

# Banff National Park Net-Zero 2035:

## Insights from the Banff Eco-Transit Hub Project

**Merkebe Demissie, PhD**

Research Associate, Dept. Civil Eng.,  
U Calgary

[merkebe.demissie@ucalgary.ca](mailto:merkebe.demissie@ucalgary.ca)

**David Layzell, PhD, FRSC**

Chief Energy Systems Architect, Transition Accelerator  
Professor & Director, CESAR, U Calgary

[dlayzell@ucalgary.ca](mailto:dlayzell@ucalgary.ca)

Nov. 10, 2020 (V2)

**The Transition  
Accelerator**



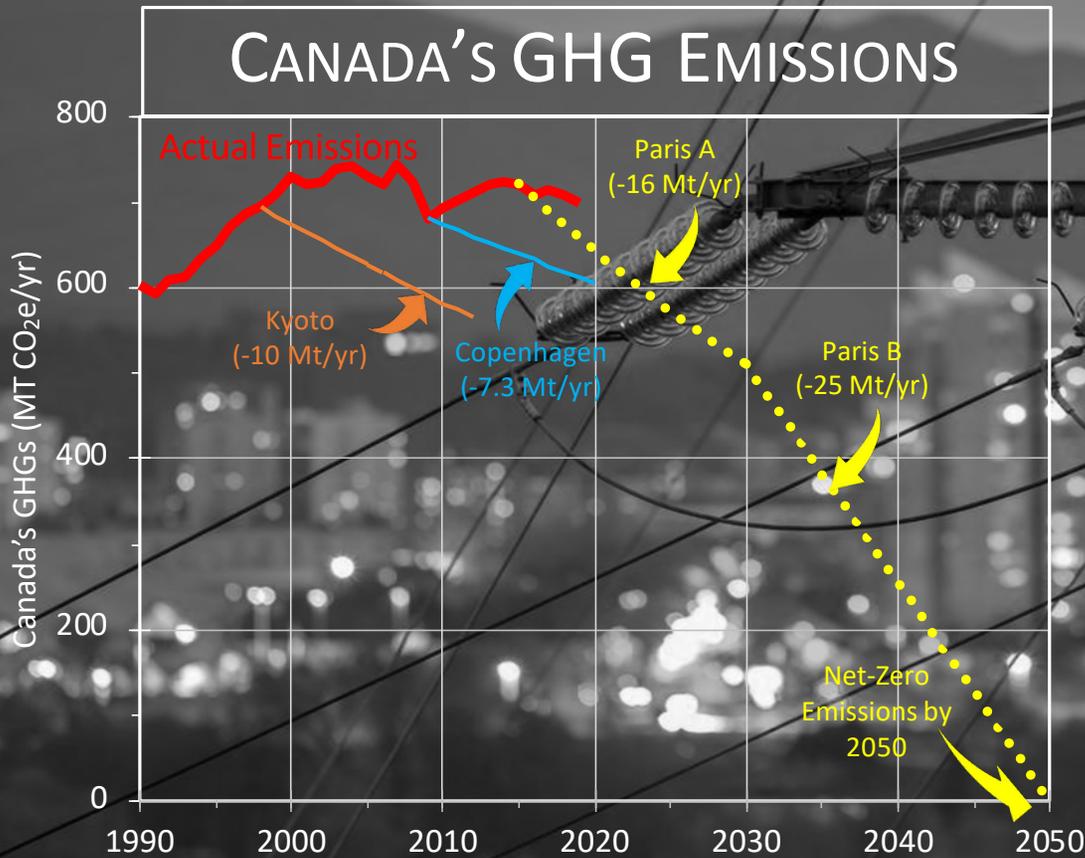
**L'Accélérateur  
de transition**

Project  
Supported by:





## CANADA'S GHG EMISSIONS



\* <https://sdg.iisd.org/news/73-countries-commit-to-net-zero-co2-emissions-by-2050/>

