St Hilda’s Energy Plans

REDUCING CONSUMPTION, REDUCING EMISSIONS, REDUCING COSTS.

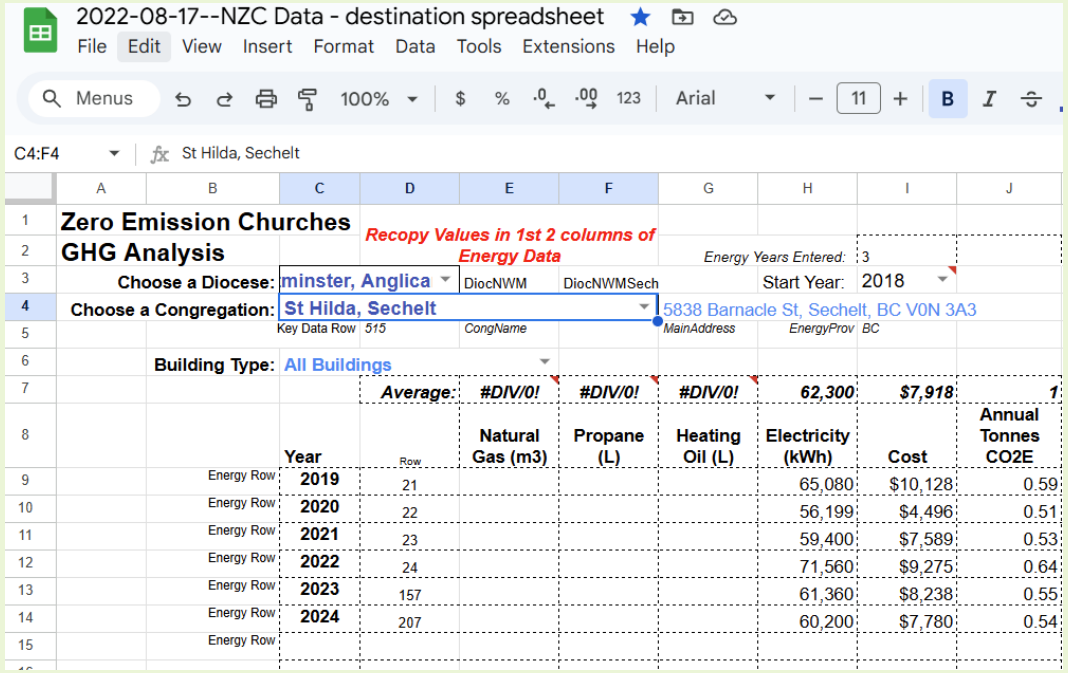
Our road map:

1. Assess our facilities and energy use, emissions and costs to help:
   i. identify priorities
   ii. see the impact
2. Lighting
   i. Conversion to LED
3. Heating and Cooling
   i. Insulation
   ii. Heat Pumps
4. Sourcing and securing our energy
   i. Generation: Solar Panels
   ii. Storage: Batteries

Assessment

1. Zero Emission Churches (https://zeroemissionchurches.ca/)
   - a protocol, database and help to move parishes to zero greenhouse gas emissions
   - completed for two parishes in the Diocese of New Westminster:

St Hilda's



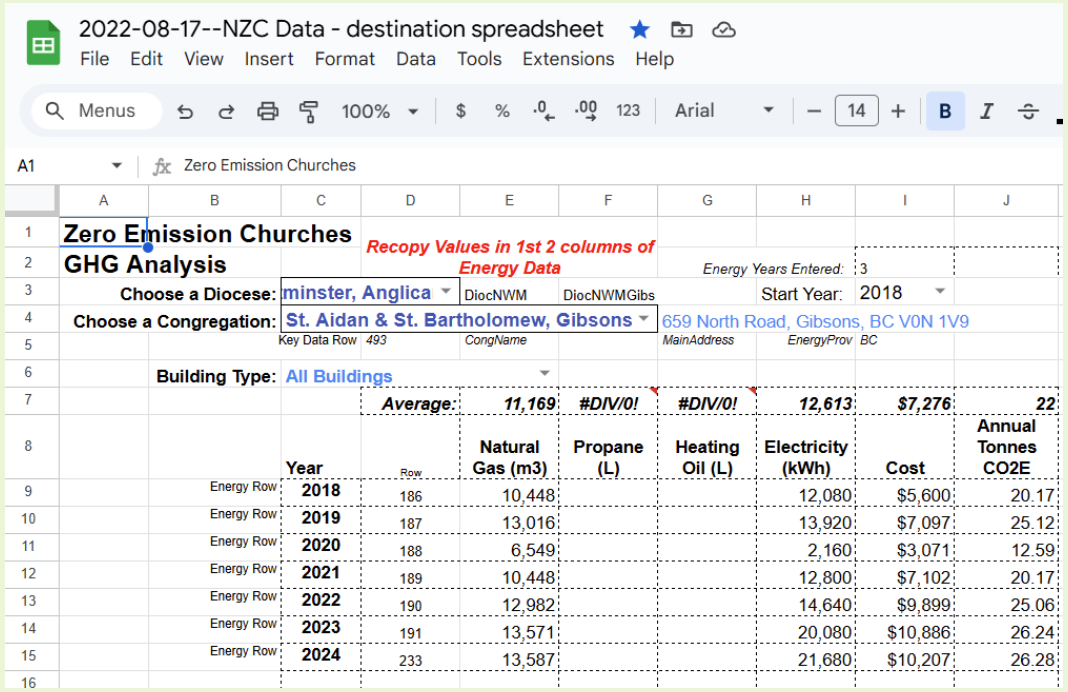
2022-08-17--NZC Data - destination spreadsheet

File Edit View Insert Format Data Tools Extensions Help

C4:F4 | St Hilda, Sechelt

	A	B	C	D	E	F	G	H	I	J
1	**Zero Emission Churches**			*Recopy Values in 1st 2 columns of Energy Data*			*Energy Years Entered:*	3		
2	**GHG Analysis**									
3		**Choose a Diocese:**	minster, Anglica	DiocNWM	DiocNWMSech		Start Year:	2018		
4		**Choose a Congregation:**	St Hilda, Sechelt			5838 Barnacle St, Sechelt, BC V0N 3A3				
5			Key Data Row 515	CongName		MainAddress	EnergyProv	BC		
6		**Building Type:**	All Buildings							
7				*Average:*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*62,300*	*$7,918*	*1*
8			**Year**	Row	**Natural Gas (m3)**	**Propane (L)**	**Heating Oil (L)**	**Electricity (kWh)**	**Cost**	**Annual Tonnes CO2E**
9		Energy Row	**2019**	21				65,080	$10,128	0.59
10		Energy Row	**2020**	22				56,199	$4,496	0.51
11		Energy Row	**2021**	23				59,400	$7,589	0.53
12		Energy Row	**2022**	24				71,560	$9,275	0.64
13		Energy Row	**2023**	157				61,360	$8,238	0.55
14		Energy Row	**2024**	207				60,200	$7,780	0.54
15		Energy Row								

St Bart's



2022-08-17--NZC Data - destination spreadsheet

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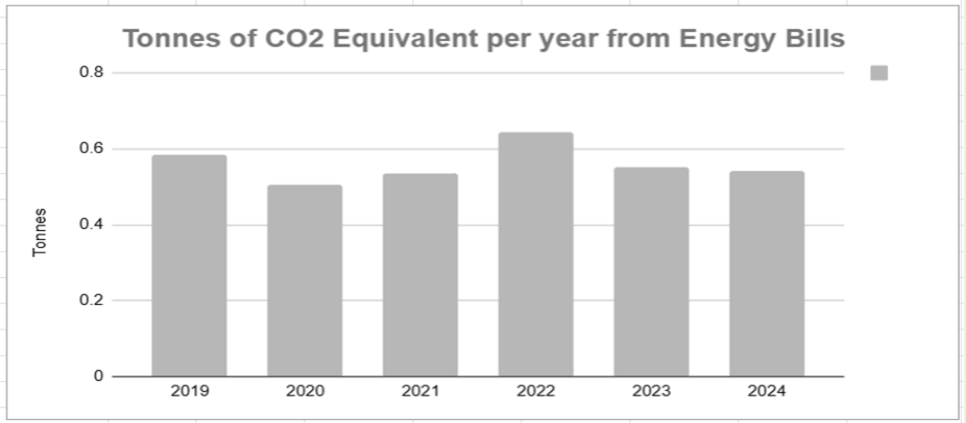
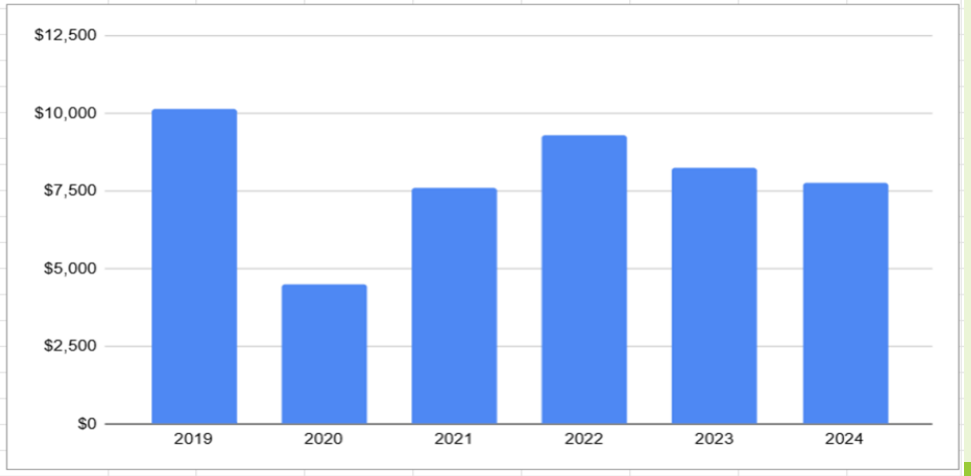
A1 | Zero Emission Churches

