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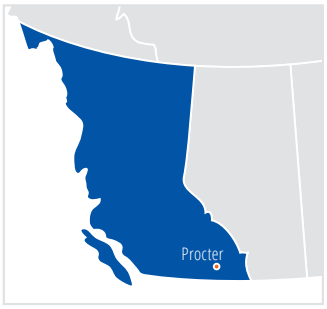
ENERGY EFFICIENCY CASE STUDY

Procter Old Schoolhouse



Significant energy retrofits on Procter's historical schoolhouse have reduced energy consumption in the building and greatly improved comfort with all new doors and windows. This was a great project that the community takes pride in.

Summary

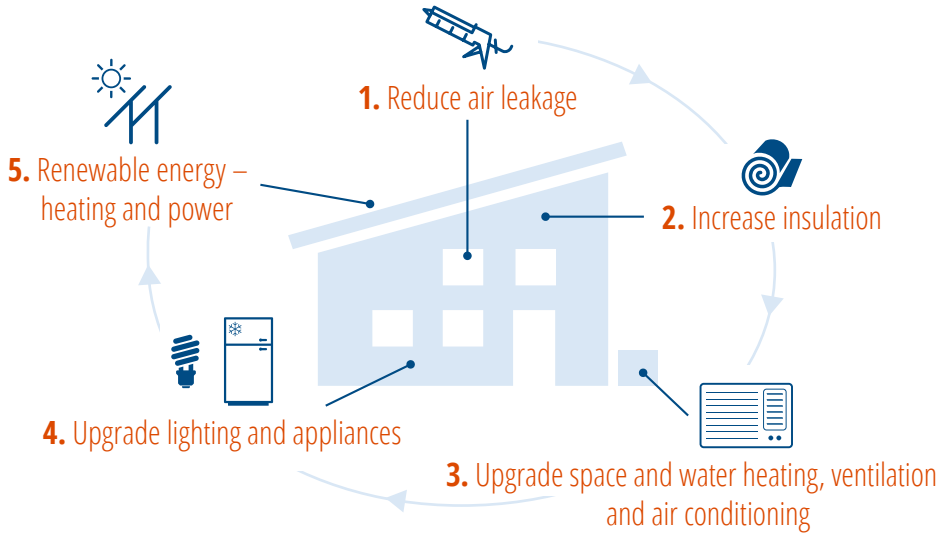
The Procter Old Schoolhouse is located in Procter, B.C, and serves as a community building for several small businesses and services: the local library, a bakery, a community forest cooperative, a hairdresser, a chiropractic office and a small pottery shop.

With support from the Regional District of Central Kootenay's (RDCK) Area E Community Development Grants, a detailed energy audit was performed on the Old Schoolhouse. The audit modelled the building energy consumption for space heating, ventilation, hot water use, indoor / outdoor lighting and appliance use. A prioritized list of recommended energy efficiency improvements was developed, and the owner of the building, the Procter Community Association, chose specific upgrades to make. The work was completed in the fall of 2015.

Project highlights

- Large projects of this size require significant co-ordination to handle various trades and ensure work is completed on budget and on time.
- Very simple energy efficiency measures can drastically reduce energy consumption in an older building.
- Air-source heat pumps that work in moderate winter conditions are an excellent technology upgrade and much more efficient than electric baseboard heaters. Mini-split heat pump systems, when carefully planned, can work well for a building with multiple tenants with separate spaces that share utility meters.
- Space cooling functionality is an essentially "free" byproduct of upgrading to an air-source heat pump system. Designers should understand both the heating and potential cooling demands for mixed tenant types for the building and plan accordingly.. Landlords should also anticipate tenants using the cooling functionality and be prepared for higher utility bills in warmer months.

Energy upgrades make financial sense



Upgrades are often prioritized using a tiered approach

Rising energy costs can be a burden to the operations and budget of a non-profit society, especially if they own or lease older buildings that suffer from structural neglect, poor energy performance and aging heating systems.

Very simple and effective energy efficiency upgrades can help reduce utility bills. Upgrades are often prioritized using a tiered approach that focuses first on improving building envelope, then heating systems and then lighting / appliance technologies, as illustrated here.

About the Procter Old Schoolhouse

The Procter Old Schoolhouse is a two-story 4,600-ft2 wood-framed structure that includes several office spaces, a bakery and common washrooms and storage. It was originally constructed as a single room schoolhouse in 1913 using standard construction techniques. Changes to the building have occurred over the years and include various additions, improved insulation and changes to the heating system (from oil furnace to electric baseboard heaters).

Before

- Exterior walls: standard 2x6 construction, with blown-in cellulose insulation in main walls covered with lapped wood siding
- Roof: metal clad on 2x6 framed trusses
- Windows and doors: original since construction and not very energy efficient
- Heating: standard electric baseboard heaters on mechanical dialed thermostats
- Lighting: mixed single bulb and dual T12 fluorescent light fixtures

Energy efficiency findings

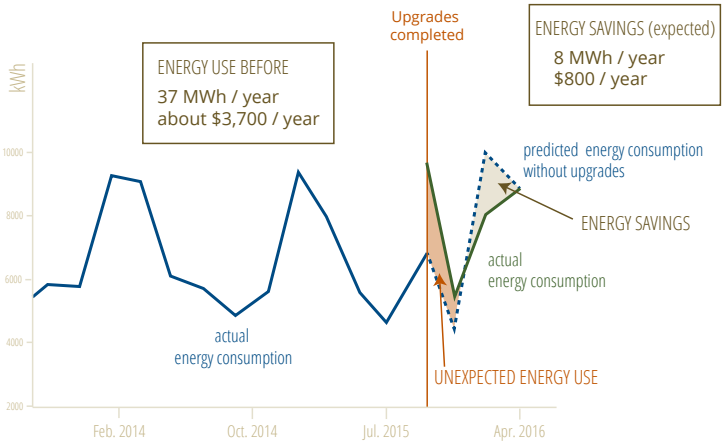
- Inefficient older heating system
- Significant air leakage through walls and old, drafty windows and doors
- Insufficient insulation in ceiling and storage area walls
- Inefficient older lighting technology
- Old, inefficient kitchen appliances
- Old, inefficient hot water tanks

Recommendations

Six energy efficiency recommendations were provided that together could potentially save 25,000 kWh / year of energy. Four of the six energy efficiency measures were taken on by the Procter Community Association. The project was substantial, took seven months to complete and cost around $125,637 which was provided by grant money from the RDCK Area E Community Works Fund.

Energy profile: before and after

Based on actual utility data collected for six months after the work, energy savings from the upgrades do not appear to be as high as anticipated. This is likely because the newly-available air conditioning was used in the fall months by some tenants, increasing electricity consumption. Even with this additional use, energy reductions were observed and with proper management of air conditioning use, the building should see further energy reductions in the future. Testing after upgrades showed that air leakage was reduced by 24% (which alone corresponds to an energy savings of 10%).



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