



# FortisBC Ice Rink Resurfacing Efficiency Pilot

## Study Results

June 2014



## Verified savings through FortisBC Pilot Program

Fuel	Adjusted Baseline	Measured savings	% savings (vs. adjusted baseline)
Natural Gas	418 GJ/year	330 GJ/year	79%
Refrigeration Energy for resurfacing**	78,815 kWh/year	22,400 kWh/year	28%
Total	706 eGJ/year	410 eGJ/year	58%

Generally the **ice slab thickness** was **marginally reduced** (on average 0.25 - 0.5 inch); and **increase in ice temperature** (on average 3°F) was required at all sites.

**Ice quality was evaluated to be acceptable to excellent.**

**90%** of pilot participants successfully adapted their operations to the REALice vortex technology

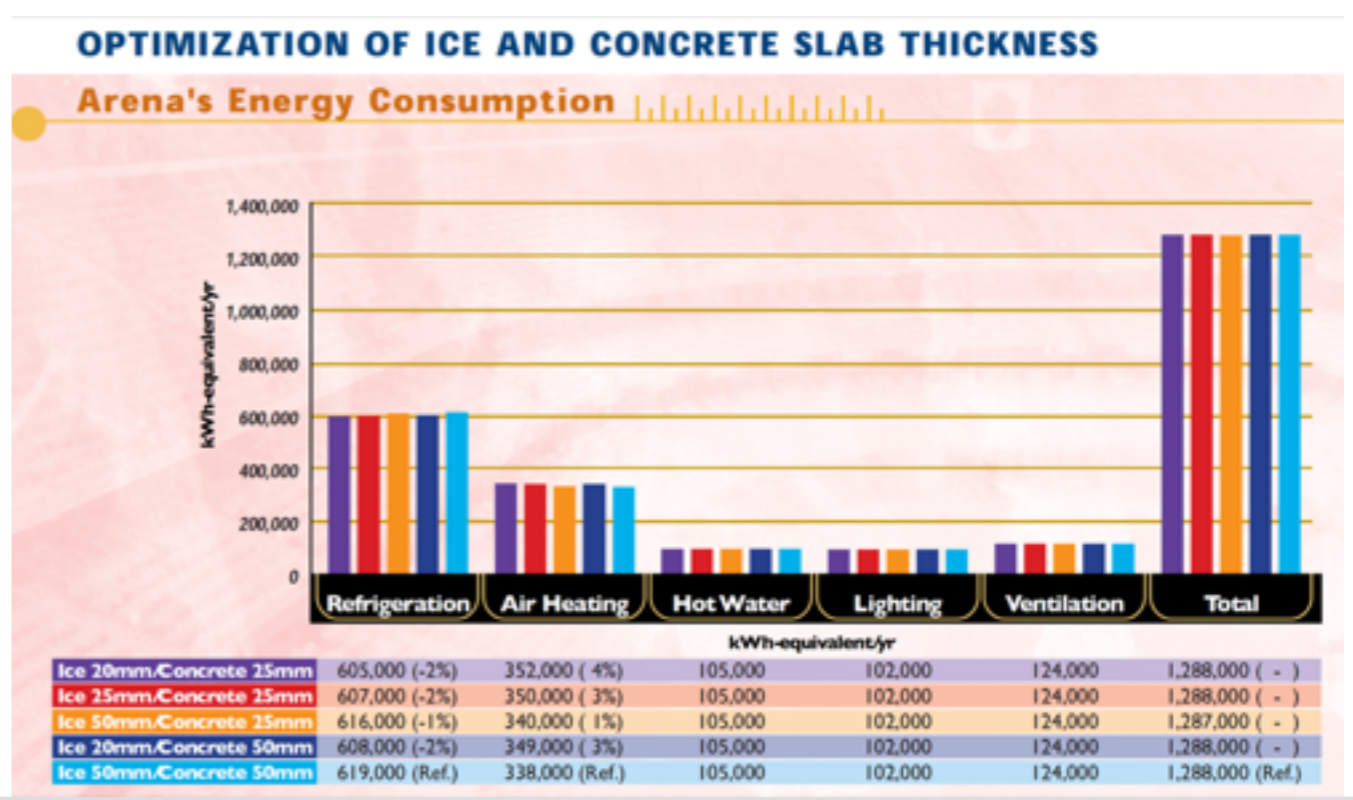
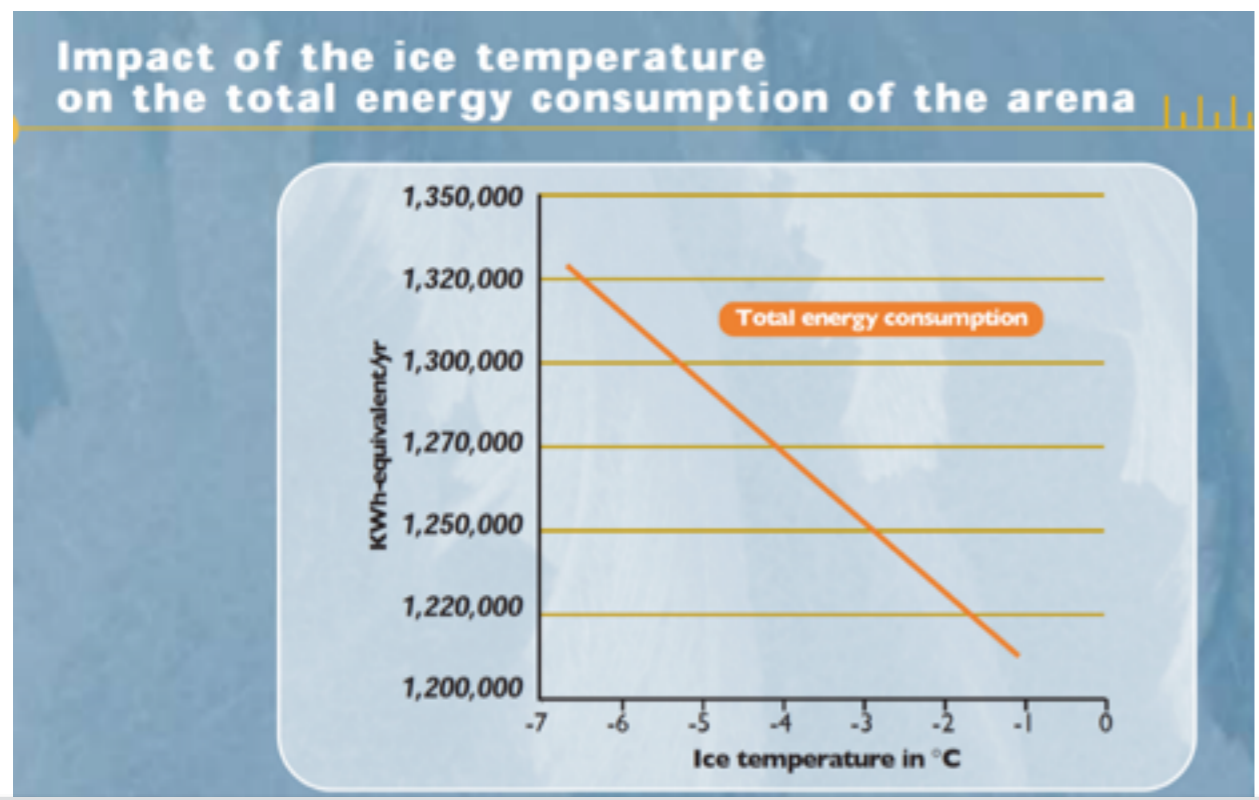
Measured savings are the average measurements based on the participating arenas. [Download the report](#)