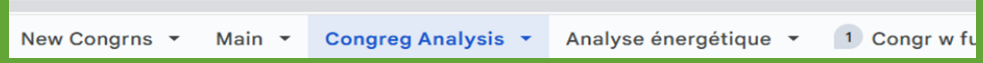
	A	B	C	D	E	F	G	H	I	J
1	**Zero Emission Churches**			*Recopy Values in 1st 2 columns of Energy Data*			*Energy Years Entered:*	3		
2	**GHG Analysis**									
3		**Choose a Diocese:**	minster, Anglica	DiocNWM	DiocNWMGibs		Start Year:	2018		
4		**Choose a Congregation:**	St. Aidan & St. Bartholomew, Gibsons			659 North Road, Gibsons, BC V0N 1V9				
5			Key Data Row 493	CongName		MainAddress	EnergyProv	BC		
6		**Building Type:**	All Buildings							
7				*Average:*	*11,169*	*#DIV/0!*	*#DIV/0!*	*12,613*	*$7,276*	*22*
8			**Year**	Row	**Natural Gas (m3)**	**Propane (L)**	**Heating Oil (L)**	**Electricity (kWh)**	**Cost**	**Annual Tonnes CO2E**
9		Energy Row	**2018**	186	10,448			12,080	$5,600	20.17
10		Energy Row	**2019**	187	13,016			13,920	$7,097	25.12
11		Energy Row	**2020**	188	6,549			2,160	$3,071	12.59
12		Energy Row	**2021**	189	10,448			12,800	$7,102	20.17
13		Energy Row	**2022**	190	12,982			14,640	$9,899	25.06
14		Energy Row	**2023**	191	13,571			20,080	$10,886	26.24
15		Energy Row	**2024**	233	13,587			21,680	$10,207	26.28
16										