## NET-ZERO EMISSIONS BY 2050

COMMITTED TO BY CANADA  
AND 72+ OTHER COUNTRIES\*

*How can Canada win?  
What are the best  
transition pathways?*



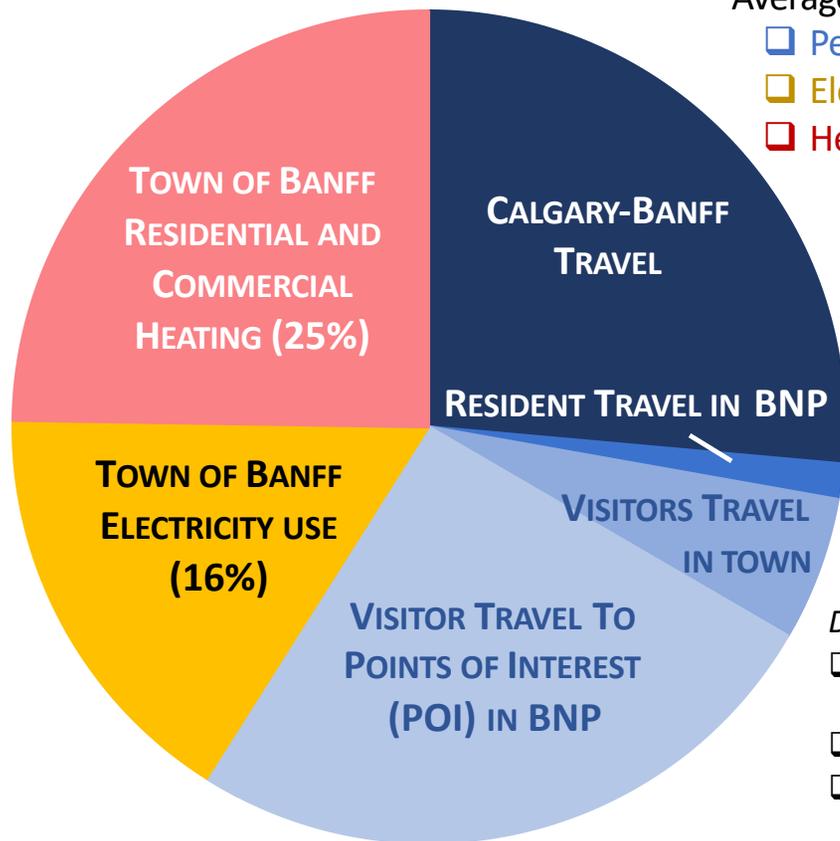
**The Transition  
Accelerator**



# The Greenhouse Gas Footprint of Banff National Park



**Life Cycle Emissions**  
322,000 t CO<sub>2</sub>e/year

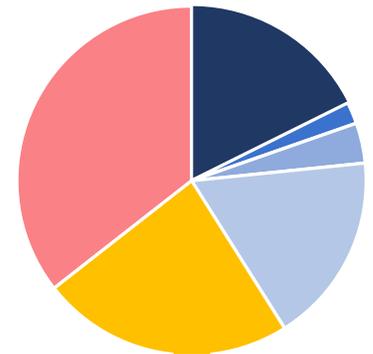


Averaged over the year:

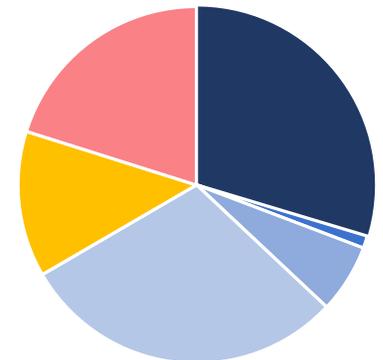
- ▣ Personal mobility: 59%
- ▣ Electricity: 16%
- ▣ Heating: 25%

Focus of the Banff Eco-Transit Hub Project...

Winter  
(Oct to Mar)



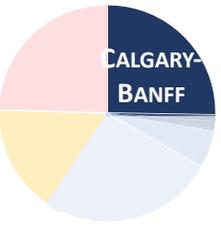
Summer  
(Apr to Sept)



Does not include emissions from:

- ❑ Trains, trucks or cars driving through BNP without stopping;
- ❑ Freight deliveries to/from Banff
- ❑ Commercial & Residential heating outside of Banff townsite

