



Blatchford

Implementing the Vision: District Energy





Vision

Blatchford will be home to 30,000 Edmontonians living, working and learning in a sustainable community that uses 100% renewable energy, is carbon neutral, significantly reduces its ecological footprint, and empowers residents to pursue a range of sustainable lifestyle choices.

Blatchford Energy Strategy

Conservation

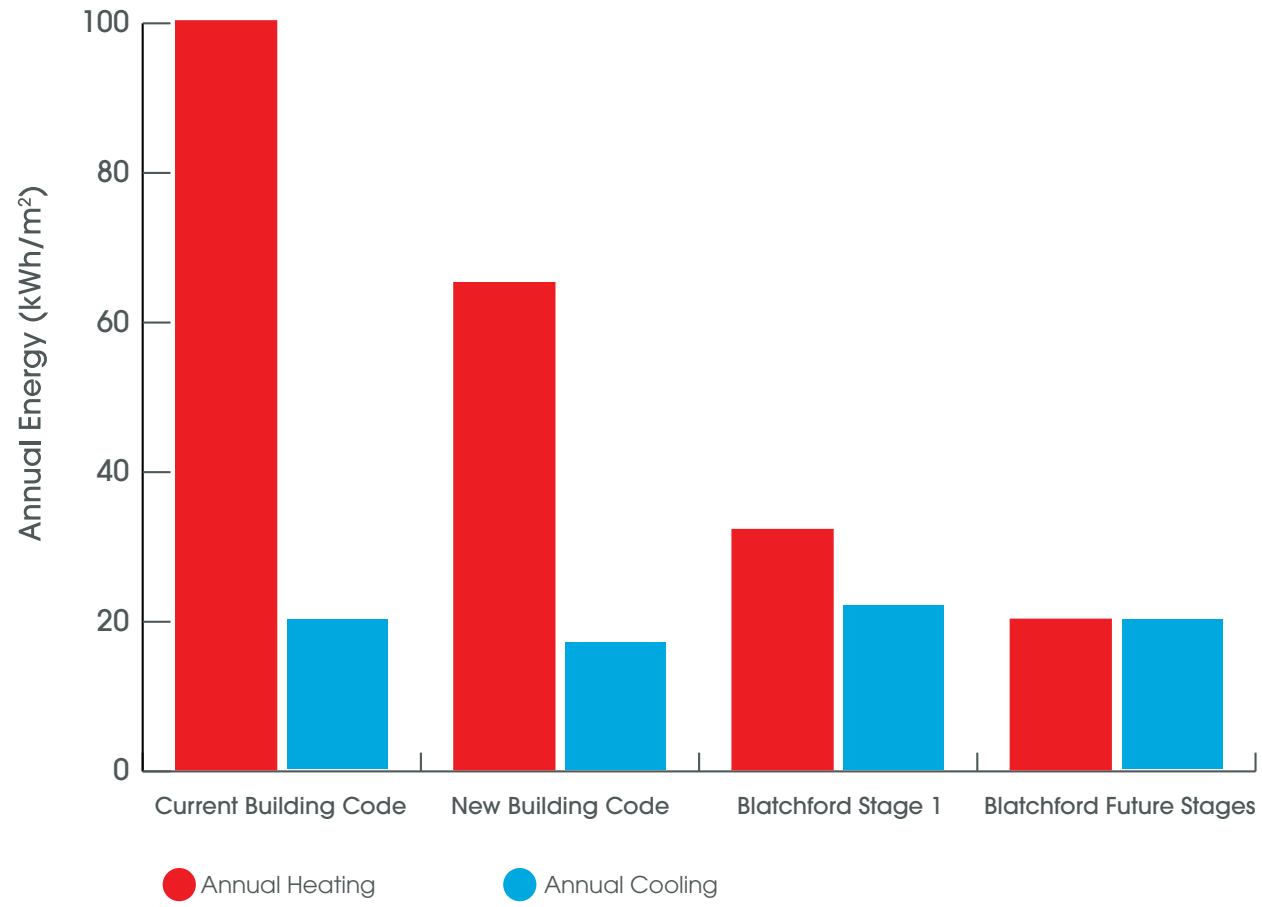
High Performance Buildings

Efficiency

District Energy Sharing System