Assessment: Greenhouse gas emissions

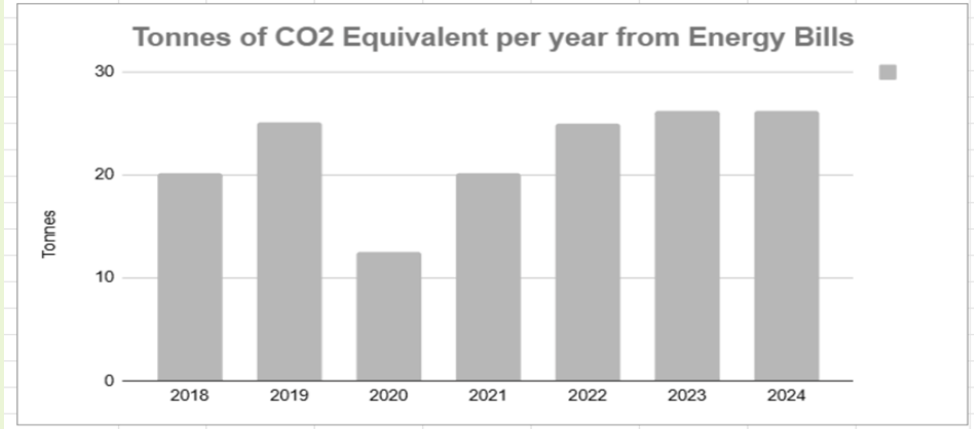
St Hilda's

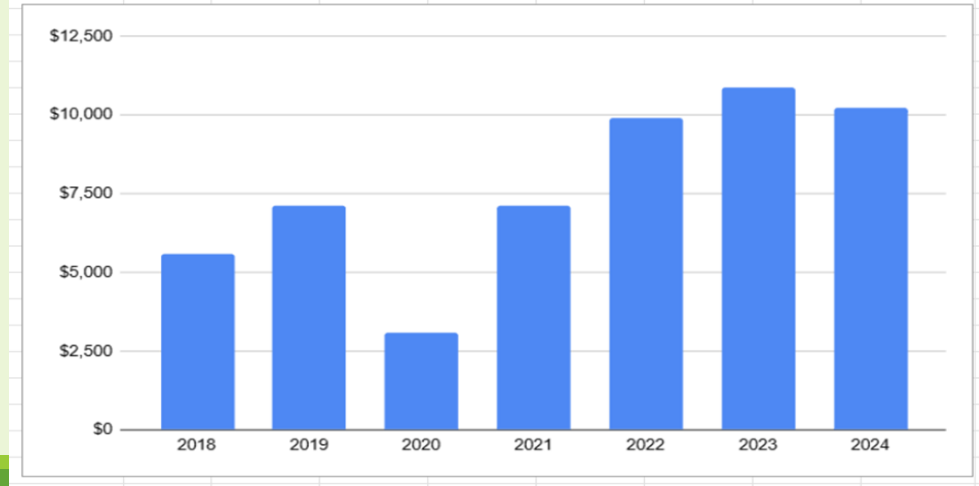


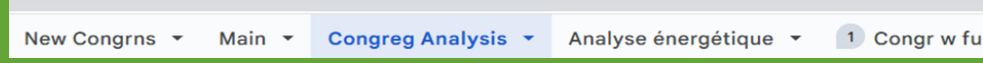




St Bart's

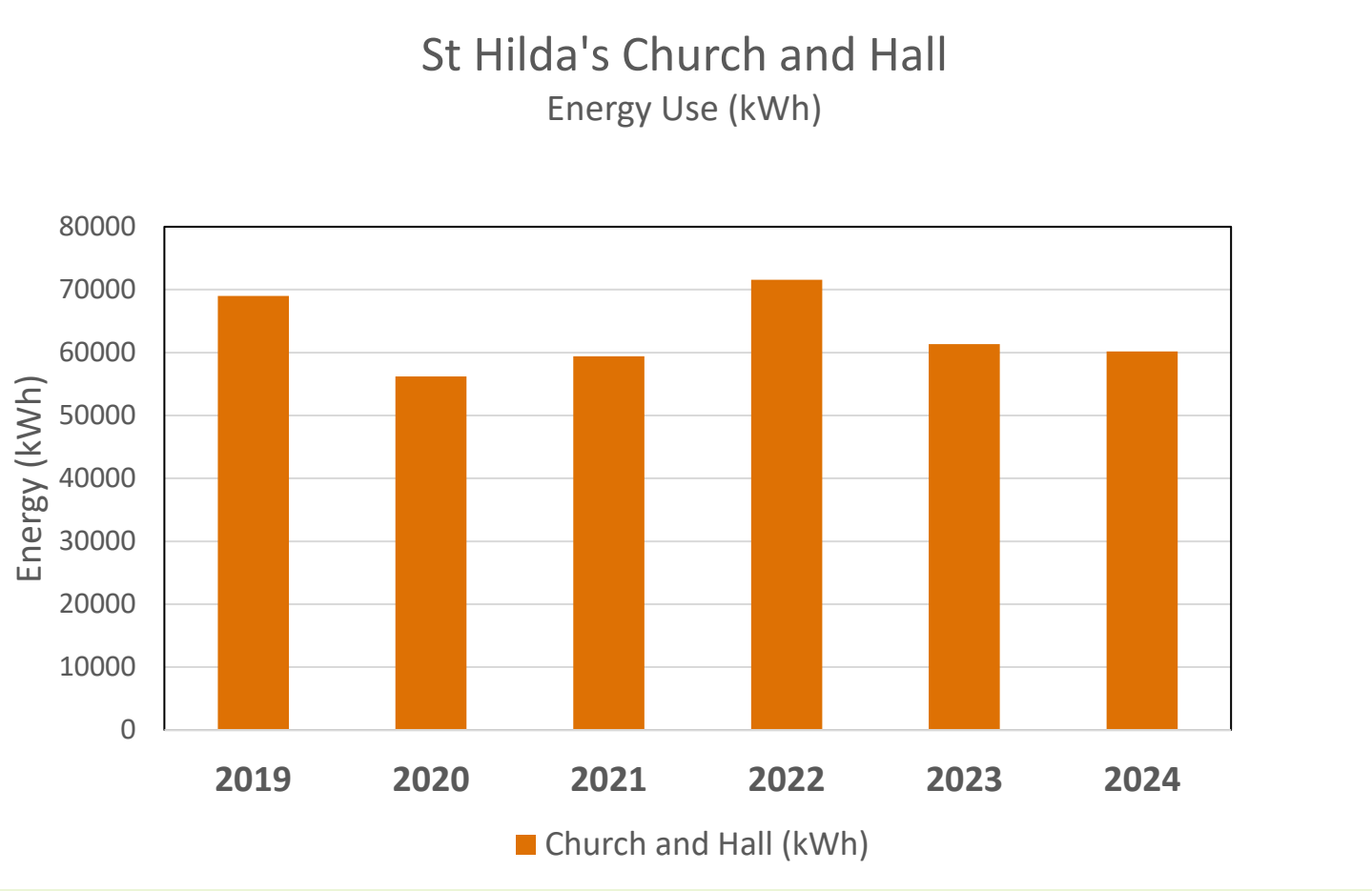






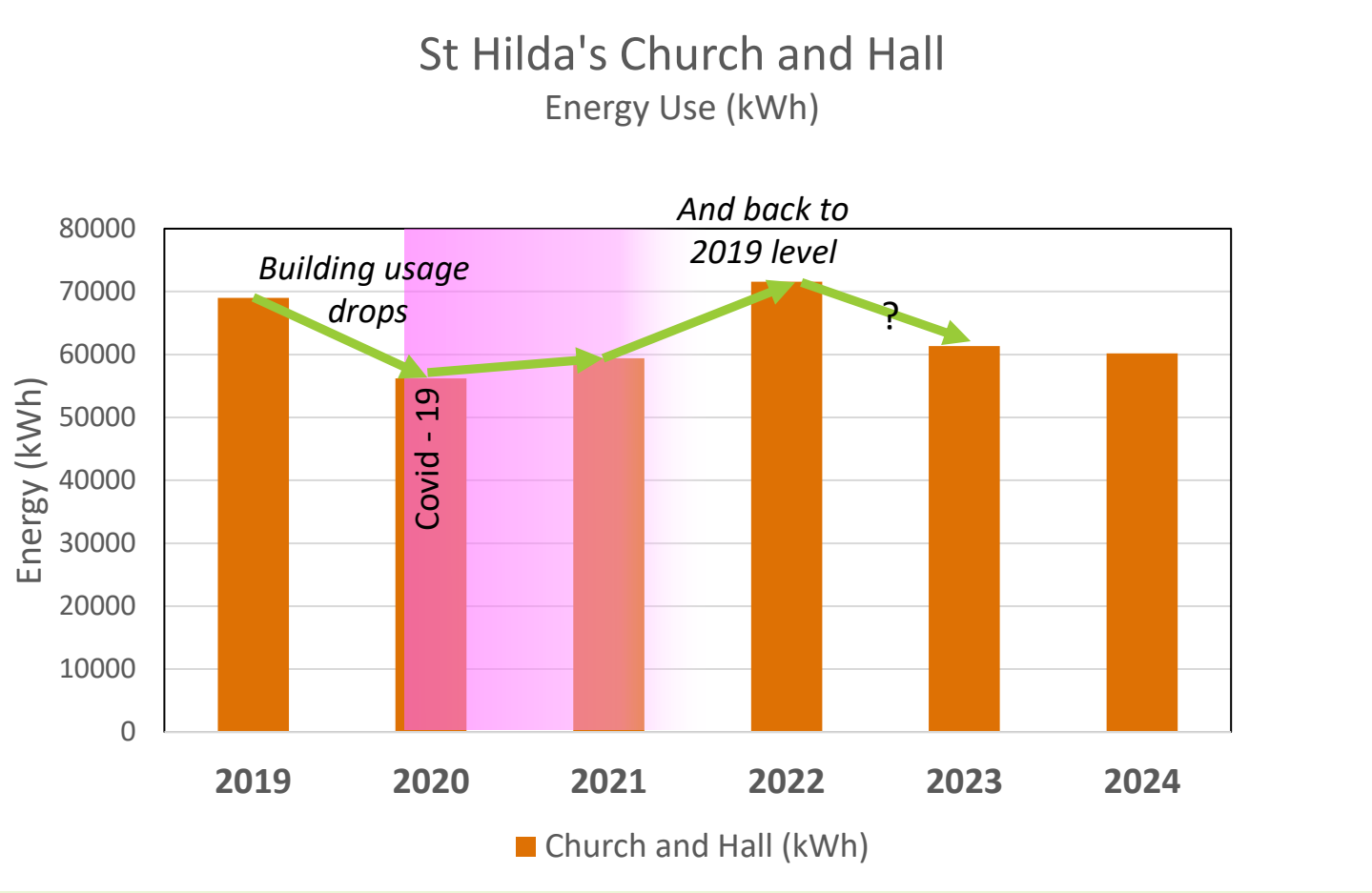
Assessment: St Hilda’s Energy Use

What might explain the year-to-year changes in energy use?



Assessment: The COVID effect

Energy use drops in 2020 and 2021 when COVID protection measures cause building use to drop and so our buildings do not need to be kept as warm as in 2019.

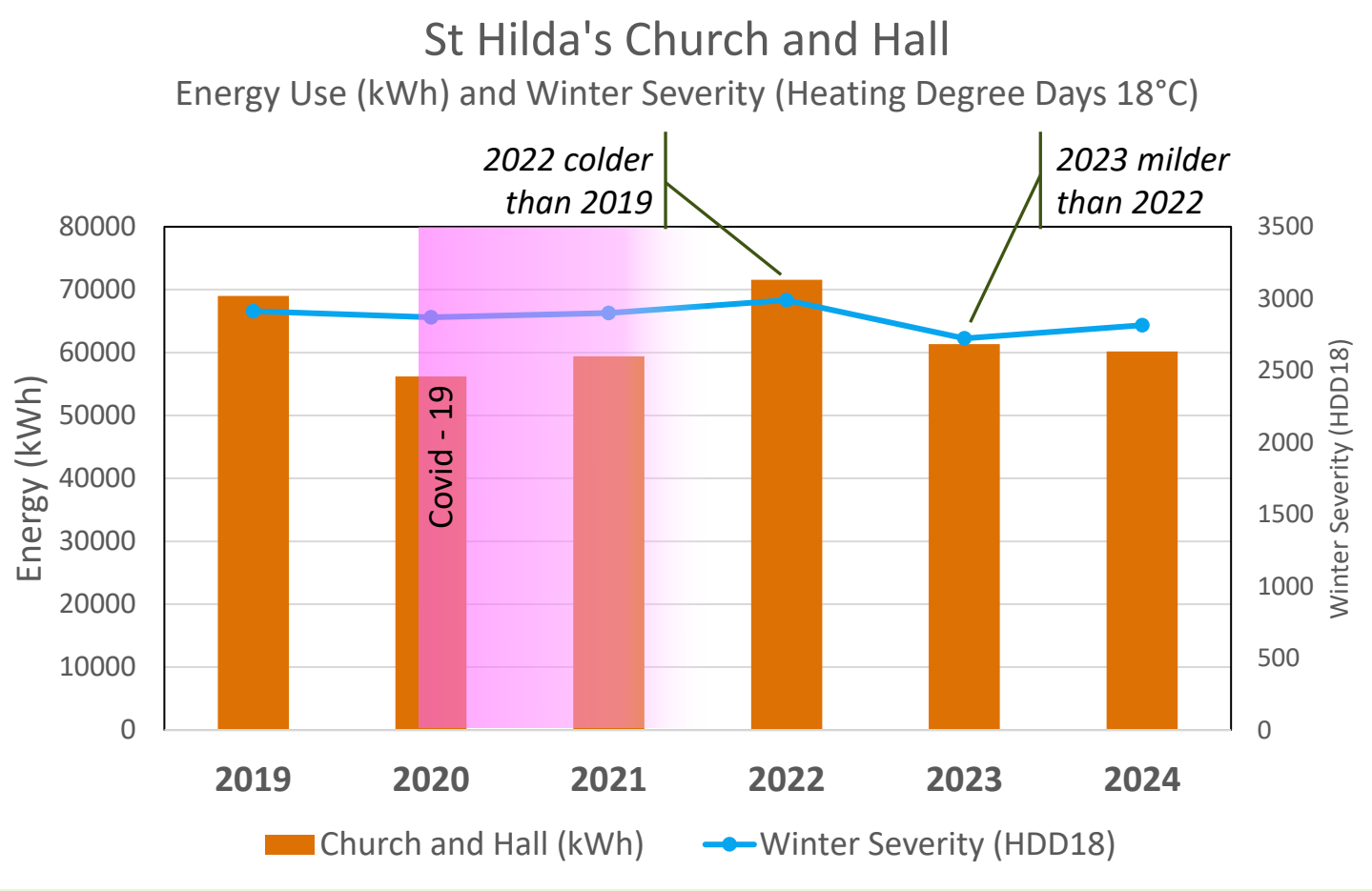


By 2022 the buildings are in full use again and energy use is back up around the 2019 level.

What's going on in 2023?

Assessment: Temperature Effect

The blue line is a measure of coldness during the heating season. It shows that 2023 is less cold (warmer) than 2022, so energy use is lower in 2023 than in 2022



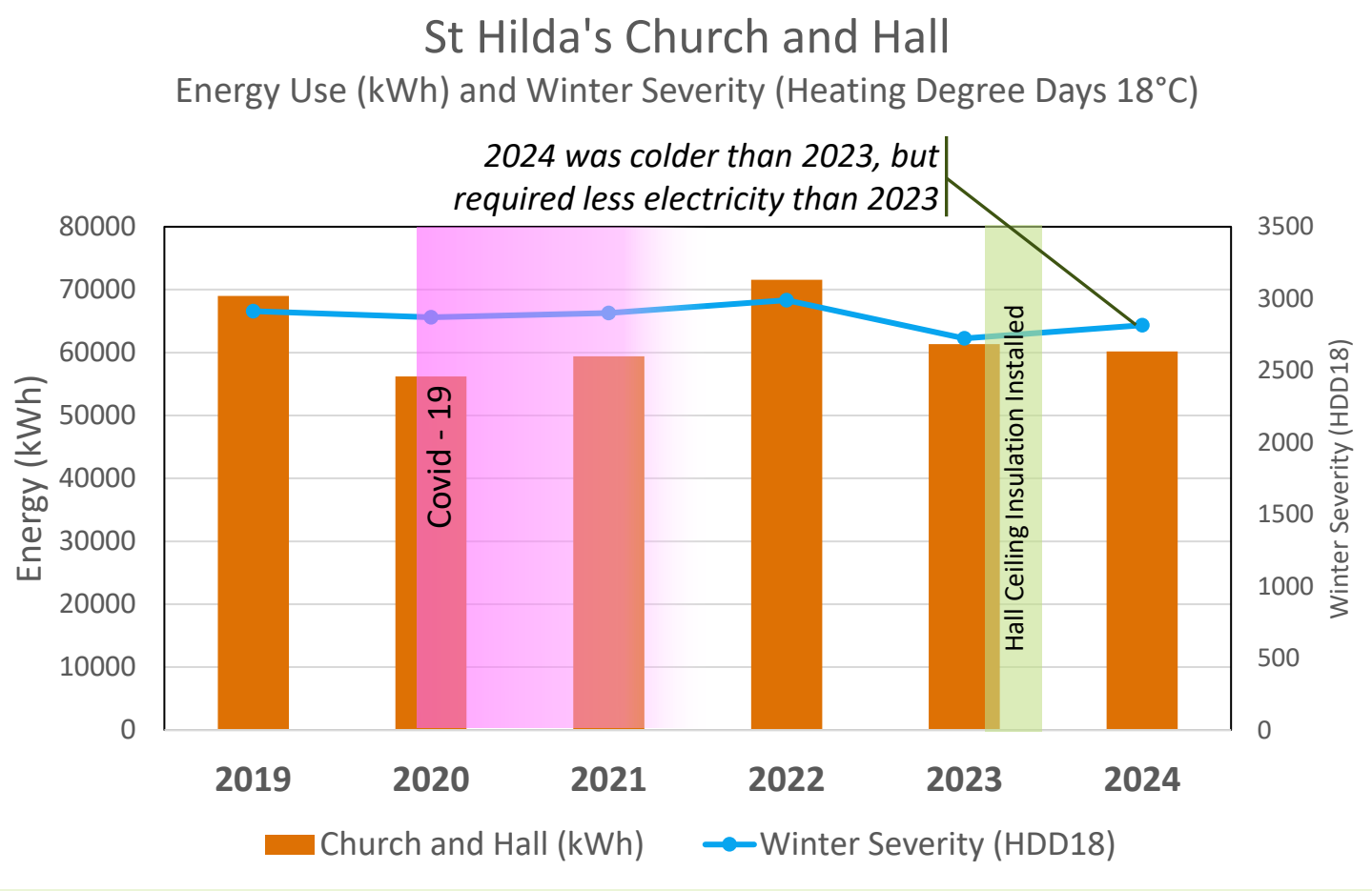
2024 is colder than 2023, and so energy use is down from 2023.

