Newfoundland and Labrador
Board of Commissioners of Public Utilities

Muskrat Falls Review

Public Presentation

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Efficiency

- It is the intent of this presentation to challenge the low weight and low value placed by our power companies on the efficiency component.
- Efficiency is a component used in the forecast models , which allows a reduction against increased growth.

End-Use Methods

- The MHI report say our power companies do not use “end-use” methods to quantify energy efficiency claims - as being done in other provinces.
- Since energy efficiency should be driving significant reduction in energy use, we submit this is a serious error in their methods.

Forecast

- The forecasts show a reduction from this technology change factor of 178 GWH (plus 8 percent for reduced transmission line losses) total of 20 years .
- This is only .002 reduction from the total domestic load, two tenths of one percent, $3.67 for each domestic customer.

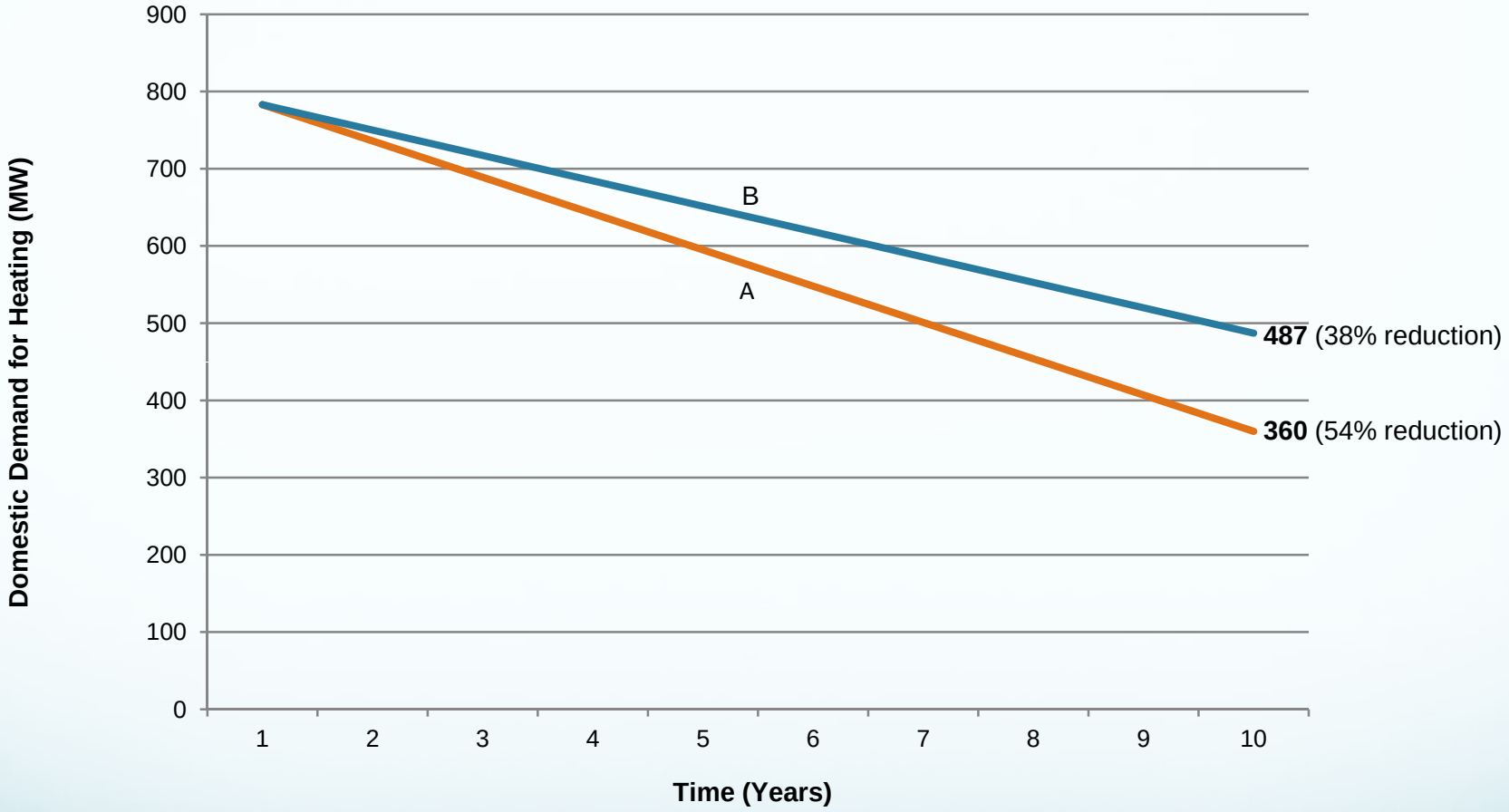
MHI Report Assumption

- It is assumed that savings in the future will be 30 percent more difficult because most cost effective improvements have been done.

