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The Regional Municipality of Durham Report

To: Committee of the Whole
From: Chief Administrative Officer
Report: #2024-COW-1
Date: January 17, 2024

Subject:

Courtice Transit-Oriented Community District Energy System Preliminary Business Case Update

Recommendation:

That the Committee of the Whole recommends to Regional Council:

- A) That Regional Council endorse in principle the concept of a district energy system (DES) in the Courtice Transit-Oriented Community (CTOC) that leverages waste heat from Regional infrastructure in the adjacent Clarington Energy Park, as outlined in this report and attachment.
- B) That Regional Council direct staff to work with staff from the Municipality of Clarington to incorporate the DES concept into the CTOC Secondary Plan to support the future implementation of a DES focused on serving new development in the CTOC Major Transit Station Area (MTSA).
- C) That Regional Council direct staff to evaluate potential grant and low-interest financing options that might be available to support the proposed CTOC DES project concept.
- D) That Regional Council direct staff to evaluate ownership and governance models for the CTOC DES in collaboration with the Municipality of Clarington, landowners in the area, as well as potential energy utility partners, and report back to Council in mid-2024 with a recommendation as well as an updated and refined preliminary business case, identifying Regional financial, business planning and budget implications, opportunity costs and assessment of risk and potential mitigation strategies based on refined project timing and implementation strategies.

Report:**1. Purpose**

- 1.1 This report seeks Council endorsement in principle of the CTOC DES concept and the recommended next steps which intend to further evaluate ownership models, update the preliminary business case, financing options and energy sources related to a proposed DES in Courtice.

2. Background

- 2.1 Regional staff have been actively pursuing opportunities to achieve Regional Council's vision for a low carbon future as reflected in the [Durham Region Strategic Plan](#), the Council-endorsed Durham Community Energy Plan (DCEP) and the Region's [climate emergency declaration](#). The building sector in Durham Region is a key area for action, accounting for approximately 30 per cent of community wide GHG emissions, largely generated from energy consumption for space and domestic hot water heating and cooling.
- 2.2 The DCEP identified district energy as a strategic priority for building sector decarbonization with the potential to contribute more than 15 per cent of total GHG emissions reductions by 2050, making it one of the top decarbonization strategies for Durham Region. District energy feasibility is highly correlated with density of land use (i.e., greater density of population and jobs tends to improve the technical and financial viability). As such, there is an opportunity to implement district energy in the context of the Region's designated Protected Major Transit Station Areas (PMTSAs) and Strategic Growth Areas to help achieve Durham Region's climate objectives. A brief introduction to district energy, its advantages including improved overall energy security, provision of affordable low carbon heat, and reduction of community GHG emissions, as well as associated challenges can be found in report [#2022-INFO-55](#).
- 2.3 [Durham's Regional Official Plan](#) (Envision Durham), as adopted by Regional Council on May 17, 2023, underscores the importance of supporting the development of low carbon energy systems. The plan encourages the development of district energy to provide low carbon energy to higher-density Community Areas, with a focus on connectivity to existing or planned networks.
- 2.4 Through adoption of recommendations in report [#2022-P-11](#) associated with Envision Durham's Growth Management Study Regional Council provided direction that:
- “...future Regional Official Plan policies for the required settlement area boundary expansion area address sustainability practices to reduce greenhouse gas emissions, energy and water consumption, and waste generation through measures including...the use of low-carbon and

smart energy systems and technologies at the district scale or building-scale in these new areas”.

- 2.5 [Durham Region’s Economic Development and Tourism Strategy and Action Plan](#) identifies “future energy” as a key priority economic cluster, and points specifically to the Clarington Energy Park as an area where the Region will collaborate with key partners to attract energy investment.
- 2.6 Through the negotiations associated with the development of the Durham York Energy Centre (DYEC), Durham Region and the Municipality of Clarington signed a [Host Community Agreement](#) in 2010 which included agreement by Clarington to “strongly encourage and promote development within the Clarington Energy Business Park and other areas of Clarington to utilize district heating and cooling provided by the energy from waste (EFW) Facility”.
- 2.7 A 2022 [pre-feasibility study co-led with Clarington](#) and the Region developed a preliminary assessment of the feasibility of a first phase of a DES focused on the Clarington Energy Park and Courtice Employment Lands and Major Transit Station Area (MTSA) surrounding the planned new Courtice GO Station. The pre-feasibility study found that conditions in South Courtice were potentially favourable for the implementation of a DES. Sources of low carbon heat are in proximity to planned higher density transit-oriented mixed-use development within the Courtice MTSA, including the DYEC and the Courtice Water Pollution Control Plant (WPCP).

3. Courtice Transit Oriented Community District Energy Preliminary Business Case

- 3.1 Following the 2022 pre-feasibility study exploring DES potential across the southern Courtice, Regional staff collaborated with the Municipality of Clarington and a consulting team consisting of Reshape Strategies and Kerr Wood Leidal (together, the Project Team) to develop a more detailed business case focused on serving the Courtice Major Transit Station Area (MTSA) with waste heat from Regional infrastructure in the Energy Park immediately to the south of Highway 401. This area was chosen because of the planned higher densities of population and employment surrounding the future Courtice GO Station at the intersection of Courtice and Baseline Roads. The full preliminary business case analysis is available as Attachment #1 to this report, and key findings are summarized in this report.
- 3.2 Key activities used to develop the preliminary business case included:
 - a. **Cross-Departmental and Inter-Municipal Engagement:** the preliminary business case analysis was undertaken in collaboration with internal staff across departments (Finance, Works, Planning, and CAO’s Office), as well as staff from the Municipality of Clarington to gather input, highlight key considerations, and identify challenges and opportunities associated with