\*\*The refrigeration energy for resurfacing was measured at three participants sites with sensors inside the zamboni and calculated on the basis of heat capacity of water, latent heat water to ice, heat capacity of ice, ratio of energy in and out and efficiency of hot water system. This represents only one part of the electricity savings.

Additional **significant electrical savings from the refrigeration plant** are realized through the **increase of slab temperature** and **reduced ice thickness** as suggested by

NRCan:[http://canmetenergy-canmetenergie.nrcan.gc.ca/fichier/81155/2003-065\\_066e.pdf](http://canmetenergy-canmetenergie.nrcan.gc.ca/fichier/81155/2003-065_066e.pdf)

**Significant electrical savings from the refrigeration plant are realized through the increase of slab temperature and reduced ice thickness as suggested by NRCan**



Source: NRCan: [http://canmetenergy-canmetenergie.nrcan.gc.ca/fichier/81155/2003-065\\_066e.pdf](http://canmetenergy-canmetenergie.nrcan.gc.ca/fichier/81155/2003-065_066e.pdf)

**Sask Power** suggest **2% - 4% reduction in electricity** usage on the refrigeration plant by raising the **slab temperature by 1°F - 2°F**.

**Manitoba Hydro** suggest that with **each degree Fahrenheit** that the **slab temperature is raised**, the load on the ice plant is reduced **by up to 2%**

**Participating arenas decreased ice slab thickness on average by 0.25 - 0.5 inch & increased ice temperature on average by 3°F**



# Participant internal Reports: Kerry Park Rec Center, Mill Bay, BC



## \* 2014 Electricity Kerry Park

**Performance period showed electricity savings of 720 kWh / day**  
Chart shows average kWh / day comparison 2011 - 2013 to daily consumption in 2014.

## Participant internal Reports: Agrodome at the PNE, Vancouver BC



**Ice System compressors** have approximately **25% less run time**

- **Hot Water Boilers** have approximately **50% less run time**
- Community User Groups consistently have hot water for showers
- Ice System Compressors and Hot Water Boilers have an increased life expectancy
  - less ice floods due to a more durable ice surface
- Ice makers use only cold water for ice floods (45 degrees F)
  - Ice temperature set point increased to 21 degrees F



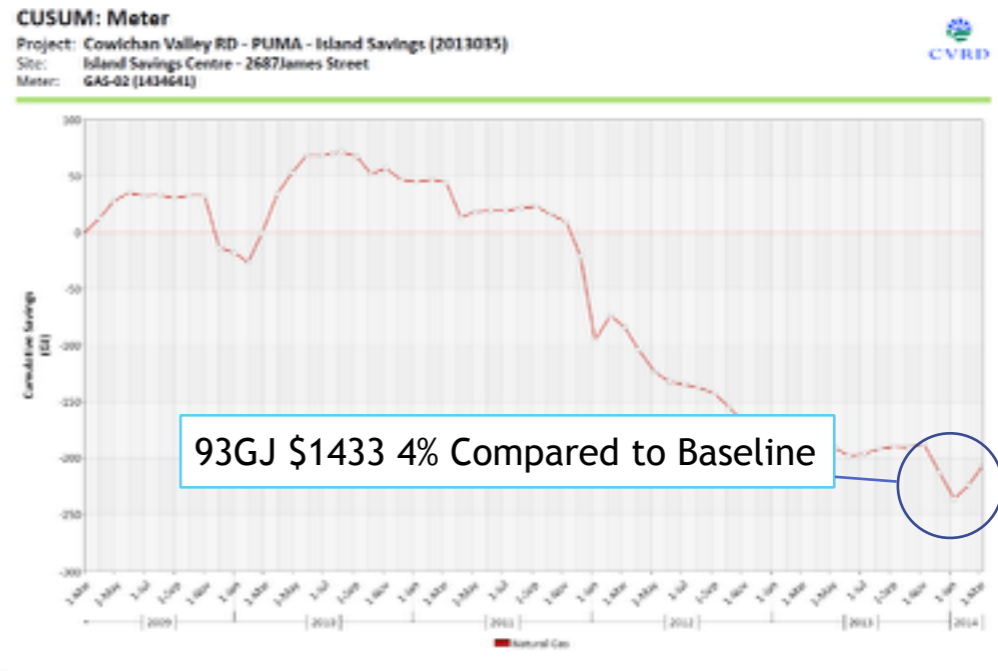
**Estimated electricity savings: 87'000 kWh in seven months period**



# Participant internal Reports: Island Savings Center, Duncan BC

## Gas Savings:

- \* No natural gas used to heat water for flooding
- \* 120USG x 8 times a day @ 140° F => 50° F
- \* 9 Months of the year.



## Electrical:

- \* Ice Temp raised 3° F (6% refrigeration savings/1° F)
- \* Stronger ice means less cleans
- \* Cold water means less heat load on compressors
- \* Cold water means less dehumidification
- \* Less hard water problem



**Gas savings:** Estimate 351GJ = \$4768  
**Electricity savings:** Estimated Savings \$6,573 (probably More?)

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