

THANK
YOU SSRIA



ALIGNING PLANNING AND CLIMATE RESILIENCE: EDMONTON INFILL LEARNINGS



This presentation will address and focus on
the existing residential sector



This presentation is about our transition
action plan to address the global 2030 and
2050 goals.

**20 MINUTE
PRESENTATION**

Introduce

Introduce MacPherson Engineering
and RadiantLink

Share

Share the Blanket of Warmth Project
and what was achieved

Create

Create a discussion about the
Canada Greener Homes Strategy

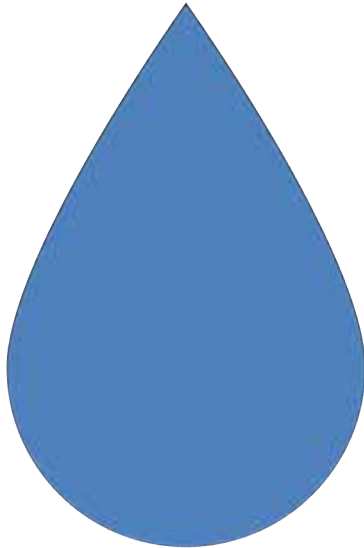


BACK STORY

ASHRAE

... TO SERVE HUMANITY BY ADVANCING THE ART AND
SCIENCE OF HEATING, VENTILATION, A/C AND
REFRIGERATION

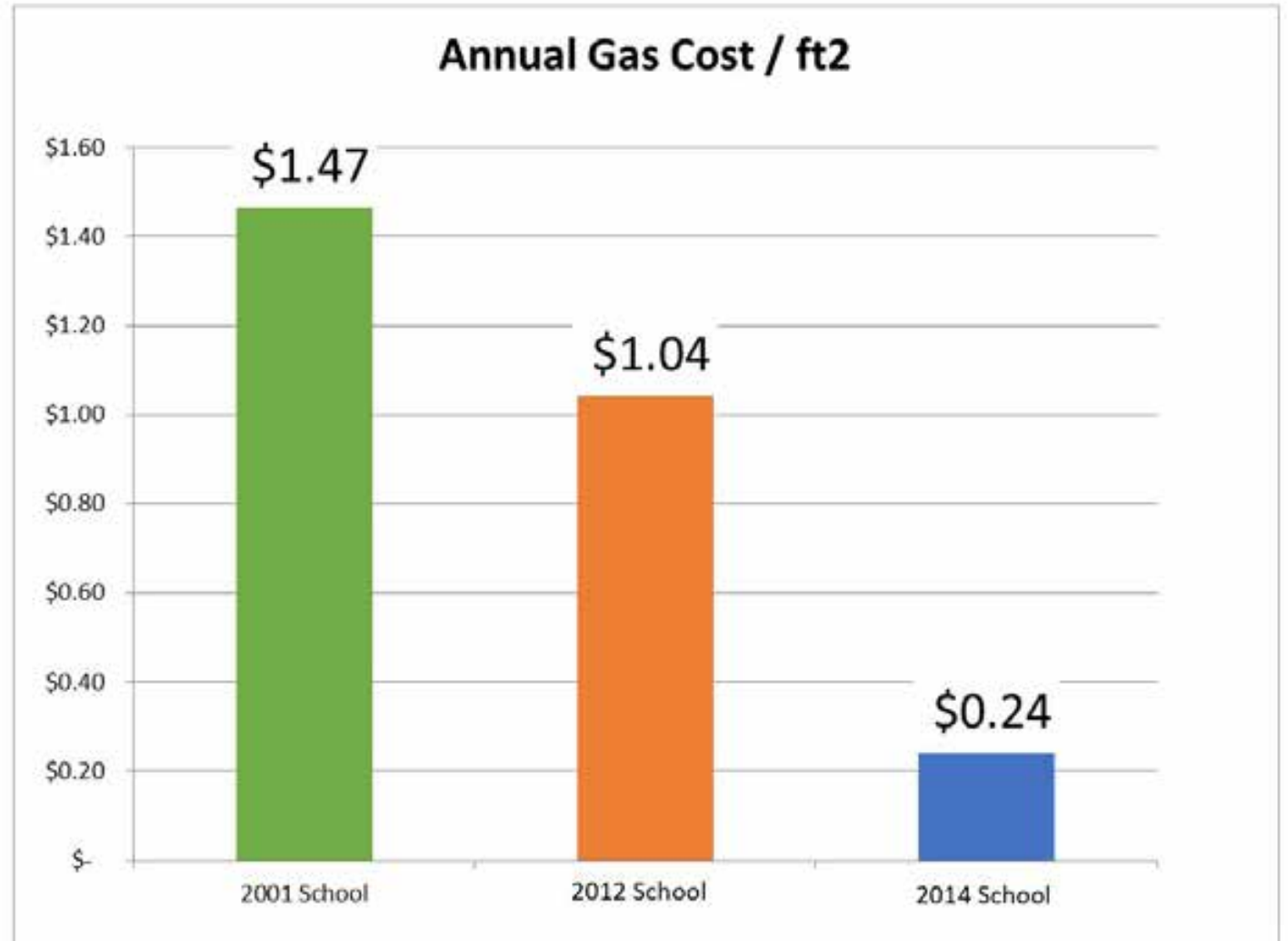
How we distribute heat and coolness matters.