Renewables

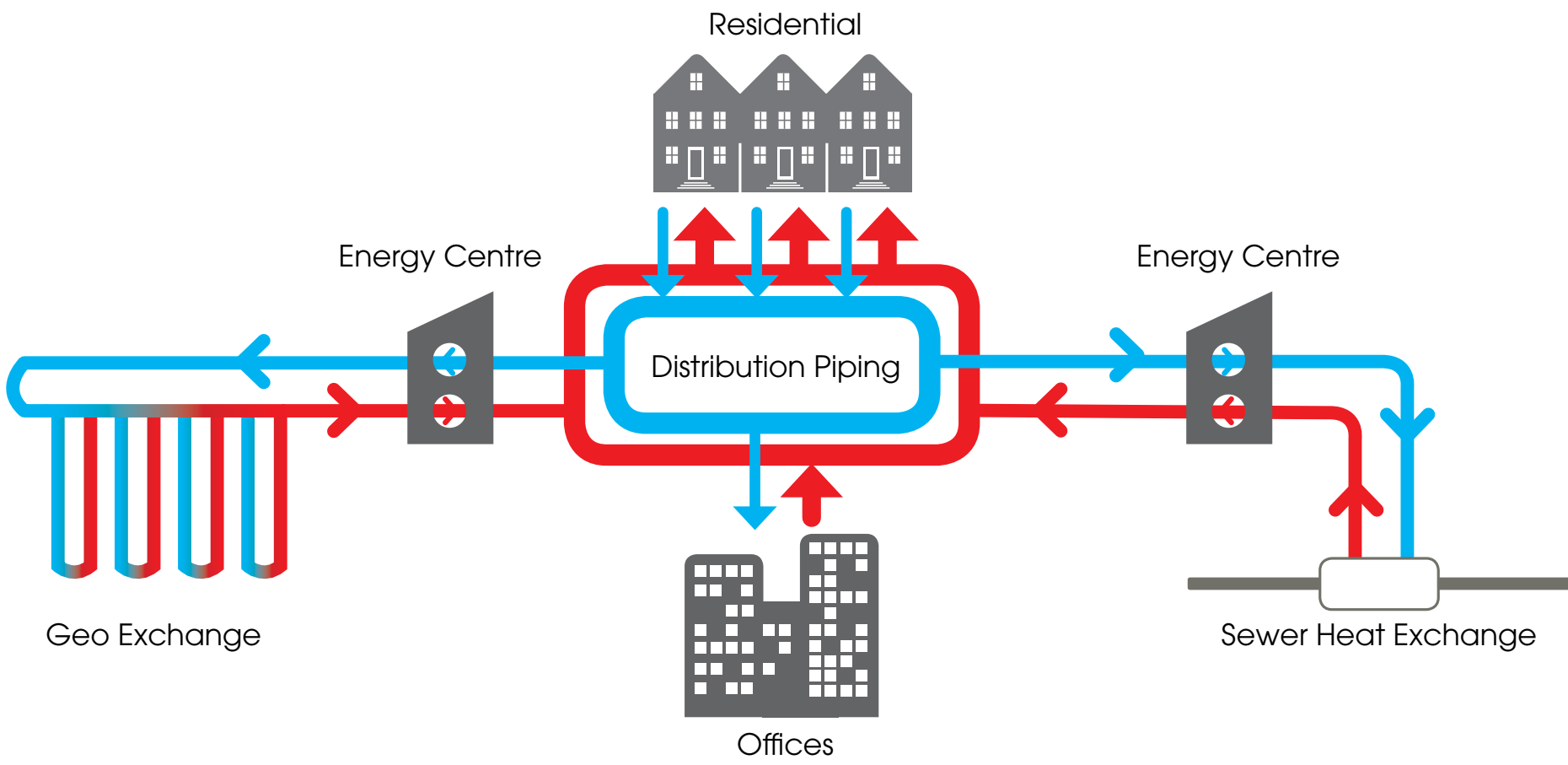
Geo-exchange
Sewer Heat Exchange
Solar PV



Energy Conservation – High Performance Building Envelopes

Blatchford's energy conservation strategy will mandate high performance buildings, which exceed the energy performance requirements of the Alberta Building Code. More aggressive targets will be applied in subsequent phases of development.

High performance buildings will reduce the energy demand on site and help balance the heating and cooling required.