- different DES scenarios, including using waste heat from the DYEC facility and the Courtice WPCP, as well as exploring potential cooling applications.
- b. **Develop Phase 1 concept for a DES focused in the Courtice MTSA.** The project team developed an updated DES concept which incorporates load forecast analysis based on population and job inputs from the secondary planning process, preliminary indicative capital cost estimates (i.e., Class D estimate, including allowances and contingencies), and a site map which defines the DES service area, projected gross floor areas served, and the proposed distribution network plan.
 - c. **Courtice DES Preliminary Business Case Analysis of Scenarios:** the preliminary business case analysis involved an assessment of costs, the potential GHG emission reductions, and additional benefits associated with four DES technical concepts:
 - 1) DYEC heating and cooling;
 - 2) Courtice WPCP heating and cooling;
 - 3) Courtice WPCP heating only (cooling supplied through in-building systems);
 - 4) DYEC heating only (cooling supplied through in-building systems).
- 3.3 These concepts were evaluated against a reference case whereby buildings in the Courtice MTSA achieve low carbon outcomes through fully electrified on-site heating systems, as well as a business-as-usual (BAU) case whereby each building has on-site natural gas boiler heating with conventional chillers and cooling towers. All scenarios assume evolution in the requirements for building energy and emissions performance over the 30-year forecast period, whether driven by a local municipal green development standard (such as is currently in place in Pickering, Ajax, and Whitby) or through changes to the Ontario Building Code.
- 3.4 While the BAU case was found to result in the lowest cost of energy to the end-user, it results in GHG emissions that are approximately 75 per cent higher than the DES concepts and the electrification reference case which is inconsistent with Council direction as outlined in Section 2 of this report. The technical and financial analysis of the four DES technical concepts listed above in Section 3.2c identified a heating-only system that leverages DYEC heat as the preferred concept and the basis for subsequent base case analysis because it:
- a. Is the lowest cost pathway to achieving the Region's low carbon development objectives when compared to other low carbon DES concepts as well as a reference case where all buildings in the area have 100 per cent electrified heating. The overall capital costs for the DES are estimated at \$62 million in 2023 dollars (\$116 million cumulative nominal costs over 30-year project lifecycle). The cost estimates, allocation of project costs and respective responsibilities of involved parties will be determined in the next phase of the preliminary business case. These expenses are assumed to be incurred over the 30-year build out period, with potential subsidies from

- grant funding and low-cost debt financing programs specifically designed to support DES possibly being available to enhance the viability of the project concept.
- b. Results in the lowest cost per tonne of GHG emissions reductions (\$/tCO_{2e}) when compared to the electrification scenario as well as the three other DES concept scenarios.
 - c. Offers potential for greater energy cost stability to energy consumers in the CTOC compared to building-scale energy systems, namely due to reduced exposure to escalating electricity and/or natural gas rates and carbon pricing over the 30-year forecast period.
- 3.5 The foregoing analysis indicates the potential for the CTOC DES to support alignment of GHG emissions reduction objectives with energy security objectives within the Courtice MTSA. This is a unique opportunity for the Region and Clarington to work with utilities and landowners to demonstrate leadership in the low carbon transition in the context of a major transit-oriented development initiative surrounding the future Courtice GO Station.
- 3.6 The project team conducted a sensitivity analysis on the CTOC DES preliminary business case to a range of key input parameters to understand the relative impact of these variables on the DES preliminary business case. Key findings of the sensitivity analysis include:
- a. **Higher than projected capital costs represent the most significant risk to the preliminary DES business case.** Capital costs in the preliminary business case are preliminary estimates (including contingencies and allowances), which is appropriate at a conceptual design stage. The project team has included a 40 per cent contingency in the cost estimates to account for uncertainty at this conceptual stage, and cost estimates will be refined in 2024 as more clarity emerges on the development phasing plans of landowners, the road network in the MTSA, and the associated costs of the DES distribution piping system.
 - b. **Uncertainty in future load is another key risk factor** identified in the sensitivity analysis, which is influenced by factors such as the phasing of new construction and the density of population and jobs that is ultimately realized in the MTSA. The project team has made conservative estimates, including use of the minimum target for population and jobs identified for the MTSA in the draft CTOC Secondary Plan. Note that the load forecast is based on a higher level of building energy efficiency than what is presently mandated by the Ontario Building Code. Should the higher target density scenario outlined in the draft CTOC Secondary Plan be achieved, the DES preliminary business case would be enhanced by an additional \$25 million (net present value) over the forecast period under the base scenario. Consultations with the Municipality of Clarington and the landowner group in 2024 will help to refine these input parameters for the next phase of the business case.

- c. **Availability of grant funding and low-cost financing** could materially enhance the options to finance a proposed Courtice DES project concept. There are a number of funding programs available to support DES development, including the FCM Green Municipal Fund, Environment and Climate Change Canada's Low Carbon Economy Challenge Fund, as well as Canada Infrastructure Bank's Clean Power funding stream.

