Southwoods Sustainable Community Energy System: Building the Heat Storage Industry

Christenson Developments Ltd (CDL) is redeveloping Southwoods' 19-acre townhome rental community, increasing densification by building seniors’ apartment complexes and energy efficiency retrofits to the existing townhomes. With its partner GSS Integrated Energy Ltd., CDL combines inner city redevelopment and energy self-reliance in an established neighborhood near Edmonton’s downtown. To service Southwoods, CDL installed a CHP-BTES integrated system for electrical, domestic heating, cooling and hot water supply for 424 residential units. The project avoids urban infrastructure upgrades, and reduces demand for potable municipal water. Combined heat and power (CHP) provides an opportunity to generate power and heat on site. However the project has a number of challenges including balancing the need for power versus heat, optimal sizing and control, and thermal storage. Borehole thermal energy storage (BTES) provides a solution to temporal and seasonal mismatch in heat production and consumption, allowing the CHP to be sized for peak power, and offsetting costs by selling unused power to the grid. The Southwoods CHP-BTES project showcases the economic viability of small-scale integrated CHP-BTES systems, and represents an important next step in building a heat storage industry, a key component for sustainable community energy systems.

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