Energy Efficiency – District Energy Sharing System

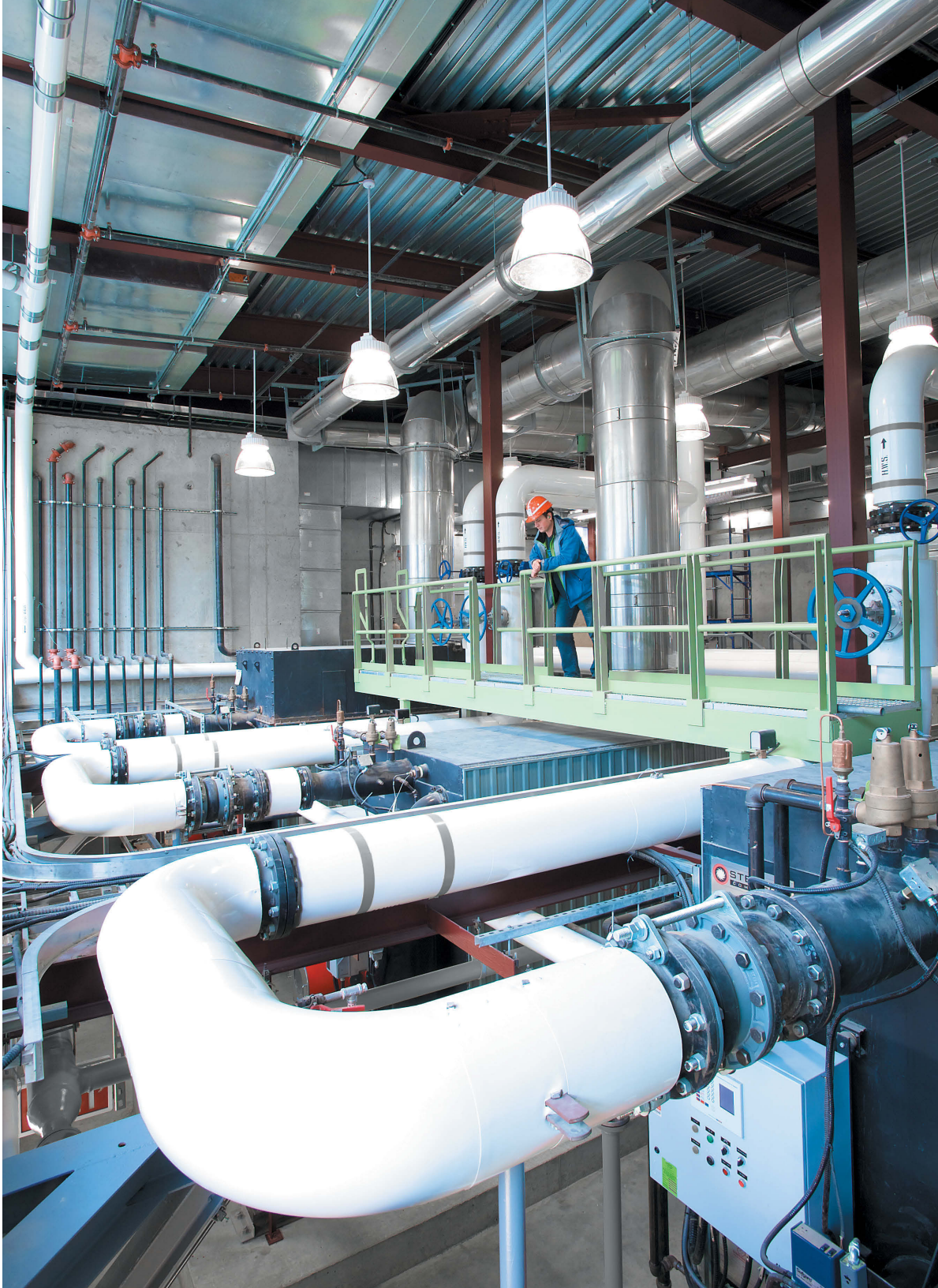
Blatchford will deliver energy efficiently with a district energy sharing system (DESS).

A DESS is similar to a traditional district energy system in that energy from a centralized source is distributed to multiple buildings. While traditional systems deliver high temperature water that can be used directly for heating buildings, a DESS distributes ambient (room temperature) water. The ambient heat is then upgraded by heat pumps, which provide both heating and cooling.

One of the main advantages of a DESS is that it allows for greater flexibility to directly tie-in renewable energy sources. Many renewables, such as geo-exchange and sewer heat recovery, provide low-temperature energy which can be used directly by the DESS.

Implementing a DESS will also allow Blatchford to share energy between buildings. In a neighbourhood the size of Blatchford with a large diversity of building types and occupancies, energy sharing can reduce overall energy consumption by 15 to 20 per cent. The more energy sharing that occurs, the less external energy is needed.





