

# Low Carbon Electrification

Designed by Prism Engineering, pipes between Vancouver's Kitsilano Community Centre and arena transfer heat from the ice plant to the building's HVAC and domestic hot water systems – cutting facility greenhouse gas (GHG) emissions by more than 80%.

Low carbon electrification (LCE) is the reduction of greenhouse gas (GHG) emissions using clean electricity instead of other forms of energy such as natural gas, diesel, propane, and gasoline.

Prism is dedicated to helping you address climate change through reducing GHG emissions from the built environment. With over 30 years of industry experience, Prism has a proven track record of solving complex system integration issues with our **in-house team of electrical, mechanical, and energy engineers.**

## Our services include:

**Study:** Evaluation of energy use and emissions and technical recommendations which consist of concept designs that reduce GHGs emissions by switching to a lower carbon energy source.

**Quantify:** Engineering calculations and modelling of projected energy savings, emission reductions and project costs.

**Feasibility:** Review of existing building systems including electrical capacity for suitability of proposed measures.

**Business Case:** Presentation of energy cost and GHG emission savings, incentive funding, returns on investment, and non-energy benefits for LCE measures.

**Implementation:** Detailed mechanical and electrical design and engineering support for the implementation of LCE measures.

**Monitoring & Verification:** Post-retrofit utility and meter data analysis to ensure anticipated savings are achieved, and to allow for project success to be shared.

## Climate Leadership and Financial Savings

The Government of British Columbia's CleanBC plan is aimed at reducing climate pollution while creating more economic opportunities for local communities. LCE is already playing an important role in this plan.

LCE provides an opportunity for asset renewal and can also result in significant operations and maintenance savings. Organizations often benefit from incentives and subsidies to support the capital investments required.

Our holistic approach considers all building systems and loads within a facility, ensuring the highest level of GHG emission reduction is achieved.

# Case Studies



## Office Building at 830 W. Pender Street, Vancouver, BC Chiller replacement with heat pump system

An end-of-life chiller replacement project provided an opportunity to reduce carbon. Chilled water coils were replaced with refrigerant coils connected to heat pumps for each of the four floors. This enabled the use of electricity for primary heating and offset fuel use in winter and fall months.

**Results:** 42% GHG reduction and over \$35,000 in energy costs saved over 3 years



## City of Cranbrook Western Financial Place Pool heating through dehumidification heat recovery

Prism conducted an energy audit, followed by detailed design and specification for a new heat recovery chiller to provide pool dehumidification heat recovery to offset pool heating by natural gas boilers.

**Results:** Reduced natural gas consumption by 4,100 GJ/year (equivalent to approximately \$35,000/year in natural gas savings) and approximately 220 tons CO<sub>2</sub>e/year of GHG reductions, or 30% of sitewide emissions.



## Vancouver General Hospital (VGH) Heat recovery chiller

Prism completed the detailed design, engineering construction management (implementation support), and commissioning support for the heat recovery chiller system. The heating system was running constantly and previously served by steam boilers for heating, resulting in high GHG output.

**Expected results:** The new heat recovery chiller system is expected to save over 88,000 GJ/year of natural gas, 4,400 tCO<sub>2</sub>e, and approximately \$80,000 in avoided energy costs.



## School District 36 - Jessie Lee Elementary

Leveraging the CleanBC Custom-Lite feasibility program, Prism led the study, detailed design, engineering construction support, implementation and commissioning support for converting the existing gas fired rooftop units to a hybrid gas and electric heat pump system.

**Expected results:** The project is expected to achieve an annual GHG emission reduction of 75%.

Photo credit: Western Financial Place (City of Cranbrook) and Jessie Lee Elementary (Google).