What's going on in 2024?

Assessment: Insulation Effect?

By late 2023 we had insulated the floor and ceiling of the Parish Hall, which may explain slightly lower energy use, despite colder heating seasons.

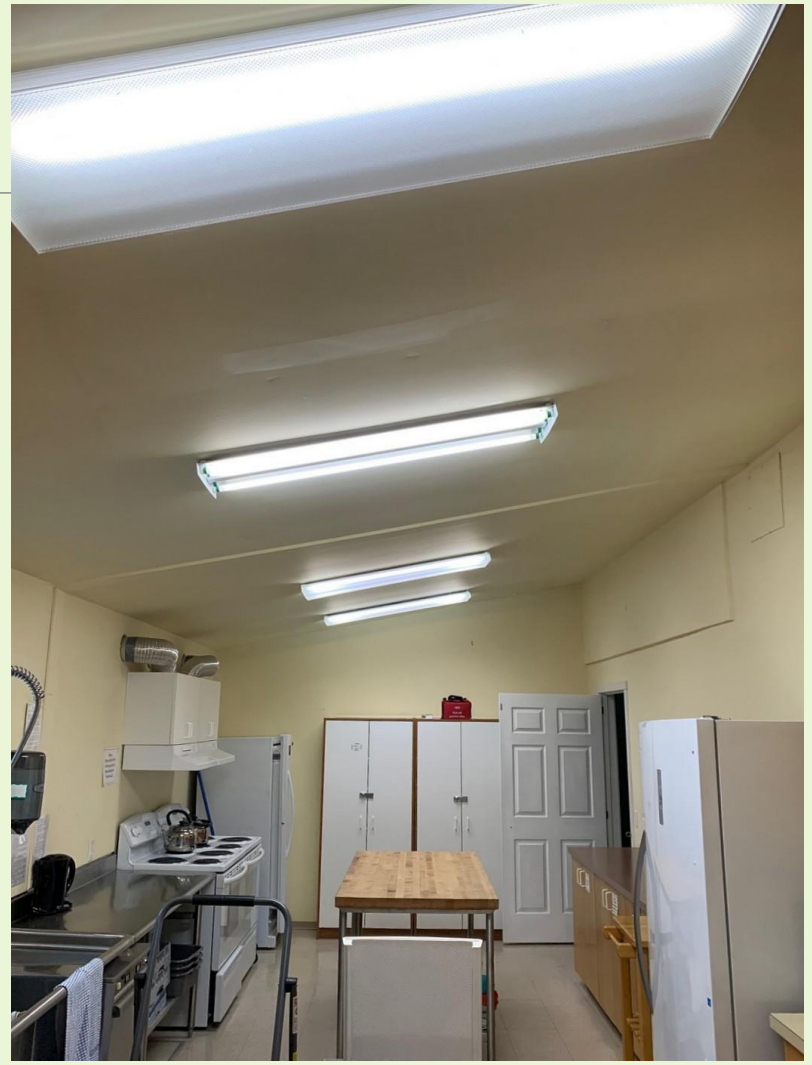
We hope so.



Stay tuned for 2025 data.

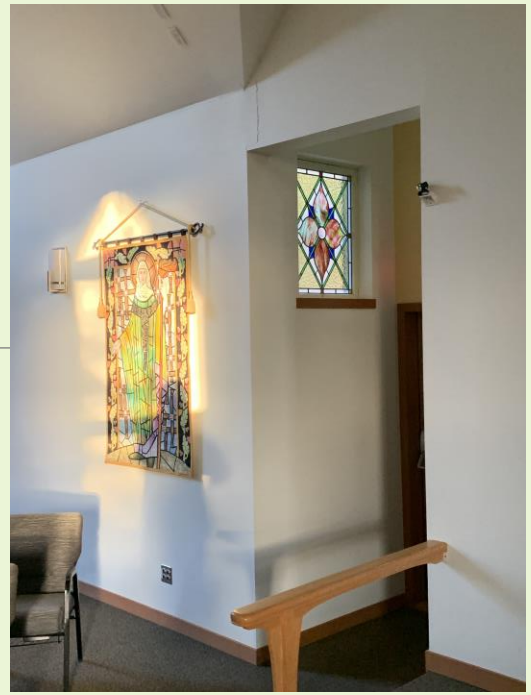
Lighting

- Conversion to LED lighting
  - Almost complete:
    - Gathering Room and Offices switched over last year
    - Kitchen lighting remains to be done
  - we are working with a BC Hydro Energy Coach to find subsidies and grants for the change over to LEDs



Heating and Cooling

- Insulation
  - Stained Glass Windows – installed double-glazed insulating glass with help from a Diocesan Climate Fund



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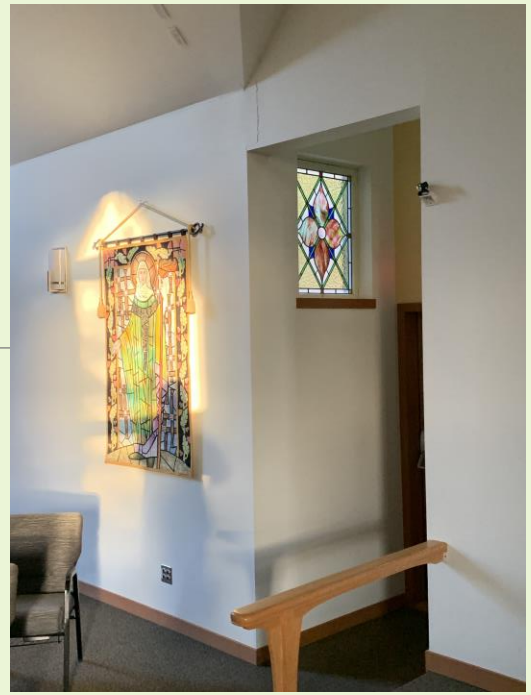