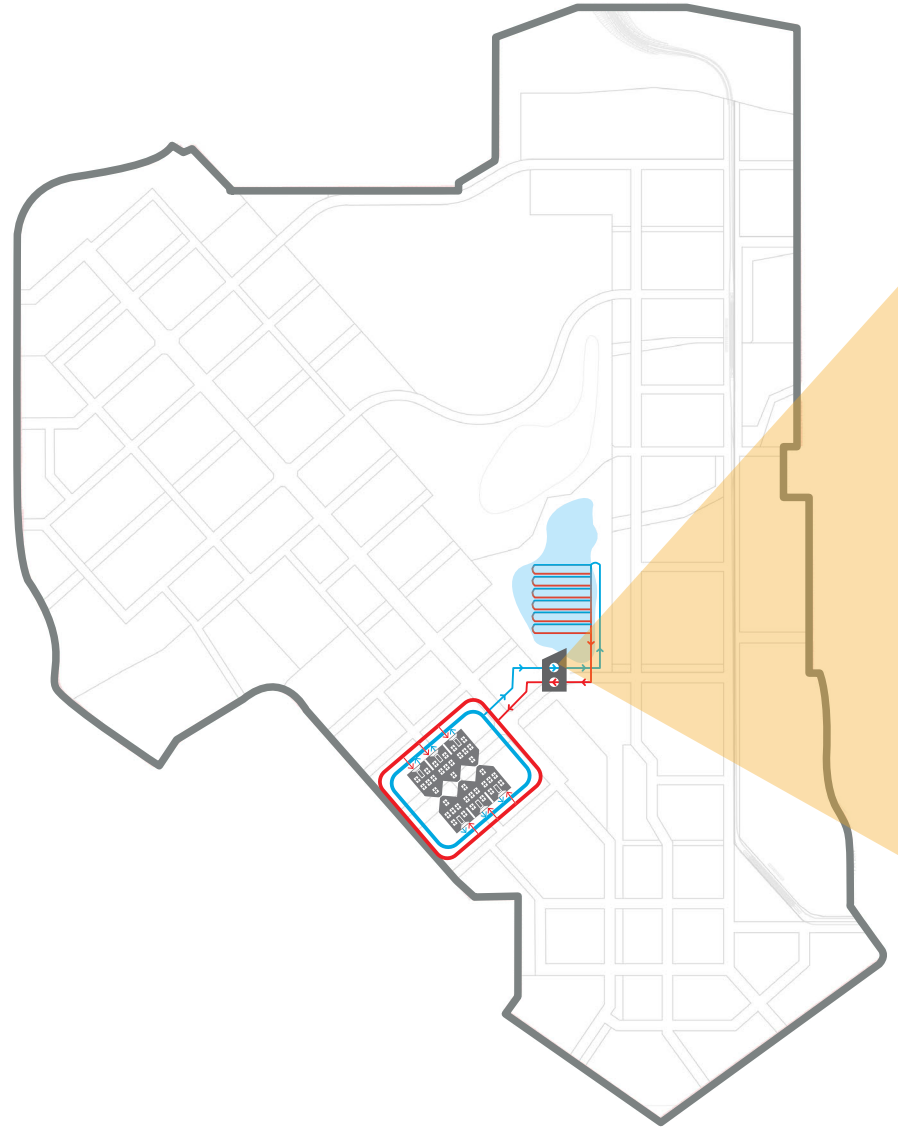
Renewables

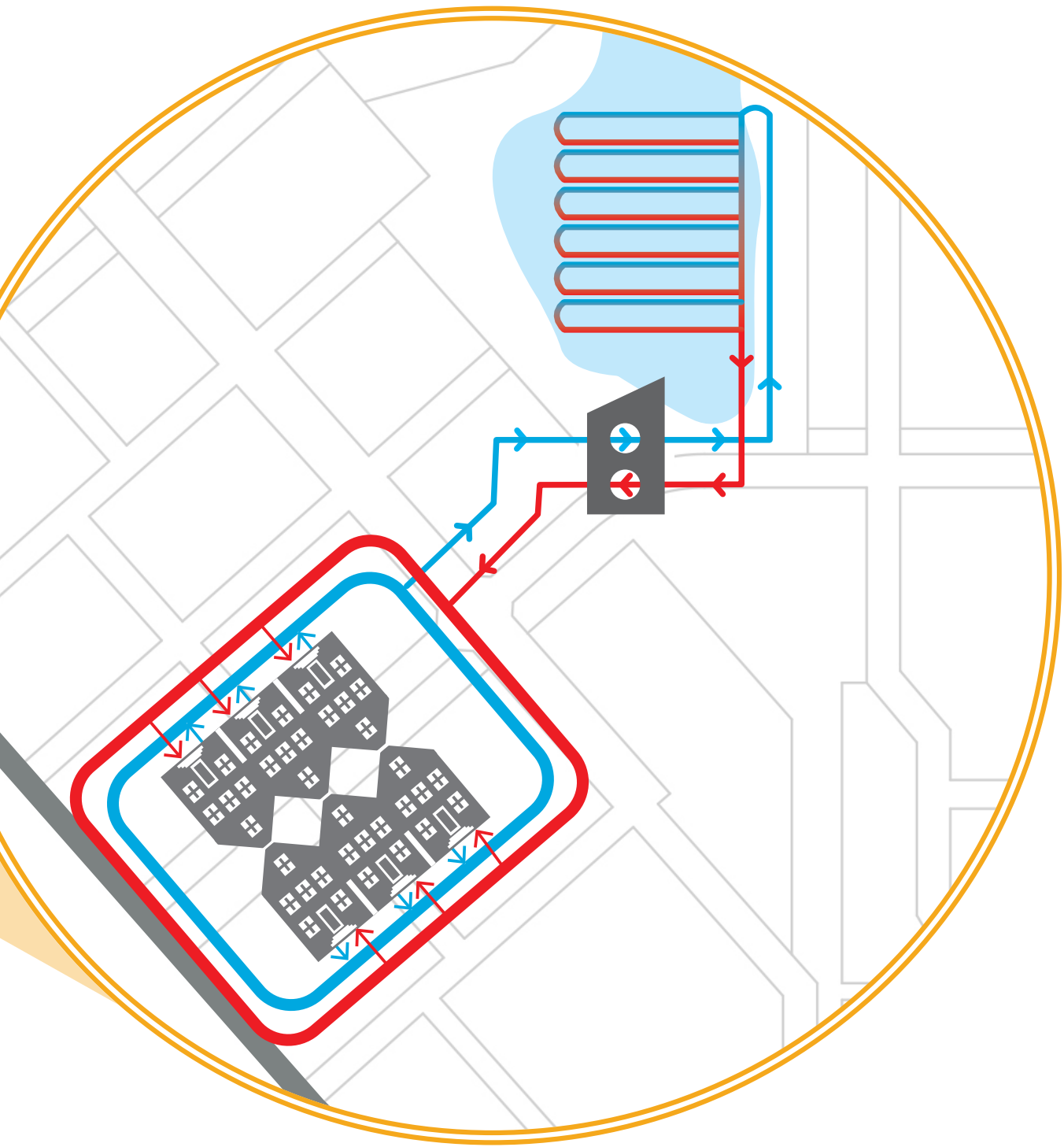
Blatchford will incorporate renewables as the primary source of thermal energy. Two proposed sources will provide on-site renewable thermal energy to the DESS: geo-exchange and sewer heat exchange.

Solar PV can be used to offset the electricity needed to run the DESS mechanical equipment.

Stage One: Geo-exchange

The first geo-exchange field will be installed under the stormwater lake as part of the Stage 1 residential development in Blatchford.









Geo-exchange

Geo-exchange harnesses the shallow geothermal energy in the soil and groundwater below the earth's surface. In the winter, a geo-exchange system draws heat from the ground for heating, and in the summer, it uses the ground to reject excess heat to provide cooling.

Shallow geothermal energy is a low-grade energy source, which is not warm enough on its own to use as a direct source of heating. To use this energy as a source for heating or cooling, a heat pump is required to move and upgrade the thermal energy from the ground to the buildings.

