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**centre**

*in the centre of it all*

**Net Zero Energy Construction:  
Benefits for Municipal Capital  
Projects  
(Coldstream New Fire Hall)**

# Background

- In August 2013, Council formally received Fire Services Master Plan
- Plan recommends need for new fire hall
- To replace current 2,098 sq./ft. fire hall originally built in 1877.
- In very poor condition and does not meet current standards for a functioning fire hall
- High energy condition/poor insulation

# Coldstream Fire Hall (2,098sq/ft)





# Background (Cont'd)

- Two sites were considered: former Municipal Works Garage & a Greenfield site
- Council chose former Municipal works garage
- On same premises as Coldstream Municipal Office
- In April 2014, Fire Chief form building committee.

# Procurement

- Expression of Interest invitation
- Three firms responded
- Based on background, past performance G. Douglas Valle Limited were selected.
- Initial Class C estimate: \$2.4 million

# CMHC defines “net-zero energy housing”

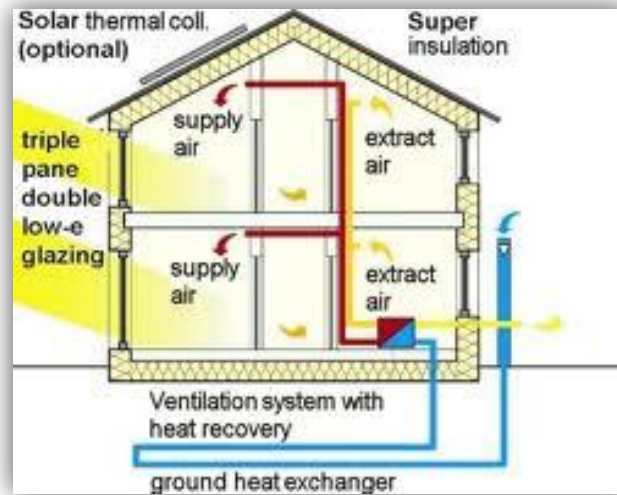
*“..producing as much energy as it consumes annually...”*.  
**(Net Energy Produced = Net Energy Consumed. Hence Net Zero energy)**

# 6 Guiding Principles to Net Zero

- Building Orientation (maximise southerly exposure)
- Building Envelope (air-tight structure)
- HVAC Systems (use of ground source heat pumps, solar water heating, etc.)
- Energy Production
- Energy Audit/Modelling
- Occupant Use/Performance Monitoring



# Net-Zero design



# Process to Net Zero Energy!

- Funding proposal to FCM for feasibility studies
- Proposal Granted: 6-month feasibility studies.
- Feasibility Report: Recommend net zero energy fire hall with ground source heat pump.
- Hence, net zero carbon on site.

# Capital Project Funding

- Capital project application to FCM
- \$2.6 million loan
- \$393,200 grant (Grant of 15% Of Loan)



# Municipal Office (5,995sq./ft.)



# Vacant Site (Old municipal garage)



# Construction on the way.....



# New Coldstream Fire Hall



# Coldstream Net Zero Energy Carbon Neutral Fire Hall

- 9,900 sq/ft fire hall
- Annual energy demands [**55,800kWh** with GSHP]
- 60kW Solar PV that will generate **70,600kWh** on-site renewable energy
- Enough energy generated on-site to off-set annual energy demand of building.





# Financial Returns

## Sustainability Package: GSHP with 60kW Roof-Mount:

Net Present Value	\$124,644
Net Savings	\$366,021
Internal Rate of Return	10%
Simple payback	9yrs

# HPNC: *SaveonEnergy* Incentives

- \$10,000 incentives for cost of energy modelling
- \$400/kW of verified energy savings (25% above OBC)
- \$600/kW of verified energy savings [Between 25% to 50% above OBC]
- \$800/kW of verified energy savings [Above 50% OBC].



# Benefits to Municipality

- Reduced operation cost of property
- Lesser energy cost (reduce/eliminate electrical peak demand)
- Greater occupant comfort and improved in-door air quality
- Regulation 397/11 expectation to reduced energy consumption and GHG emissions
- In supporting of Provinces' Climates Change Action Plan - Target of net zero housing by 2030



# Challenges/Barriers

- Lack of support from your technical team (i.e. Architects, Civil/Mechanical Engineers, Planners, etc.)
- Unwillingness to do things different (Paradigm Shift)
- Business-as-Usual approach



# Green Life Condo's in Milton



# Thanks for Your Attention!!!

- Questions???
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