4. **Next Steps to Refine Courtice DES Preliminary Business Case & Implementation Strategy**

4.1 In further developing the CTOC DES preliminary business case and implementation strategy, evaluation and determination of a preferred ownership and governance model will be a key area of focus. There are several different ownership models for DES, which can range from wholly municipally owned, public-private partnerships, and wholly privately owned options. There are tradeoffs between each model and the ownership type selected is often dependent on the specific context of municipalities and factors such as regulatory authority, risk tolerance, desired degree of control, and external market conditions. A high-level summary of governance model options is provided below:

- a. **Publicly-owned:** in this case municipalities retain full ownership and control of the DES, either wholly or in collaboration with other local governments. This ownership model would make it easier to establish connection requirements and/or provide connection incentives to reduce load risk. Municipally-owned systems have more control over the carbon intensity of the DES over time. Municipalities may also have access to lower cost of capital and grants from senior levels of government, as well as a longer time horizon for return on investment than private utilities. Examples of publicly owned DE systems include Vancouver's False Creek Neighbourhood Energy Utility and Markham's DES.
- b. **Public-Private partnership:** municipal ownership does not necessarily mean that all DES assets are financed, owned, and operated by the municipality. In some cases, municipal ownership can be viewed as a transitional strategy to initiate a new DES, which can then be divested to the private sector once adequately established. In some cases, the municipality will enter a partnership with a private sector entity to establish a new system which offers the benefit of risk sharing the initial investment. These can also include private or public utilities as a joint venture. An example of this model is the City of Ottawa's Zibi community utility DES, which is co-owned in partnership between Ottawa Hydro and the developer, Dream.
- c. **Privately-owned:** in this scenario, the DES is wholly owned by the private sector. While privately owned systems present an alternative to municipal ownership, their feasibility depends on load certainty, energy, and GHG performance requirements in municipal green development standard programs. An example of this type of model is the DES that serves the master planned development, River District (Vancouver, BC). The resulting

DE Utility, River District Energy (RDE) is a private utility, owned by the master developer, Wesgroup.

- 4.2 As part of the recommendations associated with this report, Regional staff are seeking direction to further evaluate DES ownership and governance models and report back to Council on findings and proposed next steps. This evaluation will also consider impacts on the updated preliminary business case which will be presented concurrently with recommendations on DES ownership and governance models. Pending Council approval, this comprehensive assessment of options will be a key component in the next phase of the proposed project concept where stakeholder engagement will be carried out concurrently to gather feedback.
- 4.3 Integral to the effort to develop an updated business case for the DES will be further evaluation of the economic and environmental rationale for connecting the Courtice WPCP. The business case presented in this report assumes that biogas that is currently produced and consumed on-site at the Courtice WPCP will in the future be upgraded to renewable natural gas (RNG) and exported from the site to support GHG emissions reductions elsewhere. Dialogue with [Enbridge](#), and other utilities seeking RNG opportunities, will be critical to this evaluation.
- 4.4 The project team envisions the following tentative project development timeline to phase DES delivery to mitigate investment risk:
 - a. **2024-2026**: inclusion of DE in the Courtice MTSA secondary plan, evaluation and selection of a preferred ownership model, and negotiation of agreements for Phase 1 project delivery.
 - b. **2027-2033**: Phase 1 of the DES will be served by a temporary natural gas boiler plant (or plant integrated with a municipal facility). Once sufficient load is connected to the DES, the connection to DYEC would be completed, decarbonizing the heat supply to all buildings connected to the DES. This phase would involve the design and construction of DYEC heat recovery system and transmission piping, as well as negotiation of Phase 2 agreements with landowners. This phase would also involve negotiation/renegotiation of agreements associated with the DYEC to enable heat recovery from the facility (i.e., with co-owner York Region, as well as the facility operator).
 - c. **2034-2050**: at least 90% of annual heating in buildings connected to the CTOC DES is supplied by heat from DYEC.
 - d. **2050+**: depending on growth outside the MTSA, the DES may be expanded to serve additional areas and additional low-carbon heat supplies may be connected as required.
- 4.5 Regional staff are seeking direction to explore potential funding and low interest debt financing avenues, such as the Federation of Canadian Municipalities' (FCM) Green Municipal Fund (GMF) program and the Canada Infrastructure

Bank (CIB). In the last two years, CIB has provided over \$1 billion dollars in debt financing to three DES utilities. It is anticipated that available grant funding and low interest debt financing could cover a portion of the project's capital costs, potentially strengthening the financial viability of the proposed Courtice DES project concept, as currently contemplated.

- 4.6 Although the Courtice DES project focuses on the feasibility of utilizing waste heat from the Region's solid and liquid waste management facilities, there may be additional energy sources and thermal waste heat that can be considered for long-term expansion, as well as parallel initiatives that complement the project. These are outlined below:
- a. The Region's pursuit of Project Woodward, being the creation of a clean energy business and industrial park, in the Clarington Energy Park offers potential alignment and thermal load support for the Courtice DES.
 - b. The recent provincial [announcement to build small modular reactors \(SMRs\)](#) also may present an opportunity to leverage nuclear waste heat in terms of future district energy system expansions/ nodes.
 - c. There may also be opportunity to leverage industrial waste heat sources located in proximity to the Courtice area, such as St. Mary's Cement plant.

5. Key Recommendations and Next Steps

- 5.1 Based on the Courtice DES preliminary business case findings, the following recommendations are outlined to support the next steps identified in section 4:
- a. Regional Council endorsement in principle of the Courtice DES project and the recommendations of this report.
 - b. Undertake an evaluation of a preferred service delivery model for the Courtice DES, exploring costs, risk mitigation and other potential Regional implications for options ranging from municipal ownership, hybrid (public-private), to fully private ownership and recommend a preferred model for service delivery.
 - c. Collaborate with Clarington to integrate the DES concept into the CTOC Secondary Plan, including definition of a DES service area focused on the MTSA.
 - d. Engage with the CTOC landowner group and local energy utilities to seek support for the successful implementation of the DES and foster collaboration and alignment with project goals, and where applicable, gather preliminary capital and operational cost estimates and related implementation timelines and information for utility site servicing connections and related approvals.
 - e. Engage with funding / financing agencies to pursue potential financing sources such as FCM/GMF and CIB, as well as explore additional financial tools and options to help capitalize the DES project.