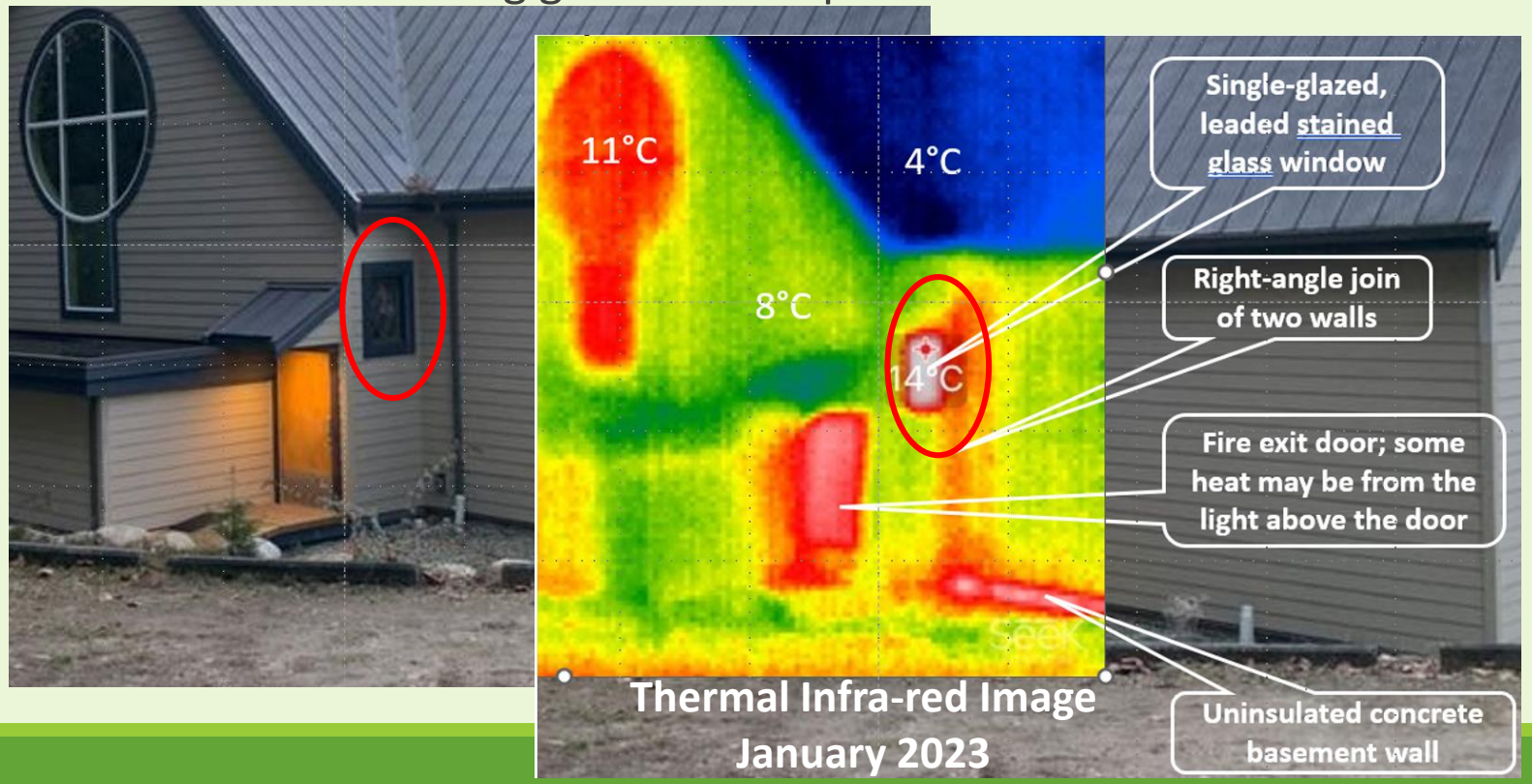

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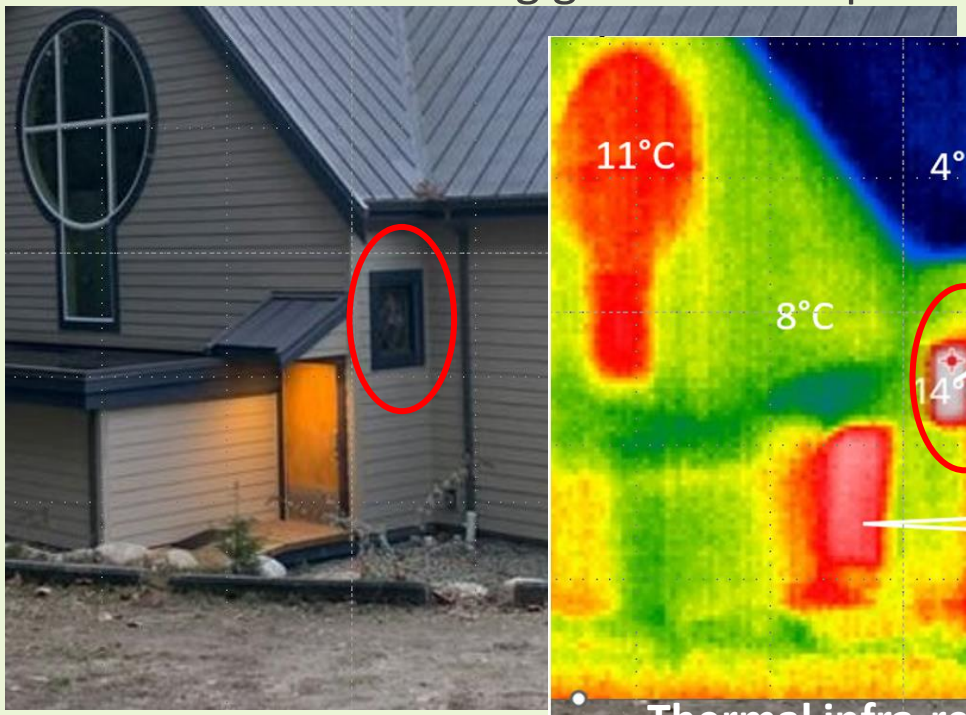
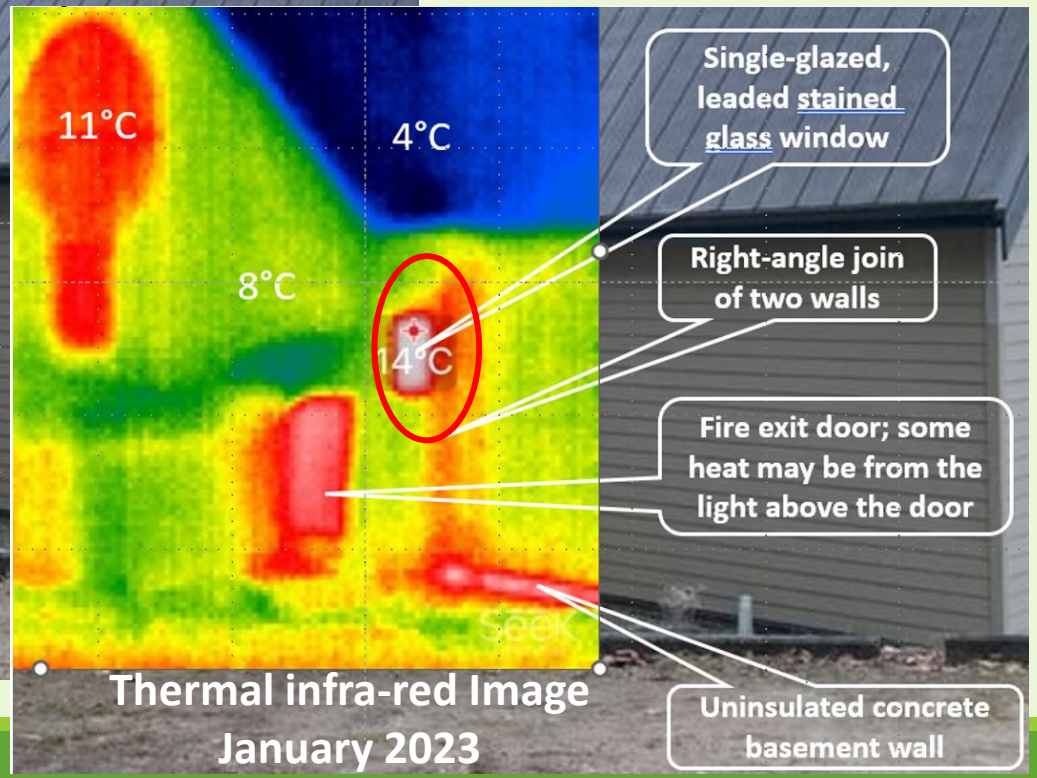
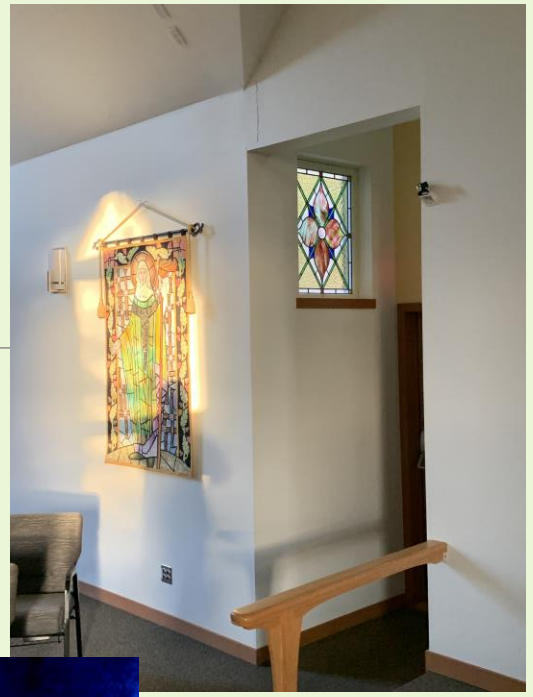
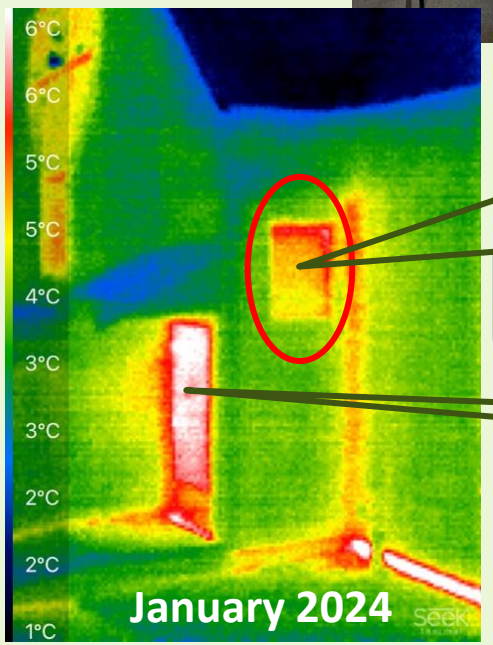








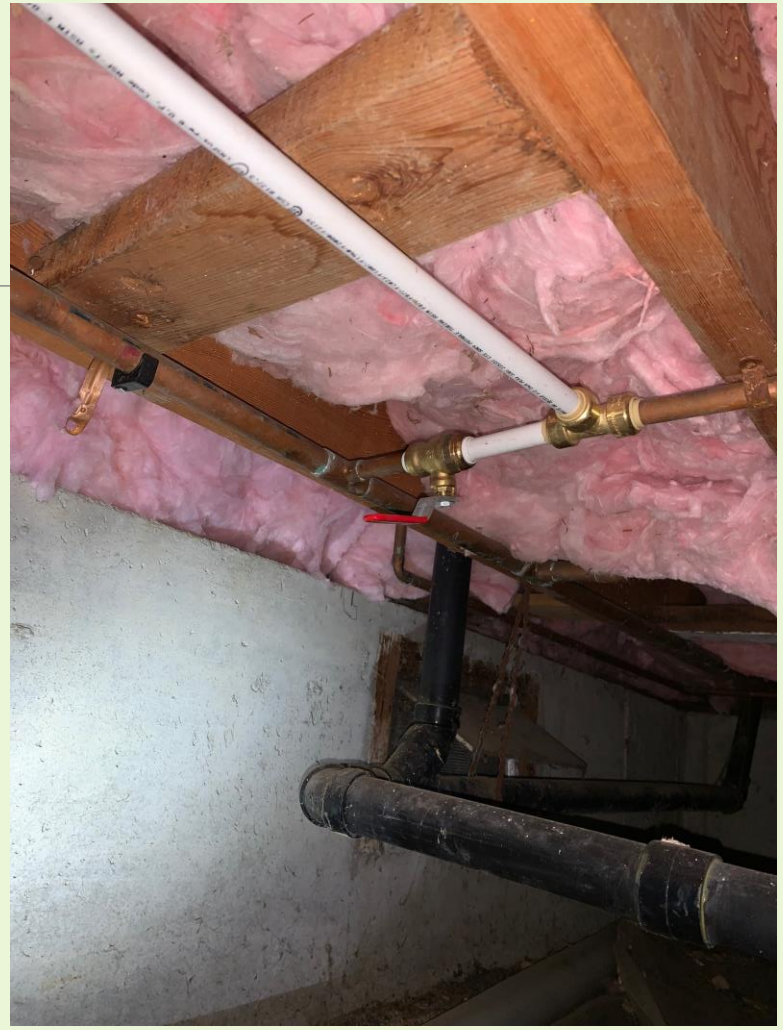
In 2024, after double-glazing, the window is cooler…

