

Finance and Costing Challenges for Green Buildings in the North



Bill Semple, Architect
NORDEC Design and Consulting
Ottawa, Ontario, Canada
wsemple@ualberta.ca

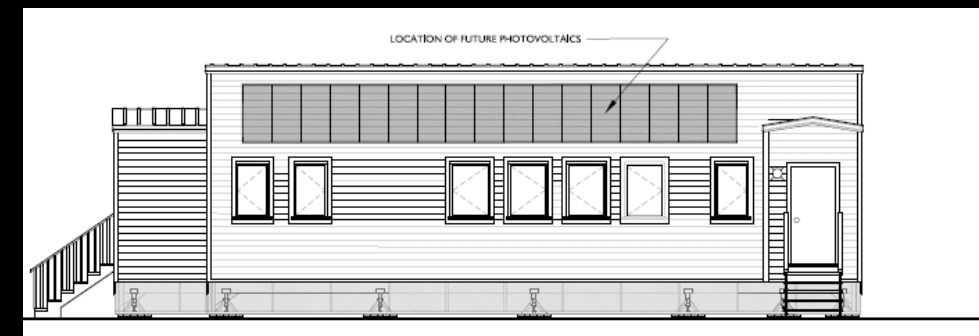
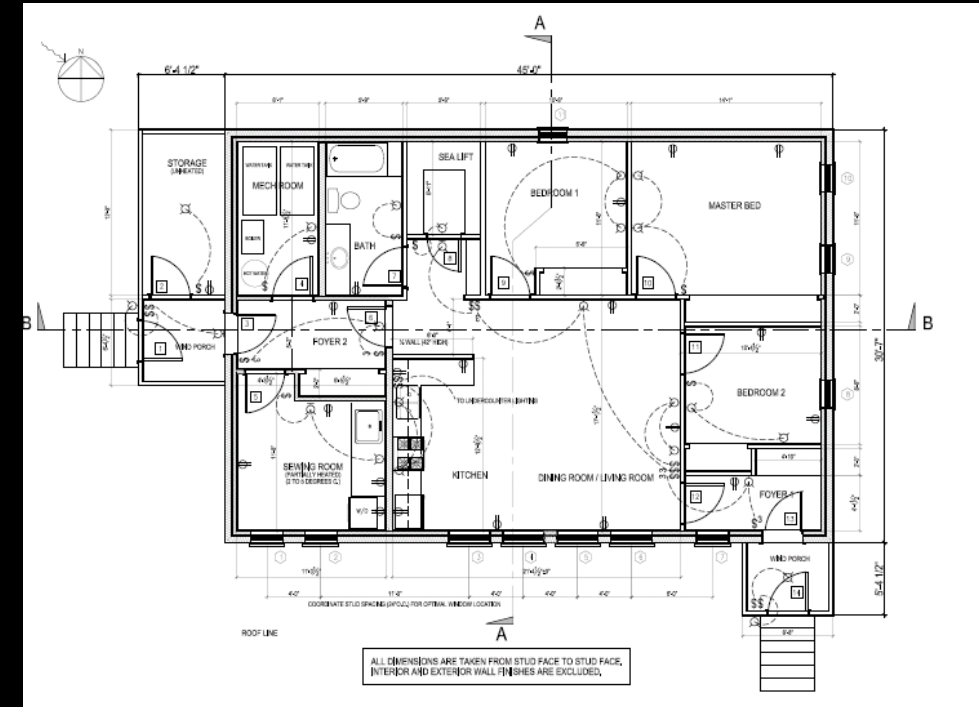
Costing Innovation – The Incremental Costs of Super Energy Efficiency

Developed housing prototype for the Nunavut Housing Corporation (NHC) including:

- Culturally appropriate design process and design
- Key component: Covering the incremental costs of going from present to proposed energy efficiency levels

We learned:

- Providing incremental costs was key to bringing NHC to the project
- Importance of bringing different financing programmes together
- True additional costs for energy innovations cannot be accurately determined on the first project.
- Supporting research and consultative approach established new performance levels for housing in the territory



Building Upon Lessons Learned – Dawson City, Yukon

The E2 House – 50 % reductions:

- Designing house to fit needs of community and local building skills
- Key lesson: While the building system worked well, HVAC system increased costs

The E9 House

- Simplified heating system and put cost savings into improving the building envelope (Moved from 50% energy savings to 70% energy savings at no additional cost per square meter)

Next Step – New Housing Models

- Developing multi-unit housing model in Nain
- Will deliver significant savings in construction and land development costs
- Savings being put into housing for seniors and young people