- 5.2 Staff in the CAO's Office, Finance, Works, and the Planning and Economic Development departments have reviewed the content of this report and will collaborate in implementing the recommendations of the report.
- 5.3 For additional information, contact: Ian McVey, Manager of Sustainability, at 905-668-7711, extension 3803.

6. Relationship to Strategic Plan:

This report aligns with the following strategic goals and priorities in the Durham Region Strategic Plan:

- a. Goal #1 – Environmental Sustainability
- Goal 1.1 - Accelerate the adoption of green technologies and clean energy solutions through strategic partnerships and investment; and
 - Goal 1.4 - Demonstrate leadership in sustainability and addressing climate change.
- b. Goal #3 – Economic Prosperity
- Goal 3.4 – Capitalize on Durham's strengths in key economic sectors to attract high-quality jobs.

7. Attachments

Attachment #1: Courtice District Energy System Preliminary Business Case Report

Respectfully submitted,

Original signed by

Sandra Austin
Executive Director, Strategic Initiatives

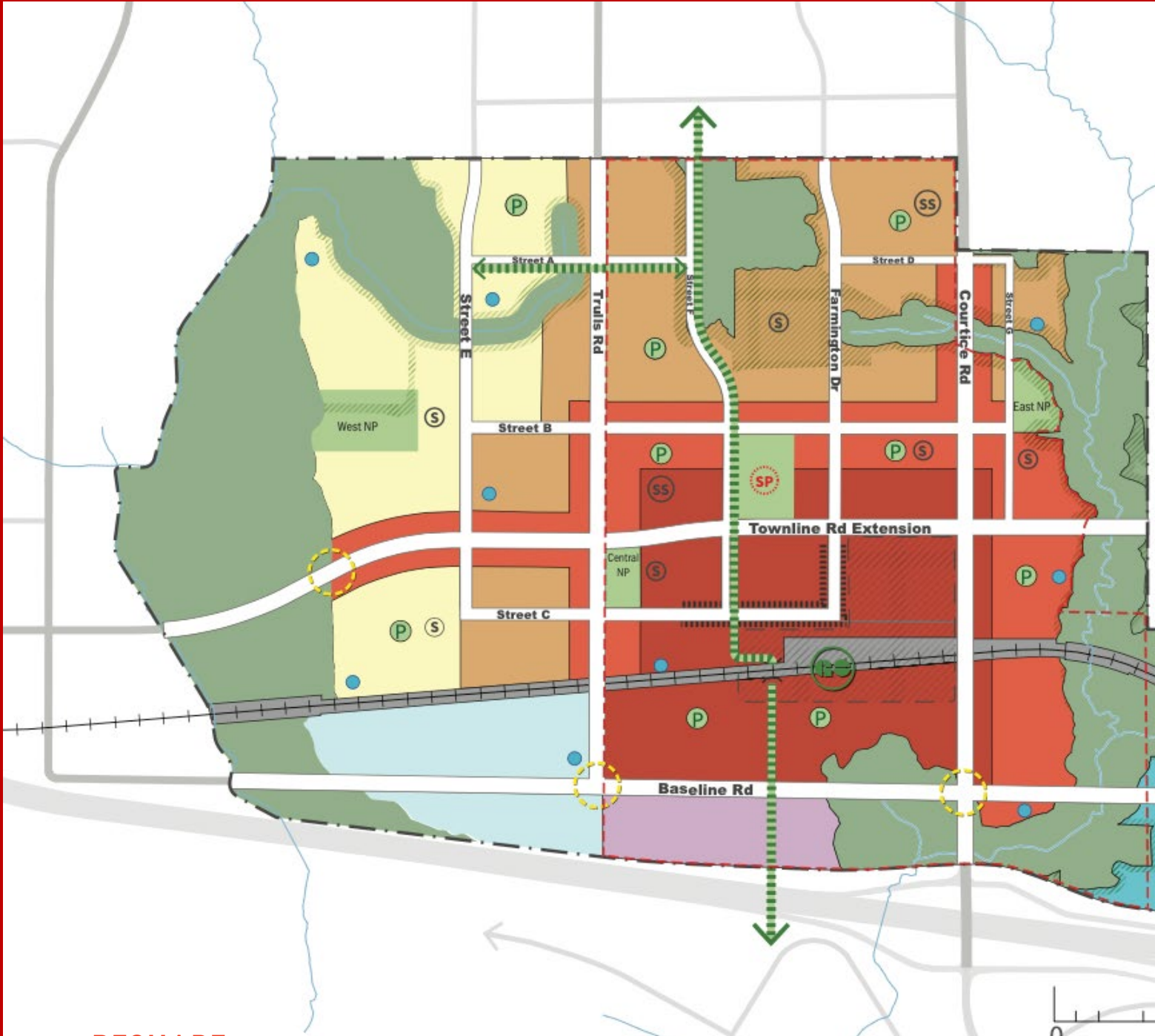
Original signed by

Elaine C. Baxter-Trahair
Chief Administrative Officer

Courtice Transit Oriented Community District Energy Preliminary Business Case

Prepared for The Region of Durham

January 3, 2024



**RESHAPE
STRATEGIES**



Statement of Limitations

This report has been prepared by Reshape Infrastructure Strategies (“Reshape”) for The Regional Municipality of Durham (the Region), and for the exclusive use and benefit of the Region (“Client”). This report represents the best professional judgment of Reshape, based on the information available at the time of its completion and as appropriate for the scope of work. Services were performed according to normal professional standards in a similar context and for a similar scope of work.