- Example: to deliver 500,000 btu/hr energy:

Air	14 HP
Water	1.5 HP

BACK STORY





BUILDING DECARBONIZATION CONFERENCE OCT 5 - 7 2022

WHAT DID WE LEARN

- Electrifying with dirty electricity will increase our GHG emissions
- Whole Life Cycle = embodied + operational carbon
- Incoming President Ginger Scoggin's is asking that everyone turn down their thermostat by 1 degree in the winter and turn it up one degree in the summer



WHAT IS THERMAL MASS

**THE
BLANKET
OF
WARMTH
PROJECT
2019
STANDARD
55**



PROJECT: 'BLANKET OF WARMTH'

Could we address the 'wicked'
problem by shifting the
methodology?



FOUR PILLARS

Economy
Environment
Culture
Social Values





Back Story
Blanket of Warmth Project
StarBlanket Cree Nation

HVAC ART

RadiantLink connects the furnace to the floor for infloor heating and infloor cooling with the ability to grab passive cooling. This hybrid system is affordable and is a one day installation.





- HVAC ART
- CONTROL BOX
- Pump
- Gauge
- Expansion tank

WICKED PROBLEM COLD DAMP MUSTY SMELLING BASEMENTS THAT ARE ENERGY GUZZLERS

Select method: PMV method

Air temperature: 19 °C Use operative temperature

Mean radiant temperature: 19 °C

Air speed: 0.1 m/s No local air speed control

Humidity: 19 % Relative humidity

Metabolic rate: 1.2 met Standing, relaxed: 1.2

Clothing level: 0.74 clo Sweat pants, long-sleeve

Create custom ensemble

Dynamic predictive clothing

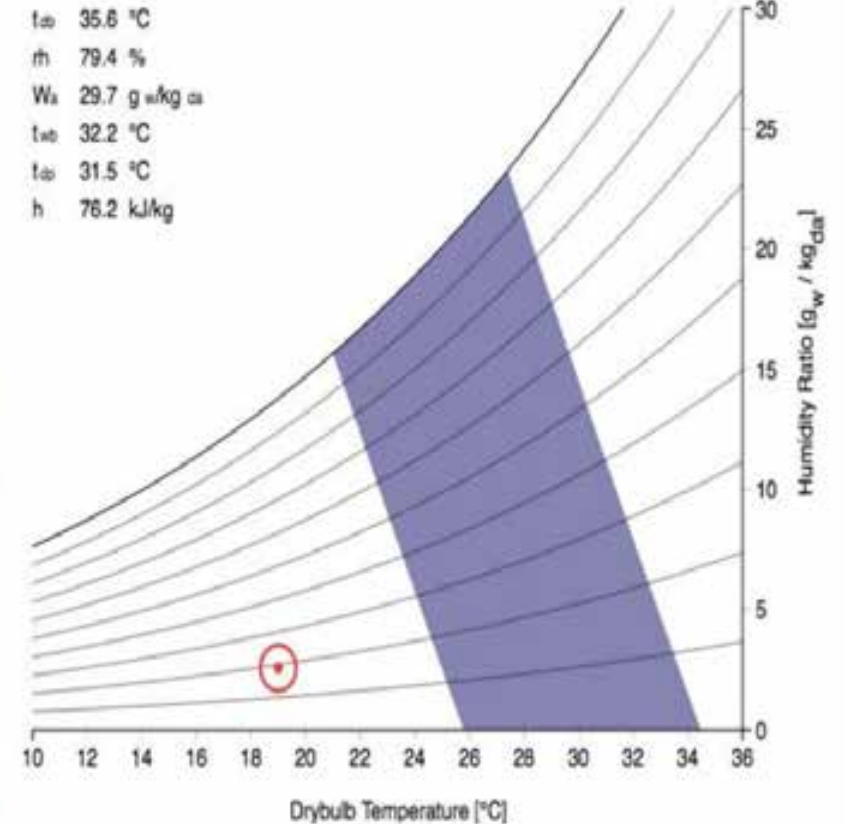
LEED documentation

Local discomfort SolarCal Specify pressure Global temp SI IP ? Help

✗ Does not comply with ASHRAE Standard 55-2017

PMV -1.21
PPD 36%
Sensation Slightly Cool
SET 20.9°C

Psychrometric chart (air temperature)



After we warmed the walls by 3 degrees the home met ASHRAE Standard 55



Hybrid System

Activation of the thermal mass in the basement concrete walls, resulting in ASHRAE 55 compliance.