Stage One: Energy Centre

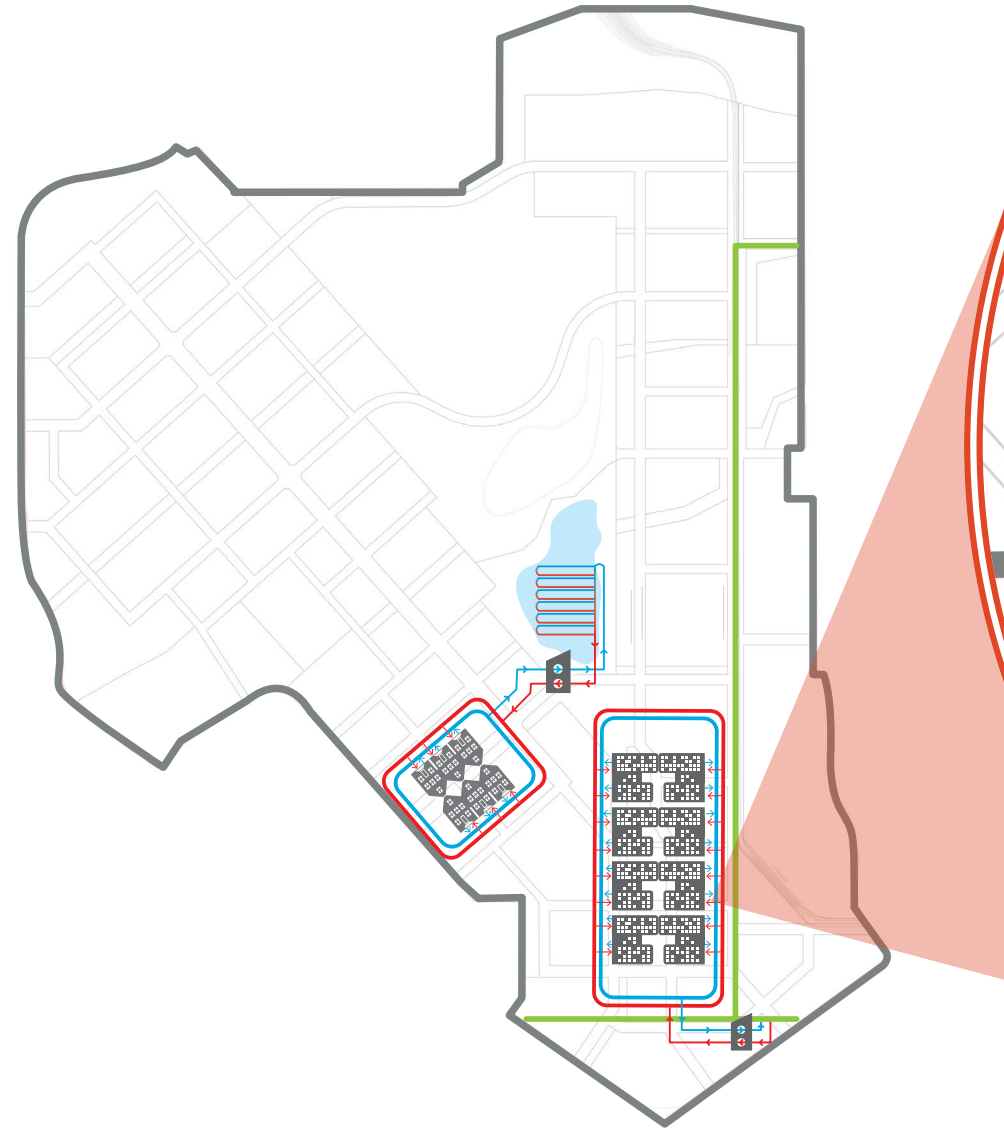
An energy centre that houses the centralized mechanical equipment of the DESS system will be built in the park. The centre will provide Blatchford residents and visitors to an opportunity to learn about how the community will achieve carbon neutrality and use of 100 per cent renewable energy.