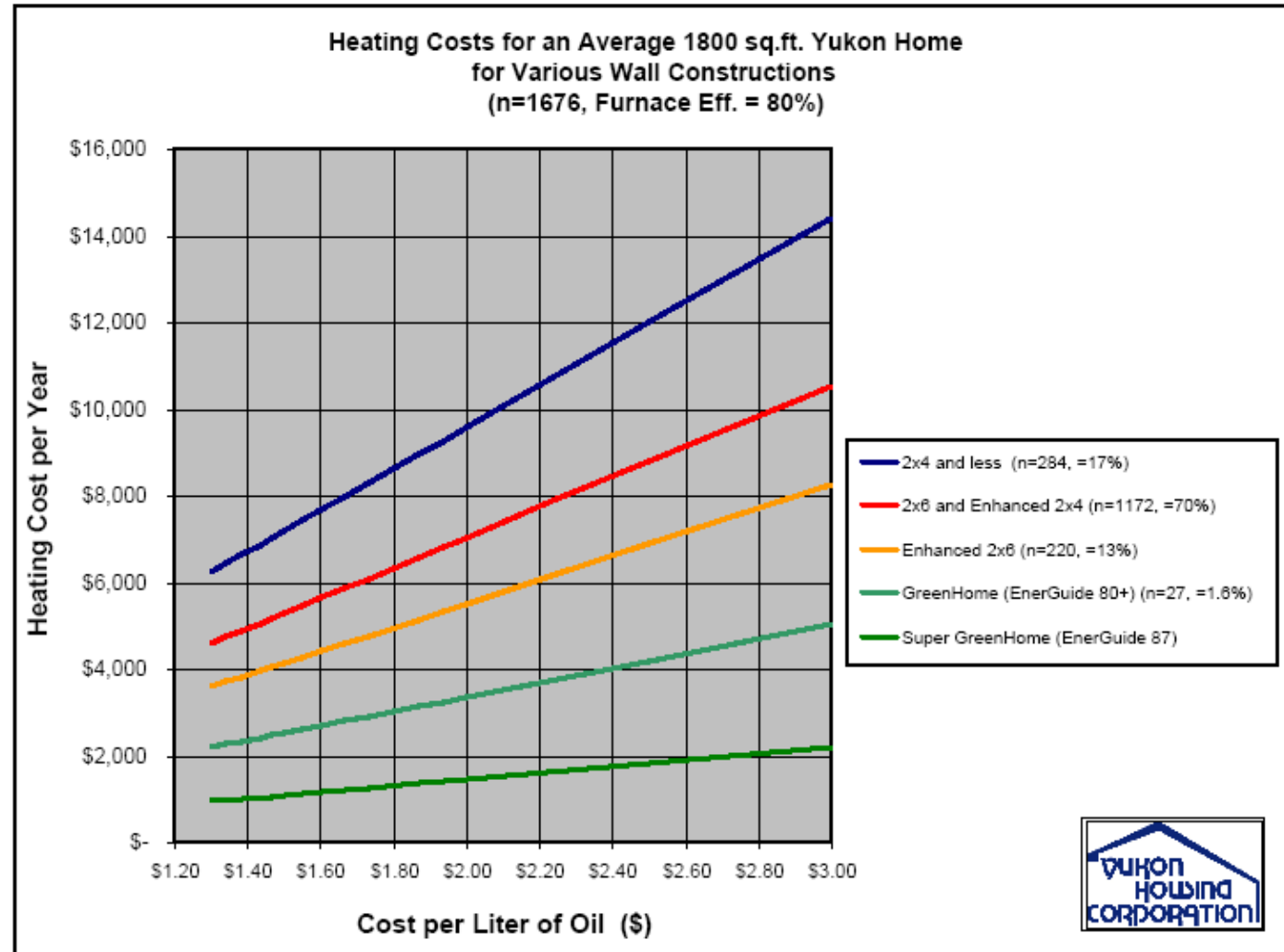
Existing Houses: Strategies for Super Energy Efficient Retrofits

- The first 10 to 15 percent of savings are straightforward and inexpensive
- Beyond this we are developing building systems that can accommodate a range of increasing insulation values (e.g. Exterior use of wall truss and blown insulation)
- Costing of projects are often only made possible when combined with an ongoing renovation and retrofit programme or initiative
(For e.g. NWT Housing Corp has ongoing renovation initiative – up to 80% of cost of new construction to extend the life of existing homes for an additional 25 to 30 years)



Understanding Motivations:

- CMHC research on the Equilibrium (net zero energy homes) showed that homeowners, while attracted to high energy efficiency) comment more positively on issues of comfort
- In the north, issues of climate change and energy security are the motivating issues
- The Yukon Housing Corporation adopted their Super Green standard for social housing in the territory based on recognition of need for longer term energy security in the north



Developing Alternative Costing Methods

- Removing the separation of capital and operating costs

(Note: often means bringing together different departments or different agencies together)

- Eliminating 'years for payback' as the method of calculating investment return

- Evaluating how energy savings can pay for investment in significant improvements in building performance (e.g. Utilizing mortgage calculations)

- Using this data and approach to generate support for stable long term funding

Example – Yukon Super Green Programme

	COST DIFFERENCE	COST / SQ. FT.	MORTGAGE DIFFERENCE	NET COST
Standard Construction	\$0	\$150	\$0	\$0
GreenHome (2x6 with 2x3)	\$8,000	\$155	\$44	\$ - 93
SuperGreen	\$24,000	\$165	\$133	\$ -74