Executive Summary

The Regional Municipality of Durham (the Region) engaged Reshape Infrastructure Strategies, Kerr Wood Leidal, and RR Consulting to evaluate the business case for a District Energy System (DES) serving the new, high-density Major Transit Station Area (MTSA) that is expected to develop around the planned Courtice GO station in the Municipality of Clarington. The high-density development is referred to as the Courtice Transit Oriented Community (CTOC).

The CTOC preliminary district energy business case evaluation was completed in two phases. The first phase was a screening-level analysis of four different district energy concepts. The concepts were evaluated on a lifecycle basis to identify the preferred energy source (either the Durham York Energy Centre or the Courtice Water Pollution Control Plant) and system configuration (heating and cooling versus heating only).

The screening analysis found that a heating only system with heat from the Durham York Energy Centre has the lowest capital and lifecycle cost, as well as the lowest levelized cost of avoided GHG emissions. This concept – heating-only service from Durham York Energy Centre – was carried forward to the second phase, development of a DES Utility cost recovery model based on utility rates and fees.

CTOC District Energy System Utility Cost Recovery Model

Prior to developing a District Energy (DE) Utility cost recovery model, the DES concept was refined to include a temporary energy centre (a containerized gas boiler plant) located in Courtice that will provide heating to the first buildings that develop in the CTOC. The temporary energy centre will reduce investment risk by deferring the capital cost of connecting to the Durham York Energy Centre until sufficient load has developed in the CTOC, while also ensuring that the DES is ready to provide service when the first buildings in the neighbourhood require it.

The DE Utility rates and fees in this report are based on a revenue-neutral utility as shown in Figure E1 (total revenues equal to lifecycle costs). The DE Utility rates and fees required for full cost recovery indicated that the low carbon CTOC DES could provide the following benefits to the Region of Durham, Municipality of Clarington, CTOC Landowners, and CTOC residents:

- Alignment with the Durham Community Energy Plan’s objectives to reduce GHG emissions and facilitate the transition to a clean energy economy. Buildings connected to the CTOC DES will have a clear decarbonization pathway, avoiding carbon lock-in of buildings. The CTOC DES is estimated to result in 130,000 tonnes of cumulative avoided GHG emissions in the first 30 years of the project as compared to the Business-as-Usual Reference Case (see Figure E2) of heating with natural gas.
- The preferred low-carbon DES is the lowest-cost pathway to decarbonizing building heating in the CTOC.
 - The DES business case indicates that the low-carbon DES will result in lower thermal energy costs for rate payers than electrification of heating at the building level (via air source heat pumps and electric boilers in the 100% Electrified Reference Case – see **Error! Reference source not found.**).

- District energy will allow CTOC building owners to be less exposed to escalating electricity costs than if CTOC buildings are built with 100% Electrified heating systems (Figure E3).
- From a landowner (developer) perspective, connecting to a low carbon DES is a lower-cost pathway than constructing on-site low-carbon heating systems (see Figure E4).
- Increased building design flexibility relative to on-site low-carbon heating systems and reduced noise impacts.
- Reduced strain on the electrical distribution system relative to building-scale electric heating systems.

Although the DE Utility business case base scenario is presented as “revenue neutral” in this report, there are several opportunities that could result in a positive net present value for the DE Utility over the 30-year project lifecycle, including:

- Increasing DE utility rates to capture some of the rate payer energy cost savings relative to the alternative decarbonization pathway of 100% electrified heating as revenue for the utility.
- Access to low-cost debt financing through the Canada Infrastructure Bank (which has signed financing agreements with multiple public and privately owned DE utilities).
- Access to grant funding through organizations and funding streams such as the Federation of Canadian Municipalities’ Green Municipal Fund and the Low Carbon Economy Fund.

CTOC District Energy System Project Risks

There are several key risks that would adversely impact the business case for the CTOC district energy system by significantly increasing the cost of DES service (resulting in higher DES rates or a revenue shortfall for the DE Utility). These risks include:

- Higher capital costs and higher cost escalation.
- Higher financing costs.
- Lower heating demands and slower build out than modeled.
- Excluding the Courtice Water Pollution Control Plant from the DES load forecast.

The DES business case sensitivity analysis is provided in Figure E5.