…than the door

Heating and Cooling

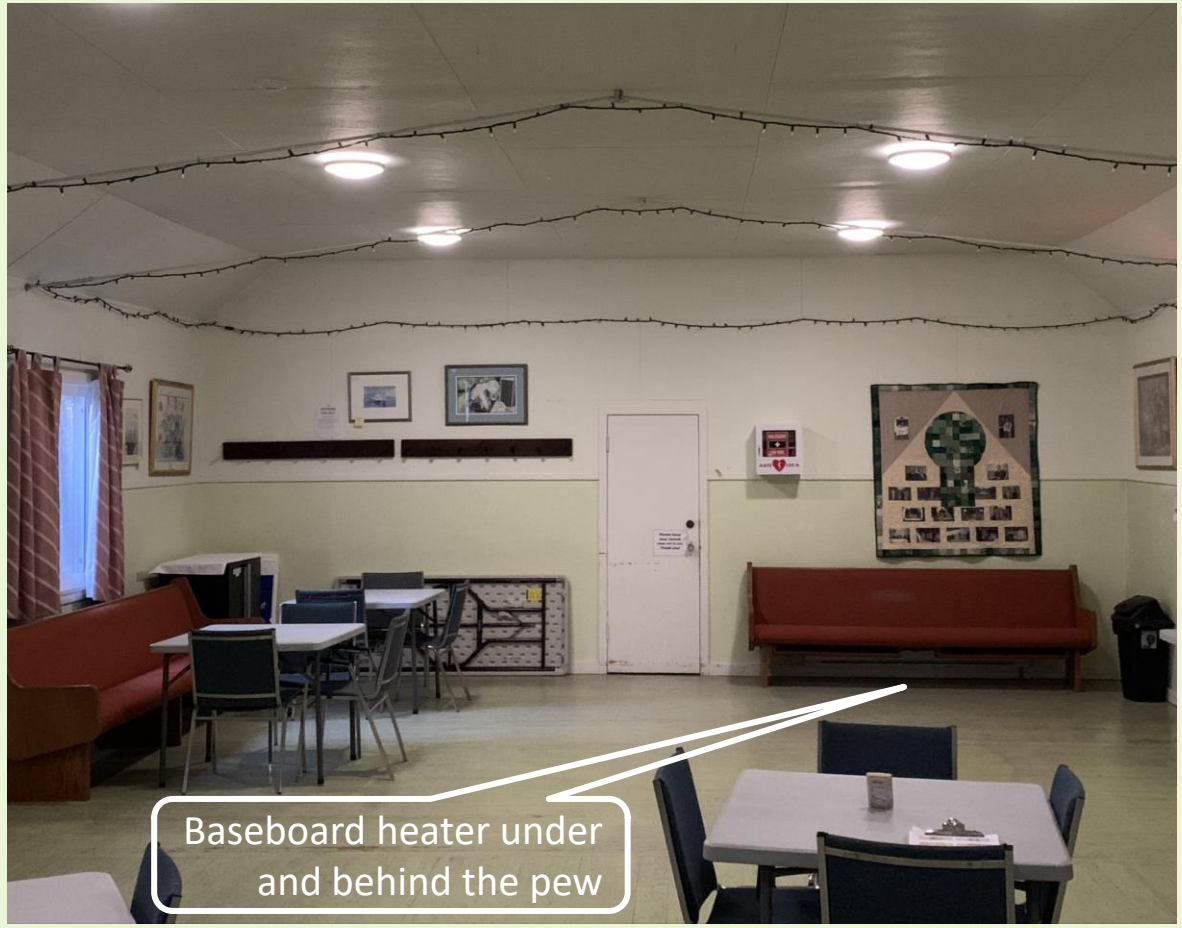
- Insulation
  - Installed insulation under the floor of the Hall
    - fall of 2022
  - Installed insulation in ceiling of the Hall with help from a federal New Horizons grant
    - fall of 2023

- Smart thermostats turn down heat when not required
  - Installed in the Hall in fall of 2023
  - Investigating other spaces and, with BC Hydro, the possibility of grants or subsidies.



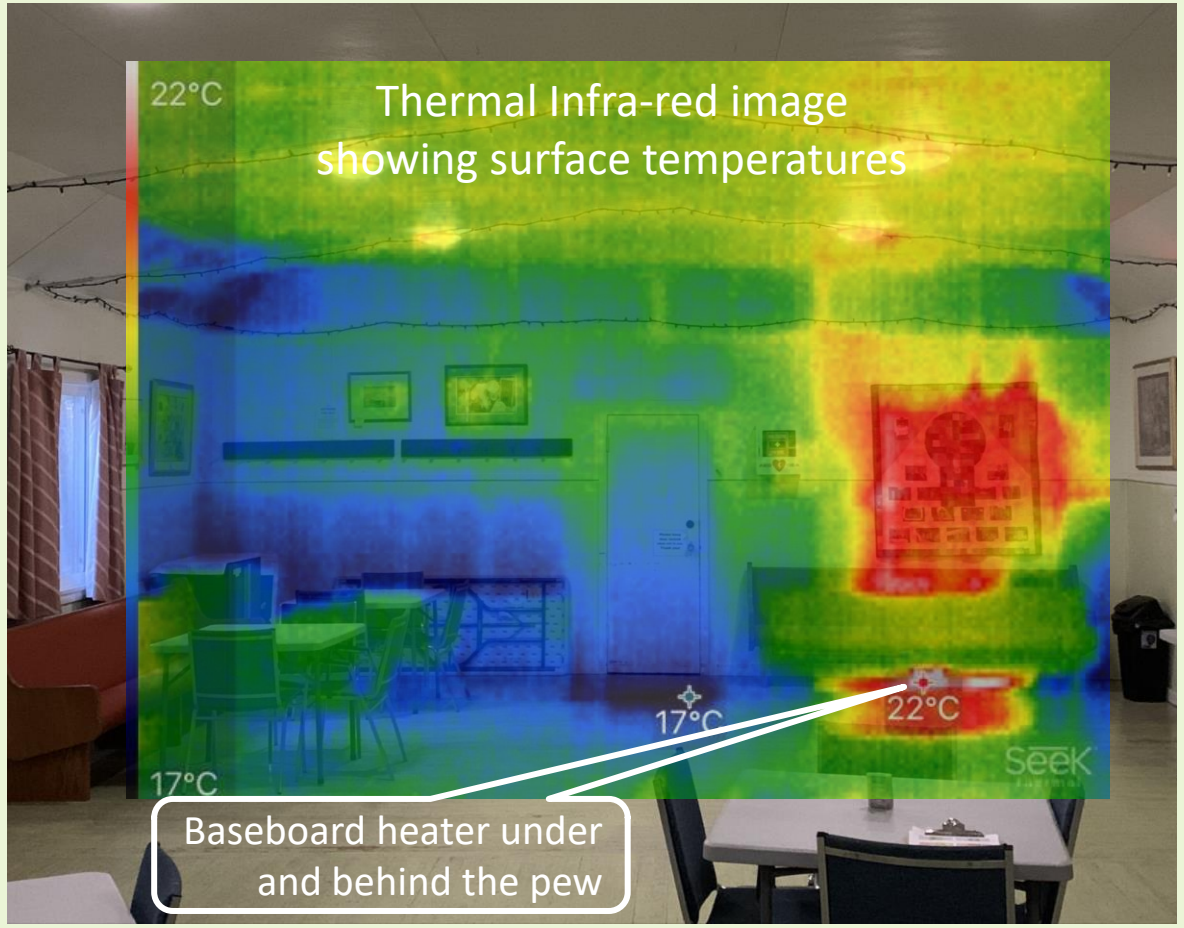
Heating and Cooling

- Heat Pumps
  - heat pumps are more efficient than baseboard heaters, since they use electricity to extract heat from air rather than simply using electricity to generate heat.
  - Heat pumps can also serve as air conditioners.
  - Our space could be refuge in a heat dome.



