs have significantly increased for the anticipated combined heat and power units. EPCOR's capital cost estimates for the whole project over the last year have seen an increase of \$6.8 million (approximately a 33 per cent increase). In addition, the operating and commodity costs have increased by \$1.2 million per year, compared to initial estimates prior to February 2021.
- Carbon Levy
  - Subsequent to development of the initial business case, the federal government announced a material increase in the carbon levy. Prior to the announcement the carbon levy was scheduled to reach a ceiling of \$50 per tonne on April 1, 2022, however the current expectation is for further increases of \$15 per tonne on an annual basis until the levy reaches \$170 per tonne on April 1, 2030. The forecast

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price of electric energy already includes the impact of the carbon levy as this is borne by generators and included in their bid price to the power pool. However, for natural gas the carbon levy is an additional expense that will increase significantly over the next eight years, reaching \$8.94 per GJ in 2030.

- This increased carbon tax levy would have a negative financial impact on the cost of operating the CHP unit which uses 100 percent natural gas to generate both electricity and heat.
- **Commodity Costs for Electricity and Natural Gas**
  - Throughout the development of the project there has been a distinct increase in the cost of both commodities affecting the project. However, these commodities have not been impacted equally.
  - The significant increase in the forecast cost of natural gas relative to electricity eliminates the previously quantified financial benefits of providing electricity to the three buildings from the CHP units rather than purchasing electricity from the grid.
  - The increased cost of natural gas also modestly increases the financial benefits of the heating-only scenario relative to the business as usual case due to the natural gas efficiencies realized from a centralized boiler system. However, the annual natural gas and other operating cost savings of a boiler-only scenario are likely reduced relative to the CHP option for the initial three buildings, which requires increased capital costs.

### **Change to Project Scope removing electricity generation and supply**

Based on the changing external factors listed above, Administration and EPCOR jointly recommend moving forward with a heating-only system for phase 1 of the Downtown District Energy Initiative, instead of the integration of the combined heat and power units for additional electricity generation, as originally proposed.

While the original intent of the first phase, to form the basis of the District Energy Initiative for the whole of downtown, remains intact, the recommendation is also aligned with existing commitments to Winspear and to further support Edmonton's Community Energy Transition Strategy.

### **Next Steps and Early Works Contract Amendment**

In order to develop an updated capital and operating budget for the Downtown District Energy Initiative, the Early Works Contract needs to be amended to provide an additional \$1.5 million from the approved budget to allow EPCOR to advance the engineering to gain greater certainty on construction pricing for the project. This work will be completed by the fourth quarter of this year, prior to City Council's 2023-2026 budget deliberations. With optimized design and cost assumptions, a complete picture of any changes to the capital operating impact of the first phase from what was reflected in the original term sheet will be presented in an update to City Council at this time.

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In parallel, the growth opportunities of the Downtown District Energy Initiative have increased as opportunities to connect to the Station Lands development and other City's buildings and private developments have become more imminent. The expectation of the technical and economical feasibility of a growing district energy system in the downtown area is the focus of current work in the initiative. This work will be conducted in parallel with the advanced design work for the first phase of the initiative, so that both outcomes can be presented to City Council during the fourth quarter of 2022.

This information can then provide City Council with a clearer picture of the impact and efforts to further develop the Downtown District Energy Initiative.

### **Budget/Financial Implications**

Integrated Infrastructure Services report CR\_7754, presented to City Council on April 15, 2020, provided the technical and financial analysis for a scaled-down approach for the Downtown District Energy Initiative. Administration recommended a Central District Energy Plant at the Winspear Centre, which includes combined heat and power, and boiler plant, initially connected to three buildings: Winspear, Century Place and Chancery Hall.