Heatpump Challenge

- On average, for our climate, these systems save about 60 percent on energy use . They will cut the contribution to the winter time peak by the domestic sector by 50 percent if the units are fully utilized as the only heat source. This means a 423MW potential peak demand reduction (allowing transmission line loss reduction), but 296 MW reduction if used for 70 percent of a house's heating needs.

Domestic Heat Peak Demand Reduction by High Efficiency Heatpump's with Inverters

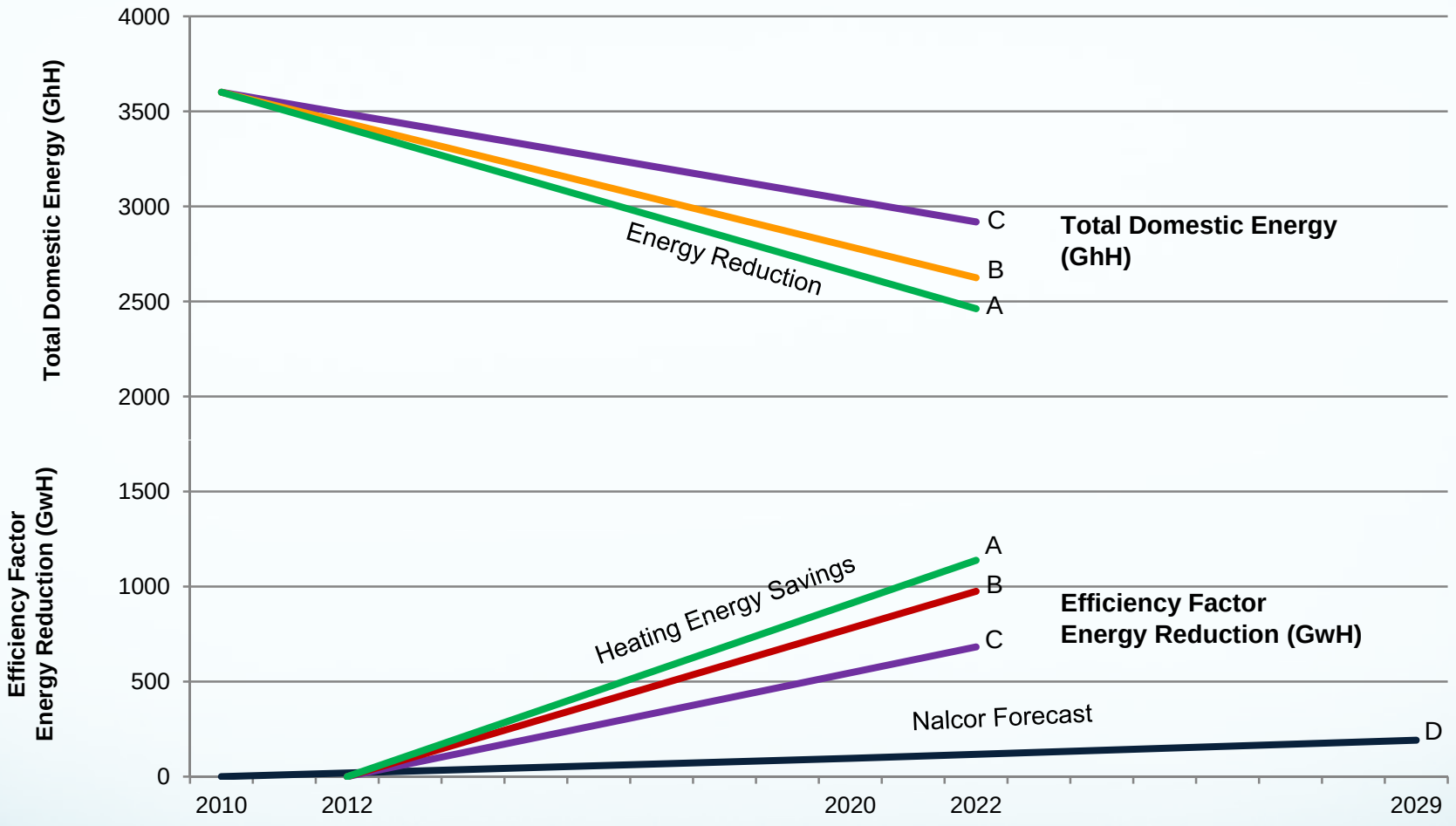


Line A Assumes High Efficiency Heatpumps having full coverage gives 423MW reduction
Line B Assumes High Efficiency heatpumps with 70% coverage gives 296MW reduction

Note 1 150,000 electric heated homes at 5.2 KW each.
Note 2 Heatpumps at 50% reduction in KW input at -18C.
Note 3 Allowance made for transmission line loss of 8 percent.
Note 4 Assume no new additional domestic energy uses.
Note 5 Assume conversion of 150,000 houses over 10 years

Heatpump Challenge

- We submit that it is possible to obtain a potential energy reduction of 1138 GWH and it is reasonable to obtain a reduction in energy use of 622 GWH in just 10 years from the domestic space heating use alone.
- This reduction is available with efficiency improvements in the heating systems - using electromechanical heating systems (heatpumps) with inverter technology.