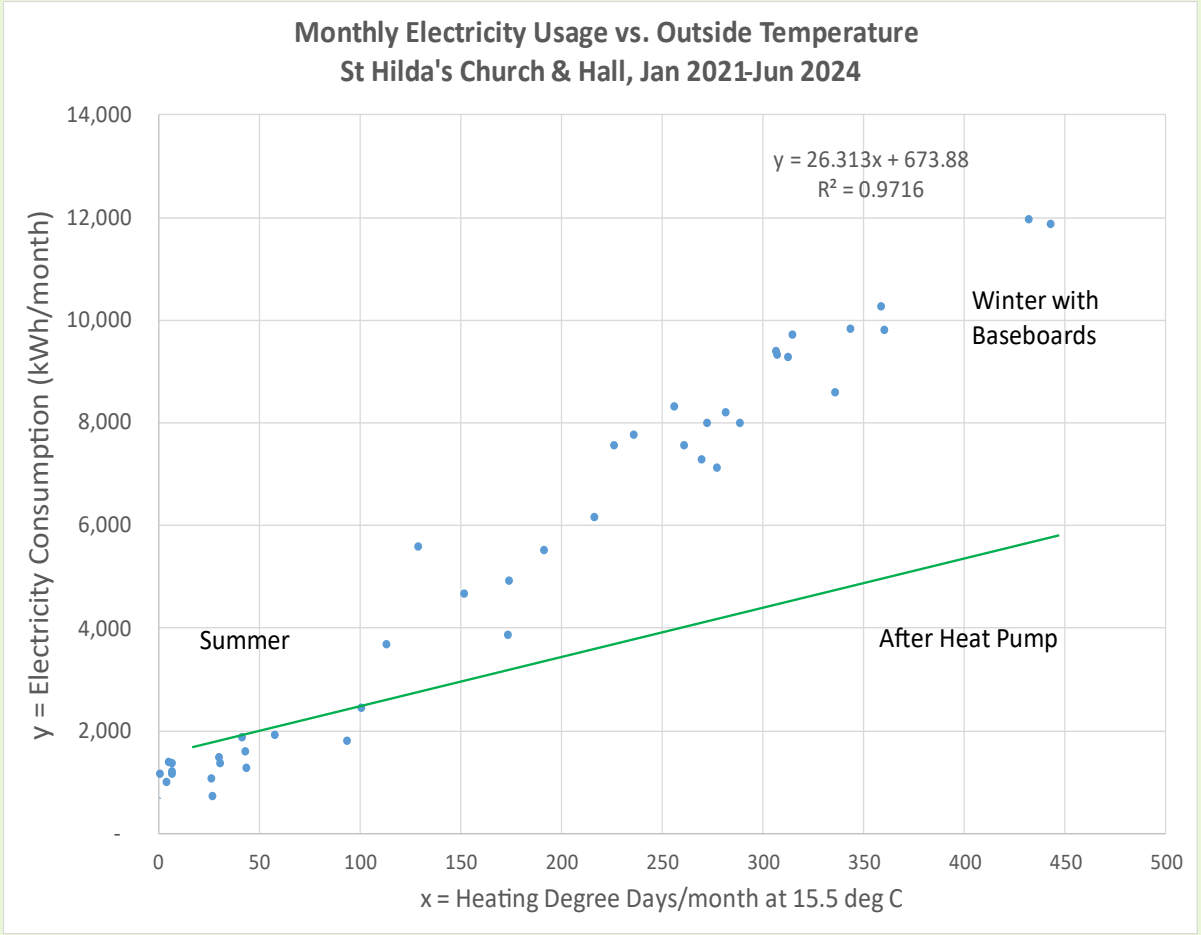
Heating and Cooling

- Heat Pumps
  - St Hilda's has submitted a grant proposal to the federal New Horizons program for a heat pump for the Hall; the budget is for $20,000. (Thanks Janet McIntosh and Mike Starr)



Heating and Cooling

- Heat Pumps
  - Church and Hall estimate of savings using Heat Pumps over current electricity costs: >$4,000/year[1]
  - Baseboard heaters will remain as backup heating source
  - We are in the process of getting cost estimates for heat pump for the offices, the Gathering Room and the Nave.



[1] Thanks to Gerry Pageau of the Sunshine Coast Community Solar Association for this analysis

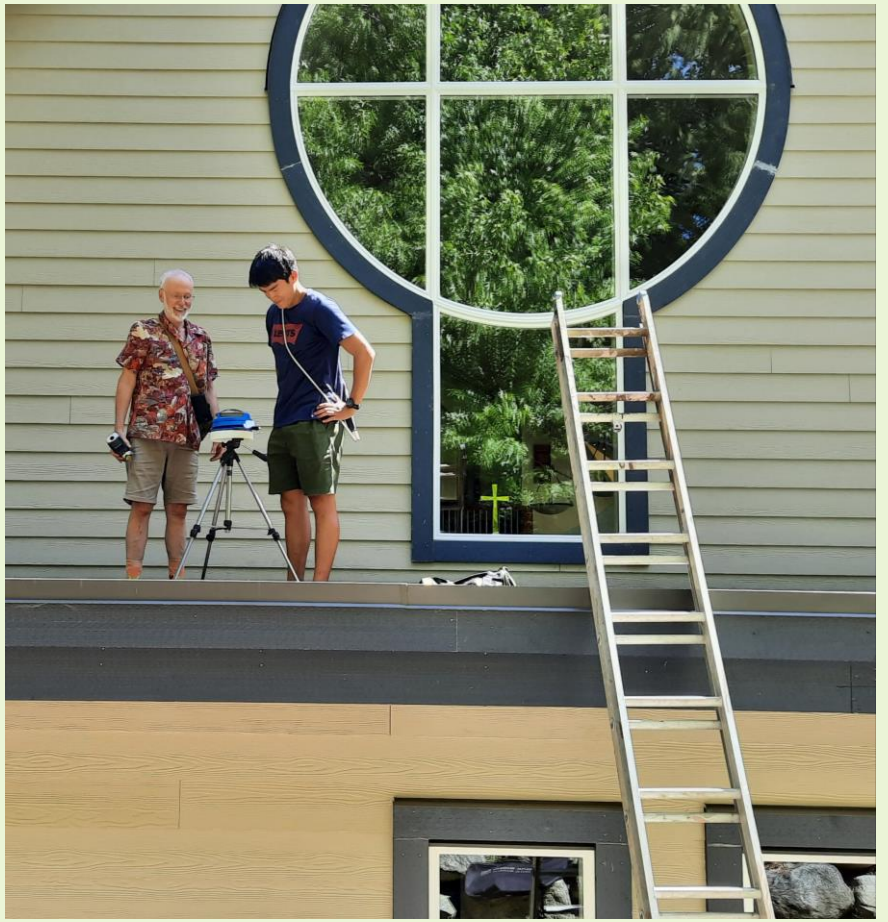
Sourcing and securing our energy

Solar Panels – converting solar energy to electricity

- The Sunshine Coast Community Solar Association (https://www.suncoastsolar.org/) completed a solar energy feasibility assessment for us last summer, **free-of-charge**

  Thanks Gerry Pageau and Yutaro Kanda

- Solar Panels would allow us to generate electricity for our own use and trade surplus electricity to BC Hydro in the summer for credit to use when we need power from them in the winter.



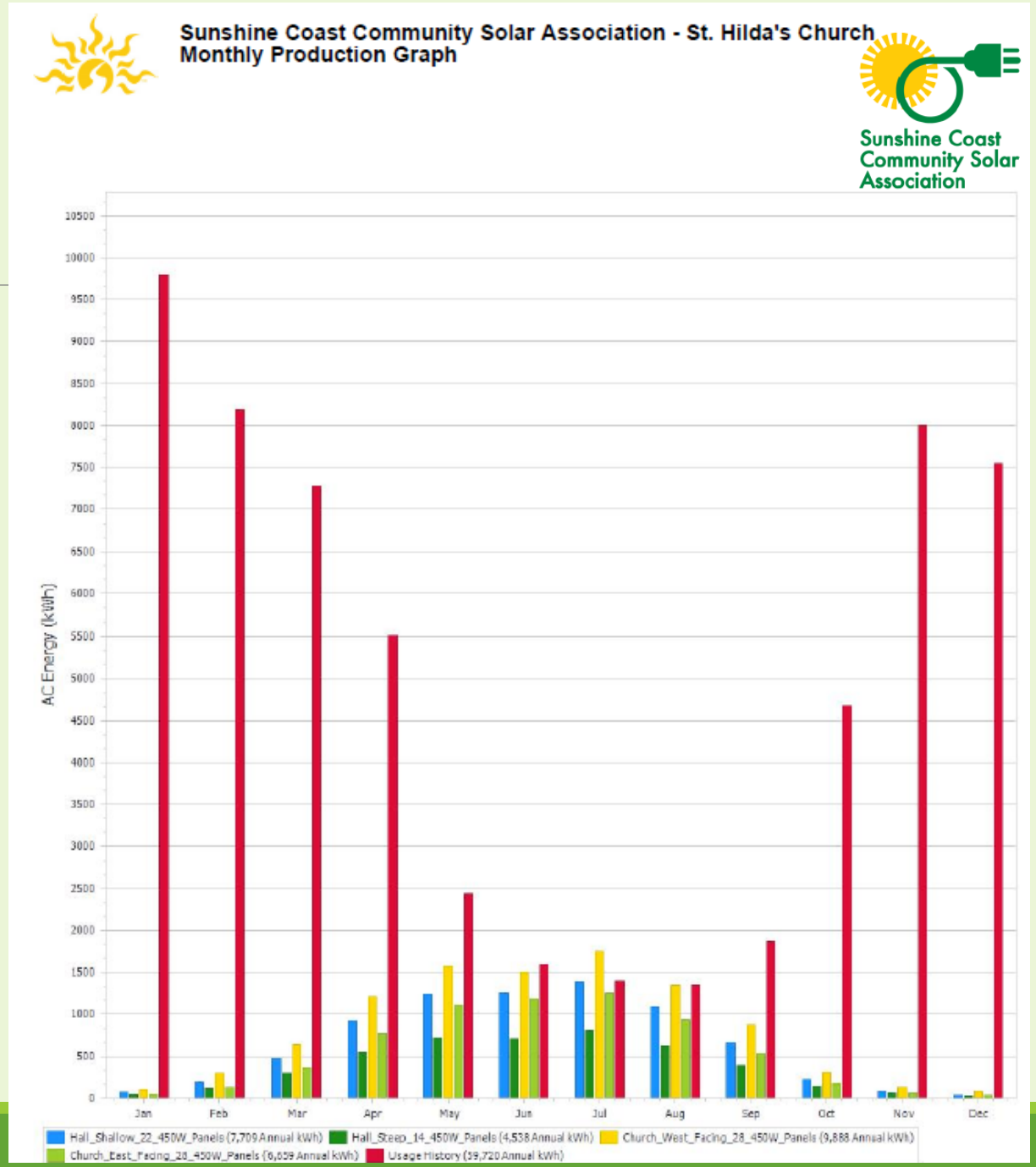
Sourcing our energy

- An assessment for each roof:
  - Hall, low slope roof
  - Hall, steep roof
  - Church, west-facing roof
  - Church, east-facing roof
- Each roof location is assessed for amount of sunlight compared to amount of shade, taking account of sun angle relative to roof angle for each month of the year.