- The capital profile (20-83-9001, Downtown District Energy Initiative) was in the amount of \$27.9 million, of which \$11.5 million would be required from the unallocated corporate funding pool available for future emerging capital items (comprised of \$7.0 million for the funding gap and \$4.5 million held in abeyance for the Winspear boiler system), \$2.6 million would be reallocated from existing facility renewal capital funding, and \$13.8 million would be funded by self-liquidating debt repaid through utility customer rates.
- City Council subsequently approved capital profile 20-83-9001 as part of the Spring 2020 Supplemental Capital Budget Adjustment. Under the proposed agreements, the funding sources for the District Energy System's construction remain the same except that EPCOR will finance the \$13.8 million through a combination of debt and equity rather than the City of Edmonton borrowing the \$13.8 million through the Province.
- As discussed on April 15, 2020, Integrated Infrastructure Services report CR\_7754, annual operating costs (uninflated) for the combined heat and power and boiler plant to provide electricity and heating to the three buildings were initially projected at \$1.5 million, compared to \$2.0 million of electricity and heating costs (energy bills and maintenance costs) the three buildings would otherwise incur under the business as usual scenario. The \$0.5 million in annual operating cost savings (uninflated) would be available to support debt servicing costs, up to \$13.8 million of self-liquidating debt based on 30 year debt at 2.75 percent. Utility customer rates would be based on the three buildings incurring the same annual costs for heating and electricity as under the BAU scenario, generating \$2.0 million of revenue (inflated 3.4 percent annually for the average escalation in natural gas, electricity and operating costs) to offset the operating and debt servicing costs over a 30 year period.

Under the current proposal of a heating only system for phase 1, the annual fuel and other operating costs savings relative to business as usual are projected to be between \$0.1 million

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and \$0.2 million per year, due mainly to lower natural gas consumption from a centralized district energy system. These annual operating savings are significantly less than the \$0.5 million previously projected under the CHP and Boilers system that would have been available to contribute towards the capital cost of the system. Therefore, an additional upfront contribution (investment) may be required by the City to further fund a portion of the capital cost of the Boilers Only system. Administration and EPCOR will return to City Council in the fourth quarter of 2022, prior to budget deliberations, with the updated capital and operating costs for the heating-only system, along with a strategy to address any potential funding gap.

As the district energy system continues to expand with additional buildings being connected in future years, economies of scale and other operating efficiencies will be realized. Under the agreement proposal, the City will benefit in part from these system-wide efficiencies resulting in a reduction in the annual fees paid to EPCOR to provide heating to the initial three buildings, recognizing the City's investment in excess system capacity.

### **Legal Implications**

Public utilities owned or operated by municipalities providing service within that municipality are generally exempt from Alberta Utilities Commission regulation pursuant to Section 78(2) of the *Public Utilities Act*. Public utilities that are not owned or operated by municipalities that supply water, heat, light or power are regulated by the Alberta Utilities Commission.

The generation, sale and distribution of electrical energy in Alberta is governed by the *Electric Utilities Act*, the *Hydro and Electric Energy Act* and their regulations. The change in project scope removing the electricity generation and supply removes the requirement for the City to make applications to the Alberta Utilities Commission and the Market Surveillance Administrator for approval to construct, own and operate an electrical generating unit.

## **COMMUNITY INSIGHT**

Project updates have been provided and presented to the Energy Transition Climate Resilience Advisory Committee (ETCRAC). Administration has been in ongoing communications with Winspear about the integration of the Downtown District Energy Initiative into their completion project. As part of the future project development, EPCOR and Administration are planning public consultation activities in the surrounding community.

### **GBA+**

The Downtown District Energy Initiative supports City Council's 10-year Climate Resilience objectives, the City Plan, and was identified as a "big win" in Edmonton's Community Energy Transition Strategy. The initiative is not directly public facing, and while there would be no changes in economical impact as a result of the project, the reduction of greenhouse gas emissions and the gain in energy resilience will be net positive impacts on a community level. In addition the direct liability towards Edmontonians is limited. The project does not foresee any medium or long term impact to residents or visitors in the downtown area as a result of construction activities.

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## RISK ASSESSMENT

Risk Element	Risk Description	Likelihood	Impact	Risk Score (with current mitigations)	Current Mitigations	Potential Future Mitigations
<b>If recommendation is not approved</b>						
Financial	Annual capital or operating costs for the district energy system are higher than projected, resulting in an increase in funding.	4 - Likely	4 - Severe	16 - high	Progression to Checkpoint 4 outside the existing budget. Review of external factors (see report) and change in project scope.	
Environmental	Greenhouse gas impact, CHP becomes carbon intensive shortly after start of operation	4 - Likely	4 - Severe	16 - high	Review of external factors (see report) and change in project scope.	