Line A allows for 150,000 electric heated homes converted over 10 years getting 70% reduction for heat (enhanced)
Line B allows for 150,000 electric heated homes converted over 10 years getting 60% reduction for heat (normal)
Line C allows for 150,000 electric heated homes converted over 10 years getting 60% reduction for heat but only 70% coverage.
Line D is Nalcor forecast reduction

Line A gives 7 times Nalcor's reduction in half the time
Line B gives 10 times Nalcor's reduction in half the time
Line C gives 12 times Nalcor's reduction in half the time

Line A gives 31.6% total domestic reduction
Line B gives 27% total domestic reduction
Line C gives 19% total domestic reduction
Line D gives about 2 tenth of one percent per year reduction (2.6% over 10 years)

Heatpump Challenge

- Additional large reductions are possible if such heating systems are uses for hot water heat, and for general service small commercial.

Heatpump Cost

- These are cost effective @ about $1800.00 per kilowatt of heat production at minus 18 C. This as about 5 times less than the cost of new generation. This cost allows for installation that allows enhanced performance, reliability and longer life.

Heatpump Case Study

- We installed a type 3 mini split heatpump in a house 23 years old to obtain end-use data in our climate. It was an enhanced installation. Operation commenced in Jan 2010, It is now in it's third winter. Some buildings shell improvements were also made .