Sunshine Coast Community Solar Association

Sourcing our energy

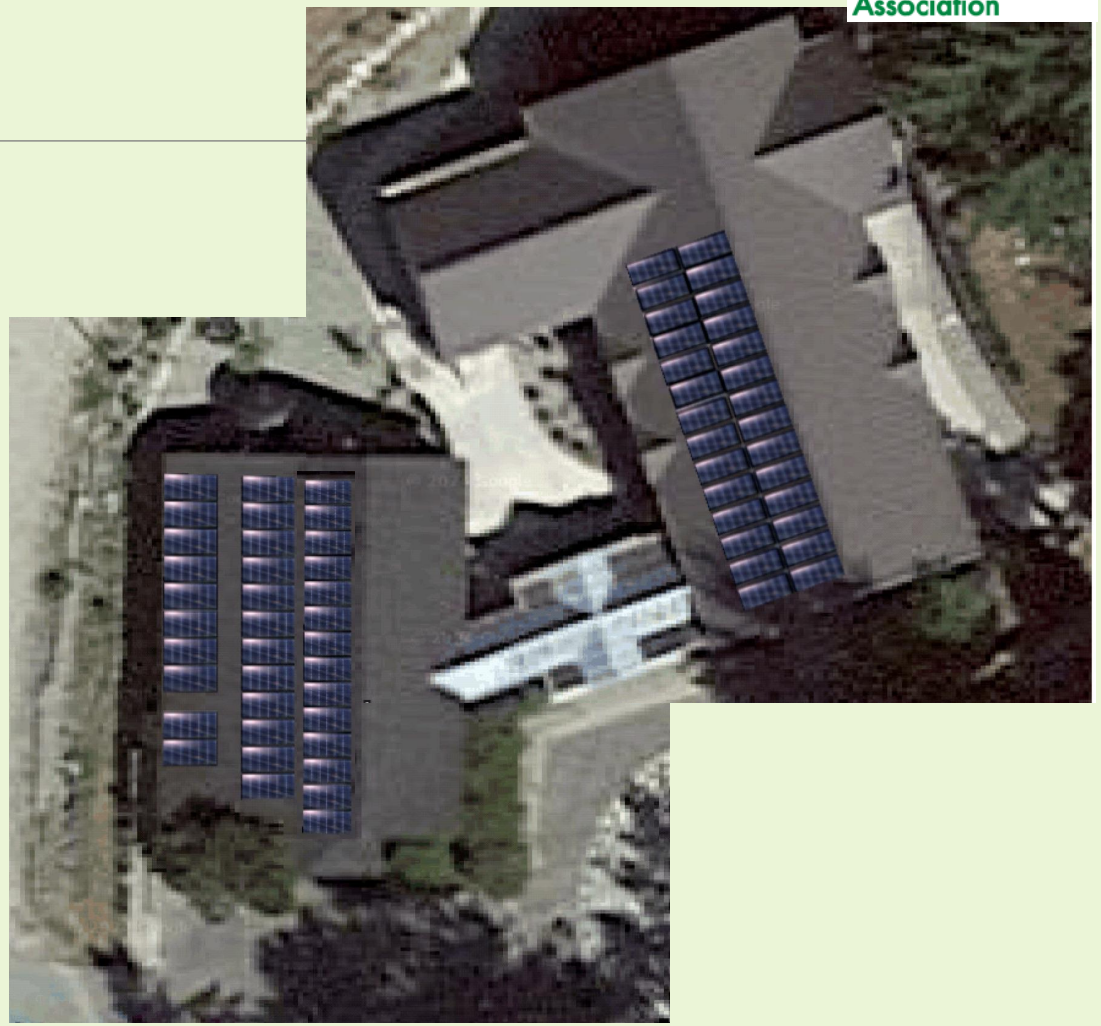
- The seasonal assessment:
  - Red bars show the estimated energy consumption, in kilowatt hours per month
  - The other bars show the energy (kWh) which could be generated from the sun on different parts of our roof.
    - Blue – Hall, low slope roof
    - Dark green – Hall, steep roof
    - Yellow – Church, west-facing roof
    - Light green – Church, east-facing roof
  - Obvious seasonal mis-match of supply and demand.
  - Trading credit with BC Hydro allows us to benefit despite the mismatch.



Sourcing our energy

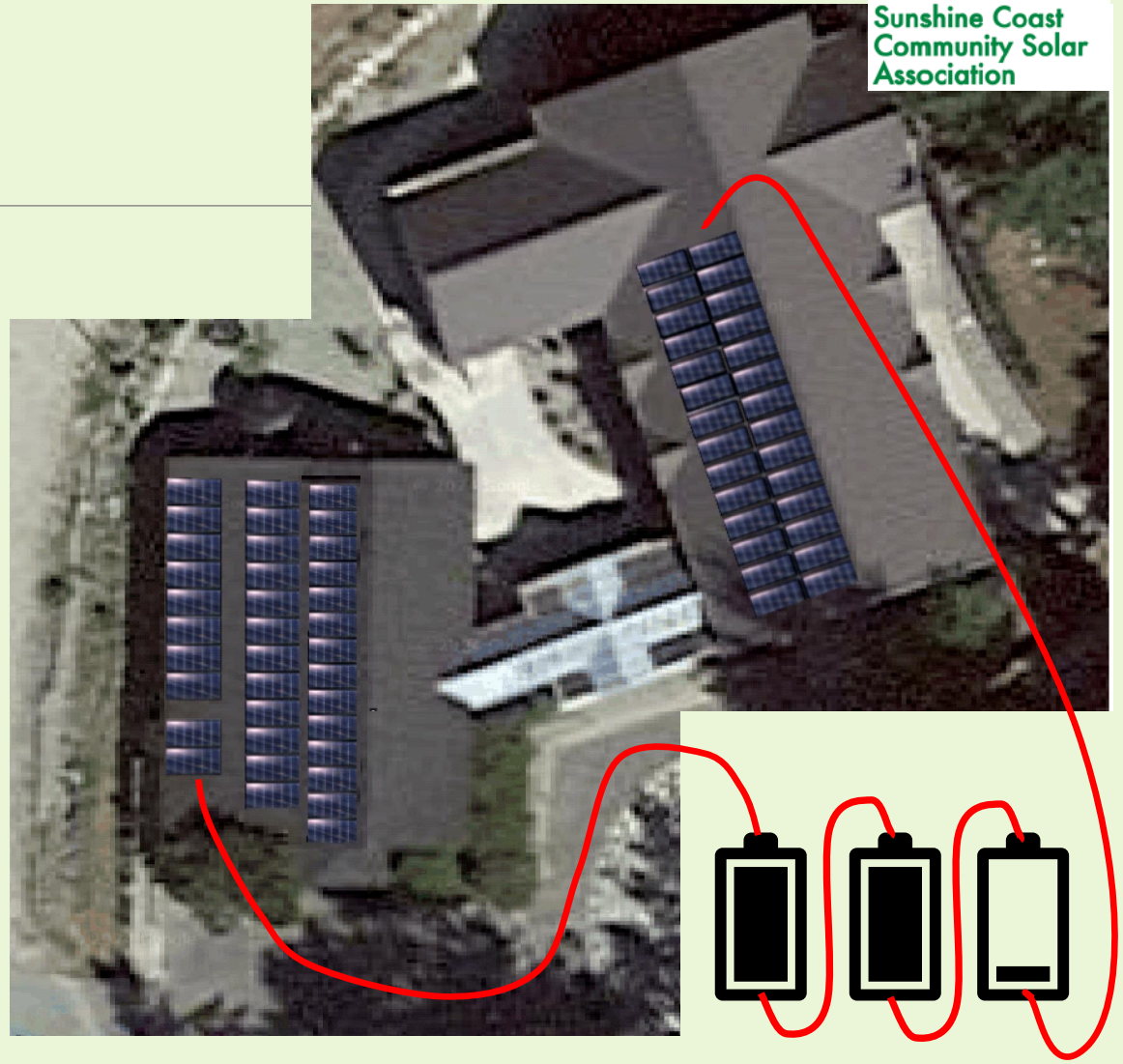
- The proposals:
  1. Thirty six 450W panels on the west-facing roof of the hall
     - estimated to produce approximately 12,200kWh/year
     - costs $36,000 to install,
     - replaces 20% of current Hydro consumption
     - saves $1,600/year at current rates.

  2. Twenty eight 450W panels on the west-facing roof of the church
     - estimated to produce approximately 9,800kWh/year
     - costs $31,000 to install,
     - replaces 16% of current Hydro consumption
     - saves $1,300/year at current rates.



Storing our energy

- The Battery Proposal:
  - Adding batteries to the solar power system allows the system to be self-sustainable.
  - Without a battery system, when the grid goes down, so does the solar panel system.
  - A battery bank allows the solar panel electricity to be used during a grid outage.
  - Provides resilience from a community emergency preparedness point of view.



Where are we on our road map:

1. Assess our facilities and energy use, emissions and costs to help:
   - ✓ identify priorities - complete
   - ✓ see the impact – on-going
2. Lighting
   - Conversion to LED – in progress and almost complete
3. Heating and Cooling
   - ✓ Insulation -
   - Heat Pumps – seeking grant funding for hall, requesting quotations for offices, Gathering Room and Nave.
4. Sourcing and securing our energy
   i. Generation: Solar Panels – investigate funding sources and obtain quotations.
   ii. Storage: Batteries – an option for further future investigation.

Energy Plan Questions?

Ask us!

REDUCING CONSUMPTION, REDUCING EMISSIONS, REDUCING COSTS.