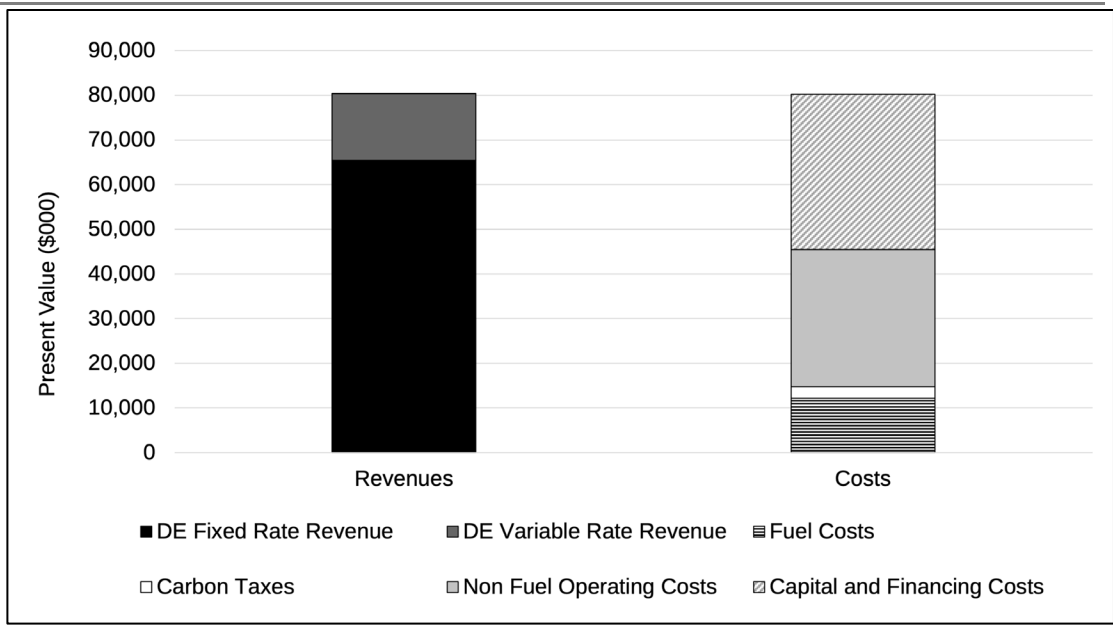


Figure E1: DE Utility Costs Equal to Utility Revenues on a Present Value Basis

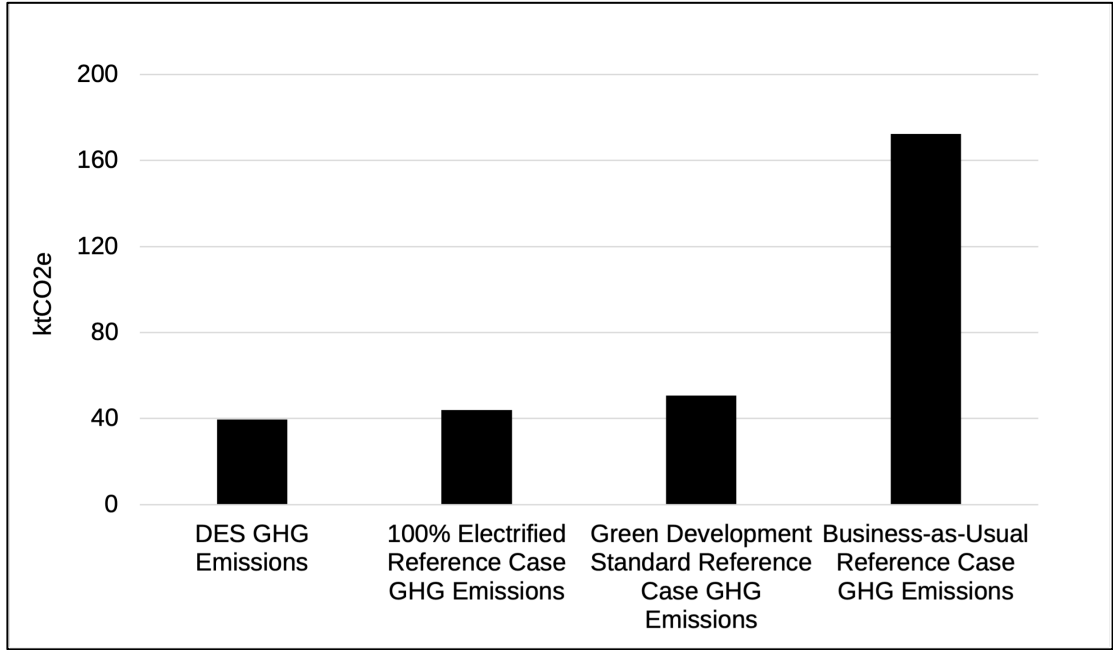


Figure E2: Cumulative GHG Emissions from the CTOC DES and Reference Cases

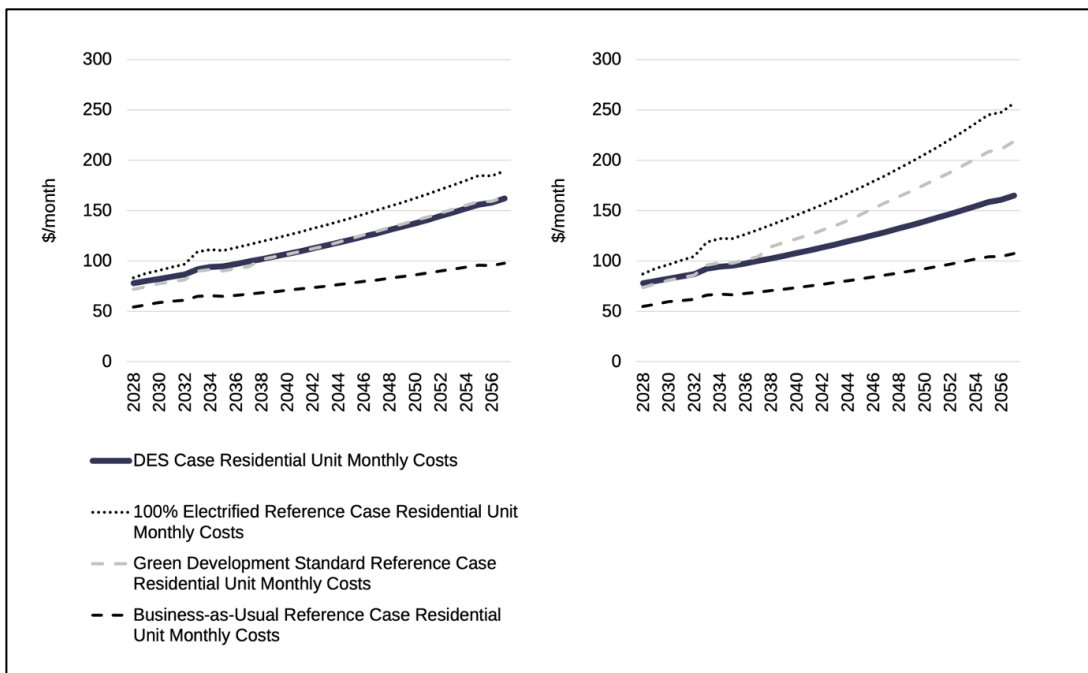


Figure E3: Representative Monthly Costs for Residential Unit with 2.6% annual electricity price escalation (left) and 4% annual electricity price escalation (right).