Heatpump Findings

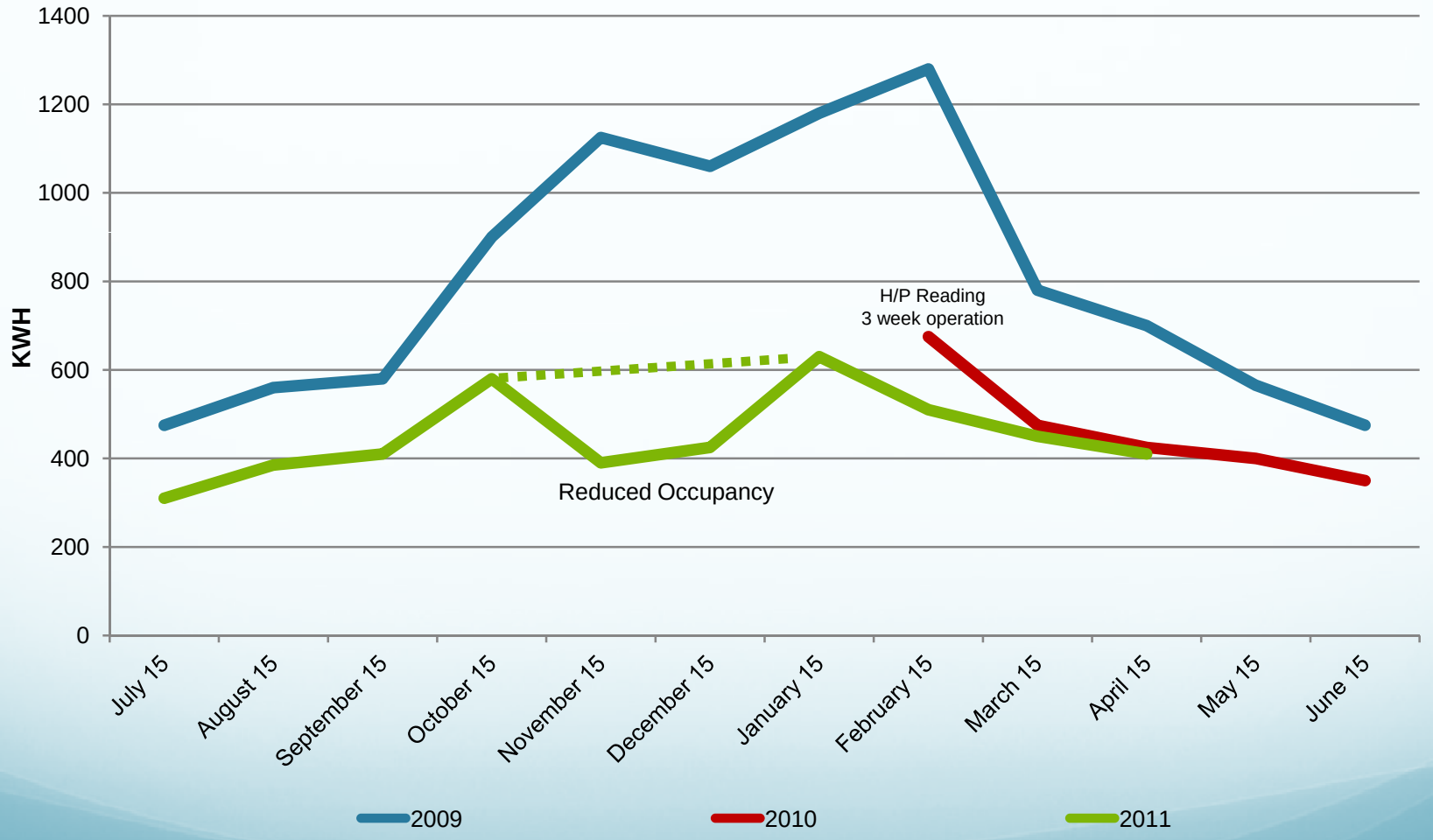
1. Yearly total energy reduction of 42%.
2. Reduced peak demand from space heating by 73%.
3. No malfunctions.
4. Benefit of air conditioning and humidity control in the summertime.

Findings

5. A positive contribution to the island electrical system: to help reduce winter peak demand; increases summer demand so it improves the load factor; Helps reduce pollution from Holyrood.

6. Reduced heating load from 5 watts per sq ft to about 1 watt. This seems to compare favorably with a R2000 house (without a heatpump) that appears to need 1.4 watts per sq ft for space heating. However ,a heatpump would further reduce energy needs in a R2000 house.

Heatpump Results



CFL: Fact or Fiction

- Such methods allow a 10 fold error in claimed savings from the modern efficient light when used indoors in Nfld. Because they produce much less heat , the regular electric must stay on longer to compensate. As we need heat about 11 months out of 12 , they save energy for about one month. The same applies to energy efficient fridges , TV's and wrapping hot water pipes. In southern climates these products save energy year round. Nevertheless , when used in our climate ,in conjunction with heatpumps, they save energy year round , because the efficient heatpump then handles this heat.

Recommendations

Reductions in energy use and peak demand from current technology in heating systems can provide substantial benefit to customers and our generating system so, consider:

1. A efficiency surtax of 10 percent on electricity sales to allow a 60 percent rebate to customers using highly efficient , inverter type systems, with enhanced installations ,and 45 percent whose installations that are not enhanced,

Recommendations

2. An efficiency corporation such as EFFICIENCY NEWFOUNDLAND AND LABRADOR, similar to EFFICIENCY NOVA SCOTIA, EFFICIENCY VERMONT, ETC. that oversees end-use research, and promotes energy efficiency that is “effective”.

Thank You