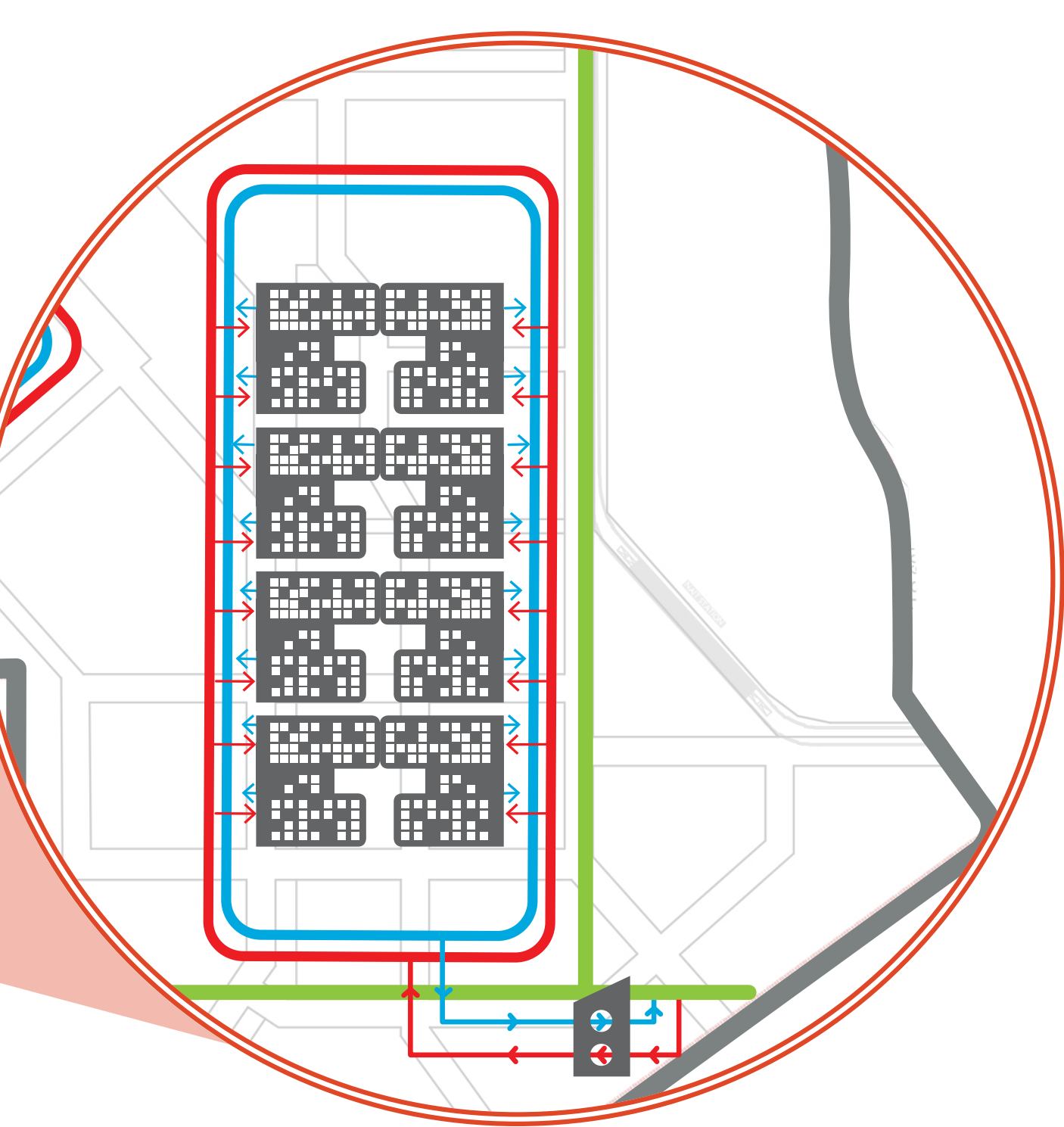




Town Centre: Sewer Heat Exchange

There are two major existing combined sewers, which run under the Blatchford site and converge under the future Town Centre. These sewers provide a high volume of ambient temperature wastewater, which through sewer heat exchange (SHX) can be used as a substantial source of renewable energy for the district energy sharing system.









Sewer Heat Exchange

In a Sewer Heat Exchange (SHX) system, wastewater is diverted from the sewer, screened and sent through a heat exchanger. In the winter, heat is transferred from the wastewater to the DESS, and in the summer excess heat is transferred from the DESS to the wastewater. The wastewater is then returned to a downstream point in the sewer.

SHX makes an excellent energy resource for both heating and cooling when paired with an ambient temperature district energy sharing system. Generally, wastewater is of a similar temperature to an ambient DESS and contains a substantial amount of recoverable energy.

Town Centre: Energy Centre

The SHX Energy Centre will be developed as part of the Blatchford Town Centre.





ORD SHX

BIOTECH

BLATTFORD RD





Solar PV

While geo-exchange and sewer heat exchange systems are sufficient for meeting the thermal energy demand for Blatchford, the mechanical equipment within the systems relies on electricity to operate. In Alberta, where the carbon intensity of our electrical grid is relatively high, this poses a significant challenge to ensuring the carbon neutrality and fossil fuel independence of the Blatchford district energy sharing system.

One proposed solution to address this issue is the installation of on-site solar photovoltaic panels (solar PV) to offset the greenhouse gas emissions associated with the electricity used by the DESS.

Due to high capital costs, the purchase of solar PV has not been factored into this district energy plan at this time. However, the cost of solar PV has been decreasing steadily. Future pricing, coupled with rising electricity costs makes this option promising and worthy of further investigation.



Full Buildout

The DESS is a highly flexible system, capable of incorporating the latest innovations in renewable energy. By implementing the Blatchford energy strategy and the DESS in stages, the City can monitor performance ensuring that the DESS can continuously improve.