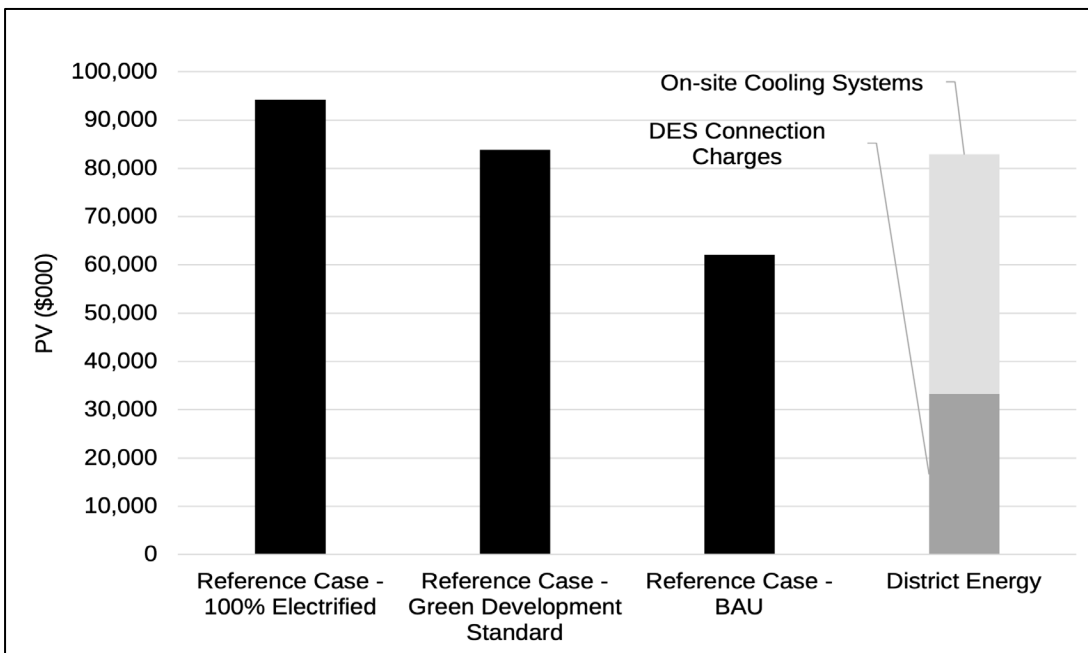


Figure E4: 30-Year Present Value of Landowner (Developer) Costs to Connect to District Energy compared to the 100% Electric and natural gas BAU reference cases.