ENERGY REDUCTION COMFORT AND SAFETY

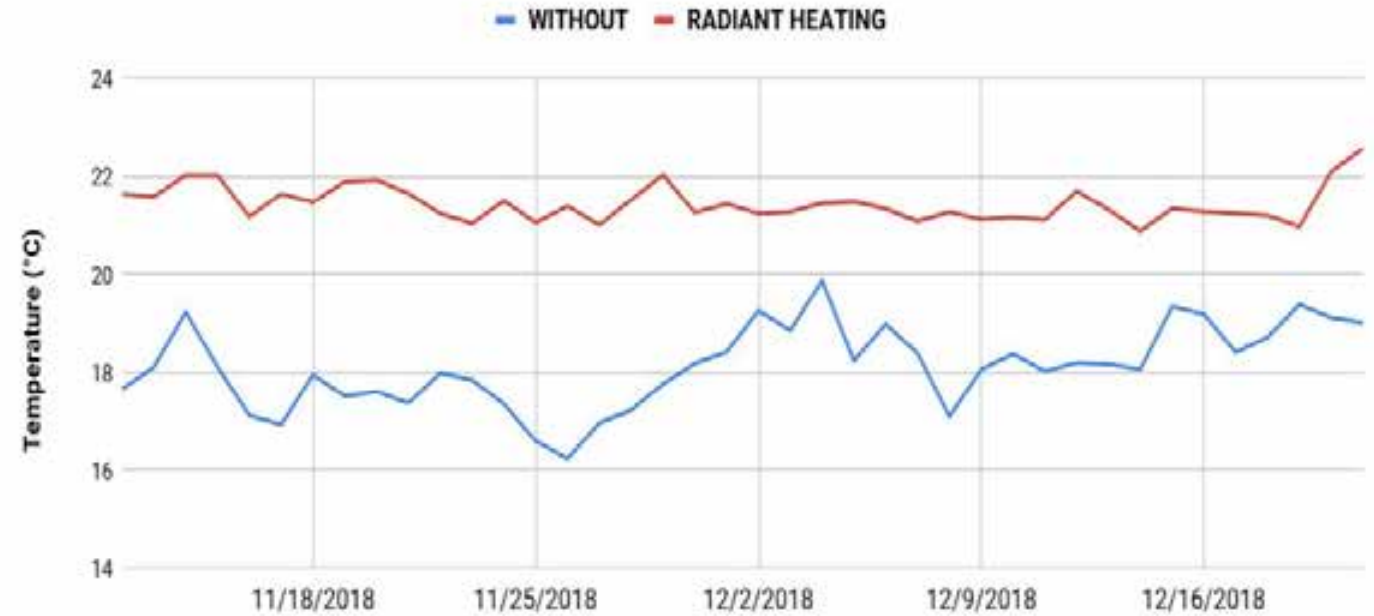


Figure 10: Average Middle of Room Temperature Comparison November 12 to December 21

WHAT DID WE ACHIEVE

- Home comply with ASHRAE Standard 55 - comfort
- We reduced the energy consumption of the home by \$900 a year
- By activating the thermal mass of the building, we built in 12.9 hours of residual heat during a power outage - creating adaptation and resiliency
- By redesigning the HVAC system, we reduced the risk of dying in the fire.
- Addressed indoor air quality - activation of the thermal mass keeps the walls dry and at consistent temperature.



**THE
BLANKET OF
WARMTH
HAS
RECEIVED
THREE
AWARDS**

- 2021 APEGS Exceptional Engineering Award
- <https://www.youtube.com/watch?v=vEvyPfJhZIA>
- 2021 SABMag Canadian Green Building Award - technical award.
- United Nations – Regional Center of Expertise on Education for Sustainable Development

CANADA GREENER HOMES GRANT

HEAT PUMPS

The Canada Greener Homes Grant has funds available for homeowners to install heat pumps



94% of Alberta's homes use a natural gas furnace



Shifting the Distribution of the energy in the home -
Can we do more with less

SETTING COMMUNITIES UP FOR SUCCESS



ALIGNING PLANNING AND CLIMATE RESILIENCE: EDMONTON INFILL LEARNINGS



- On November 9, 2022 the Regina Chapter will be hosting a panel presentation and we have invited the universities, the polytechs, cities, the province, Sask Energy and SaskPower with the goal to build a common communication strategy to promote waste reduction and turning down our thermostats by one degree.
- We are working with Correction Canada and have installed two units that activate the thermal mass of the building in two tiny homes.

NEXT STEPS

**WORKING TOGETHER CREATES
COMPASSIONATE PROFESSIONALISM
AND SOCIAL SUSTAINABILITY.**