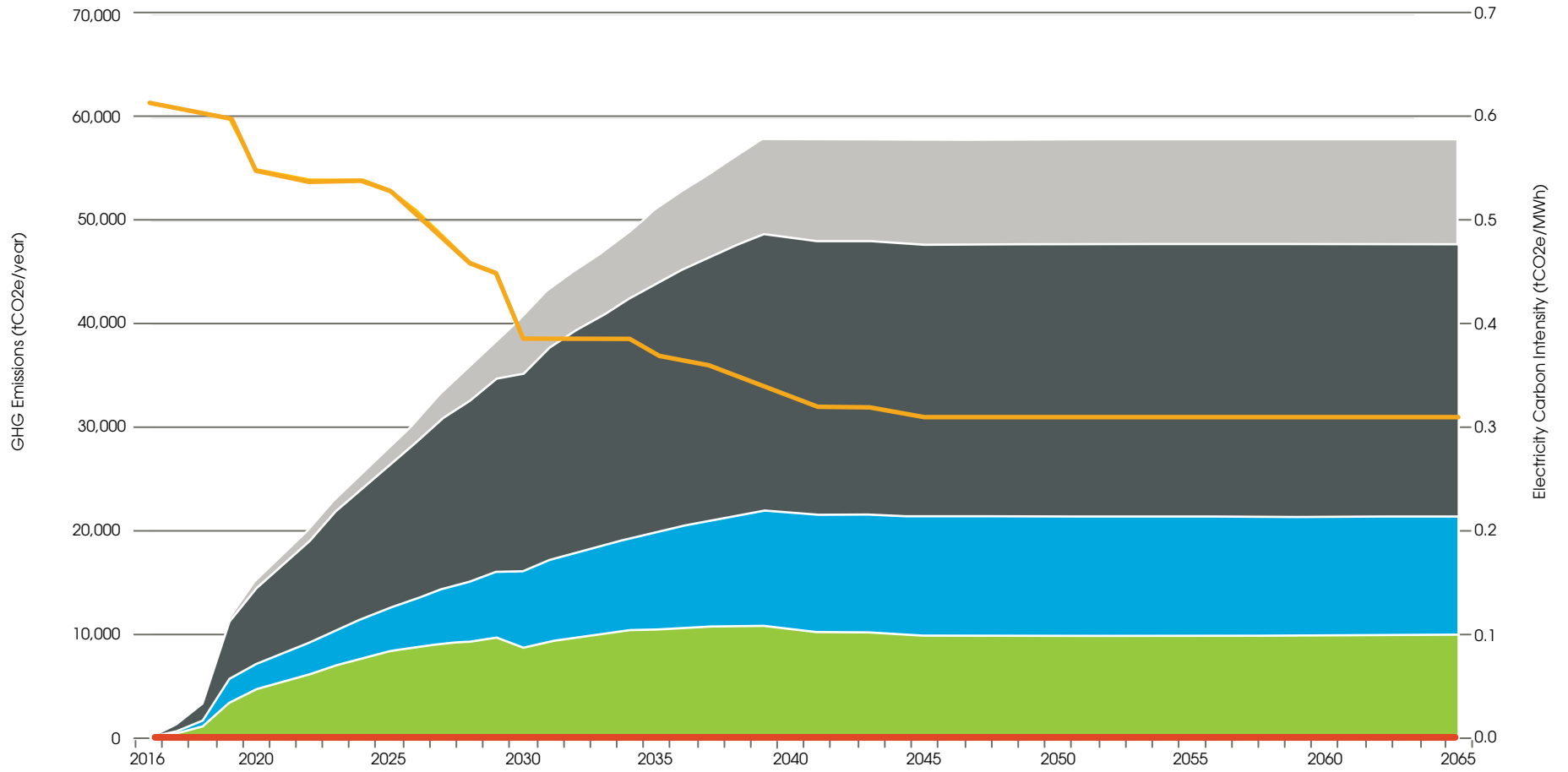
Greenhouse Gas Reductions

Implementing the comprehensive Blatchford energy strategy will significantly reduce the neighbourhood's greenhouse gas (GHG) emissions.

The Blatchford high performance building envelope will reduce GHGs by approximately 55 per cent. The DESS with geo-exchange and sewer heat exchange will reduce emissions by a further 23 per cent, for a total projected reduction of GHG emissions of 78 per cent compared to business-as-usual.

As solar PV is implemented, or as future renewable energy sources become viable, Blatchford has the potential reduce its GHG emissions associated with heating, cooling and domestic hot water by 100 per cent.

Blatchford GHG Emissions by Year



Current Building Code
 Current Building Code with Grid Greening
 Blatchford Building Code
 Blatchford DESS
 Blatchford DESS with PV
 Electricity GHG Intensity (Alberta Grid)



GEO BYPASS

GEO

ARMSTR



World Leading Sustainability

Blatchford could influence the way the world thinks about sustainable development.

By choosing a flexible approach, focused on meeting a specific goal, Council can ensure that as renewable energy innovation continues, the Blatchford DESS can adapt and improve. The DESS will be able to incorporate the best ideas of the day, inform future developments and establish the City of Edmonton as leader in community-led renewable energy.



Blatchford

BlatchfordEdmonton.ca