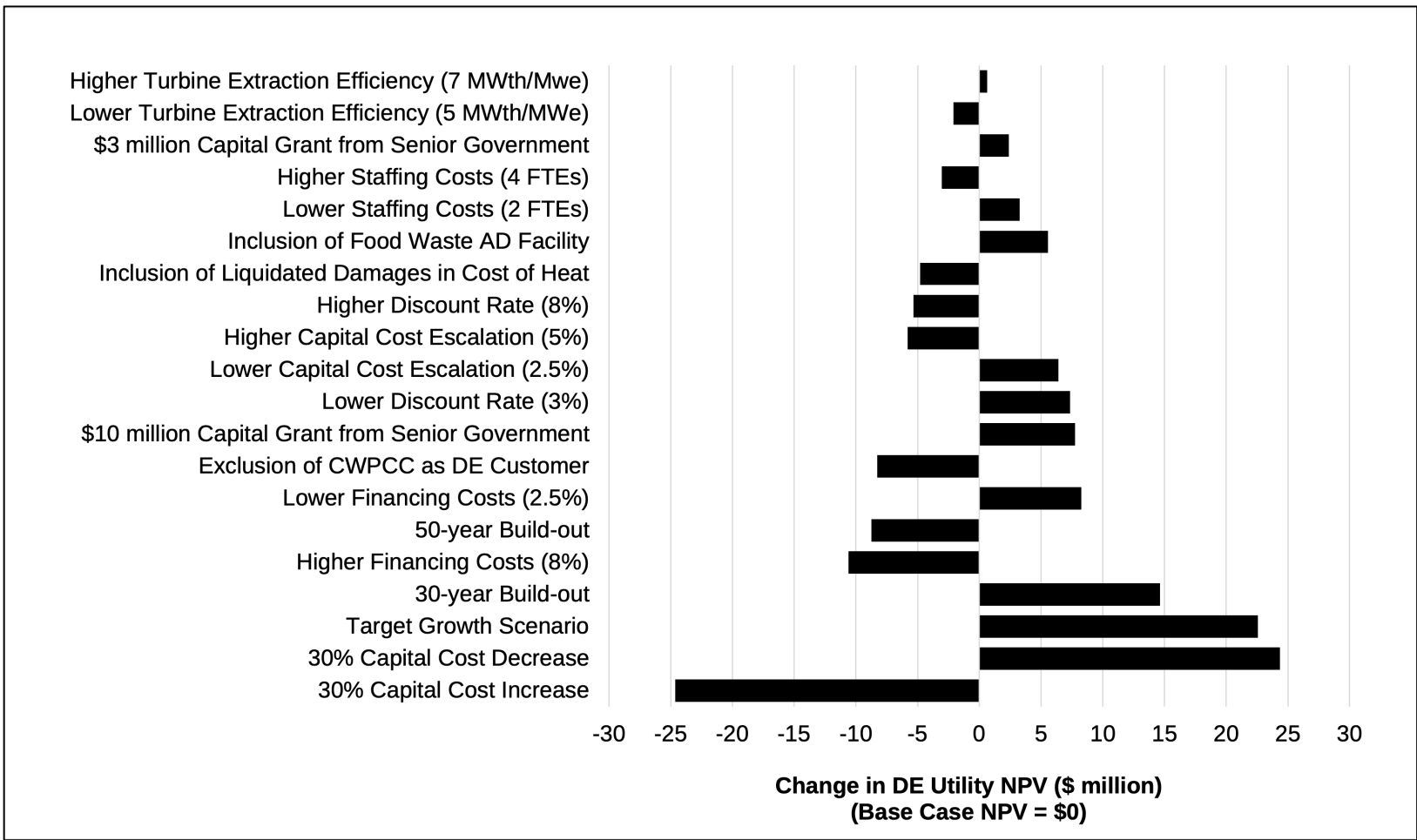


Figure E5: DES Business Case Sensitivity Analysis

Recommendations and Next Steps

Based on the benefits provided by district energy in the CTOC, Reshape recommends that the Region undertake the following next steps to advance the project:

Include District Energy in the CTOC Secondary Plan: Collaboration with the Municipality of Clarington to include DE supportive policies in the Secondary Plan will provide legitimacy for the system and provide clarity for landowners with respect to energy services in the neighbourhood. In addition, including DE in the CTOC Secondary Plan may also support funding applications and discussions with potential DE partners and sources of financing (such as the Canada Infrastructure Bank).

Identify a Preferred Ownership Model and Delivery Strategy: It is recommended that the Region conduct a structured evaluation of different CTOC DES ownership models to identify the one that best aligns with the Region's objectives. This analysis will include an examination of costs and benefits associated with transferring project risk through public private sector partnerships.

Engage with Landowners: It is recommended that the Region and the Municipality engage with landowners in the CTOC to ensure that they understand the benefits and impacts of the DES on their buildings and business models. Securing the support of landowners early in the project development process will support the objective of including DE in the CTOC Secondary Plan.

Engage with Local Utilities: District Energy in the CTOC will impact the infrastructure requirements of other local utilities in the area.

- Achieving low-carbon development in the CTOC without electrifying building heating will reduce the capacity requirements of local electrical distribution infrastructure in the CTOC. It is recommended that the Region engage with Hydro One to identify the magnitude of Hydro One infrastructure cost savings from developing the proposed DE concept. There may be an opportunity for the DES project to be recognized as a “non-wires alternative”, potentially enabling access to funding support through Hydro One, the Independent Electricity System Operator, or the Ontario Energy Board.
- The DES will greatly reduce or eliminate the need for gas distribution infrastructure throughout the CTOC, replacing it with a single large gas service connection to the Courtice District Energy Centre. If the DES proceeds, the Region should communicate with Enbridge to avoid stranded or underutilised gas distribution infrastructure in the CTOC.

Consideration of District Cooling: The analysis completed as part of this study showed that on a lifecycle cost basis, in-building cooling systems are lower cost than district cooling in the CTOC. However, some landowners may see additional value in eliminating cooling equipment from their buildings, freeing up valuable building rooftop space and reducing noise and vibration issues. If landowners in the CTOC are strongly in favour of district cooling and express a willingness to pay a premium to eliminate cooling equipment in their buildings, the Region could consider developing a district cooling

business case in partnership with the CTOC landowners, or potentially facilitating a procurement process for a private sector utility to deliver district cooling in the CTOC with landowner group participation. District cooling would also benefit Hydro One, as it would further reduce the electrical distribution system loads, as noted above.

Integration of DE Modifications with Other Projects at DYEC: there is significant potential for interaction with overall DYEC performance related to the design and operation of the DES, including opportunities to enhance plant performance relative to existing conditions.

Given the complexities of DYEC ownership and operational agreements and environmental permits, agreements with the facility owners and operator will be required to further the development of design components as well as incorporate any operations and maintenance activities. Opportunities for efficiencies to both parties, such as the addition of DE steam extraction from the low-pressure port (rather than the high-pressure port, as specified in the original facility agreement) may be explored as part of the negotiations.

RR Consulting recommended that after implementation of the new systems, the actual performance should be verified by a third party and mutually agreed by both parties to ensure adequate and continued system performance.

As noted above, these terms can only be finalized once the system requirements and equipment design of the DE system is known, however a Memorandum of Understanding on the process and principles for developing the agreement could be agreed to in advance with relevant stakeholders.

Evaluation of the CWPCP RNG Upgrader Business Case: Since the CWPCP is currently heated with low-carbon biogas produced on-site, the driver for connecting the CWPCP to the Courtice DES is the potential to free up the biogas for RNG upgrading (rather than GHG emissions reductions). To confirm whether the CWPCP should connect to the DES, the business case for an RNG upgrading system at CWPCP should be evaluated.

Refinements to DES Concept and Business Case: As further details of the land use in the CTOC are available, the DE distribution piping system concept should be refined and optimized based on a proposed site for the Courtice Permanent (and Temporary) Energy Centre. This step could include developing a defined “Phase 1” DE service area, based on near-term development proposals.

In addition, the sizing of the transmission pipe from DYEC to Courtice should be reviewed and optimized. Currently the piping is sized to transmit 15 MW of heat from DYEC, which is more than necessary to serve the Courtice DES base load, however this should be weighed against the future option value of increasing the low-carbon heat supply from DYEC.

Lastly, the Region may want to consider co-locating the DES distribution piping with the pedestrian / cyclist infrastructure that would connect the CTOC to the lakeshore as a means of reducing the costs of crossing the 401 and streamlining the approvals process.