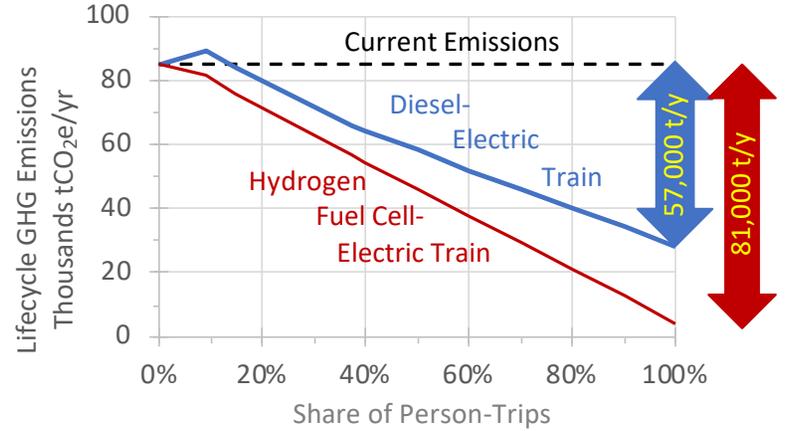
# Getting to Banff from Calgary



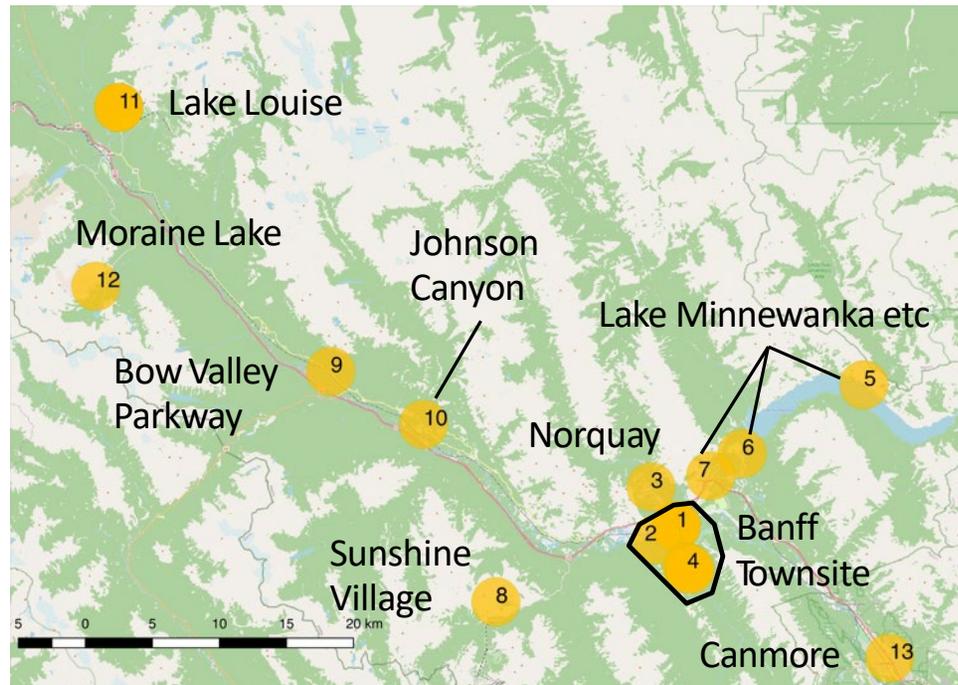
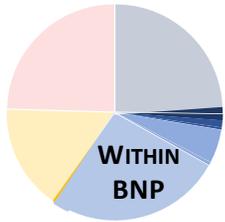
Current  
GHG  
Footprint:

- ❑ 85,200 tCO<sub>2</sub>e/yr
- ❑ 2.4 million trips/yr (commuter + tourist)
- ❑ 144 to 290 km round trip
- ❑ 95% of emissions from cars

New Passenger  
Train has been  
proposed:



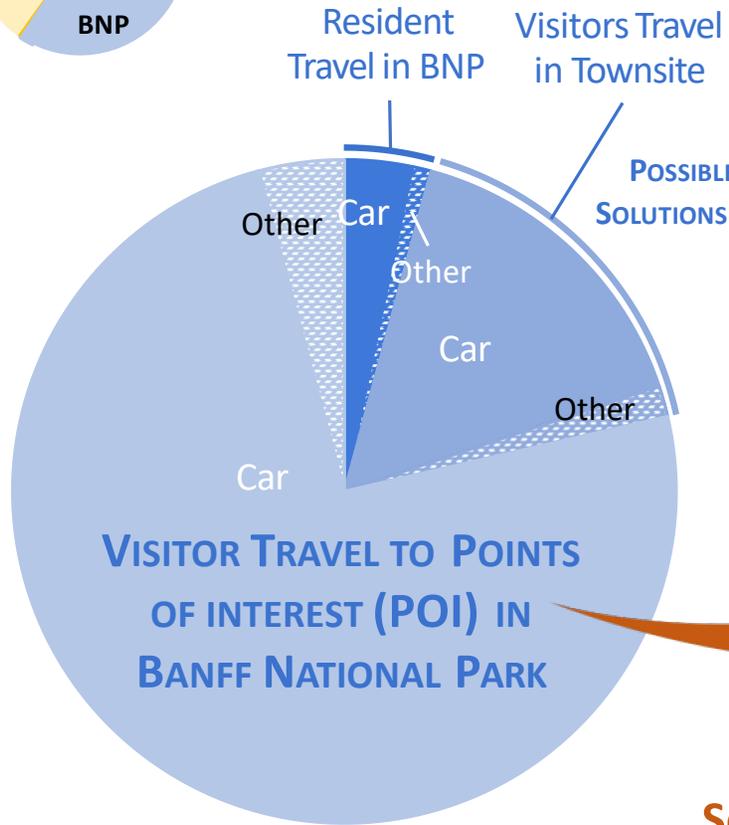
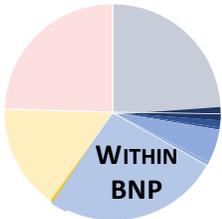
# Major Travel Destinations within Banff National Park





# Travel GHGs within Banff National Park

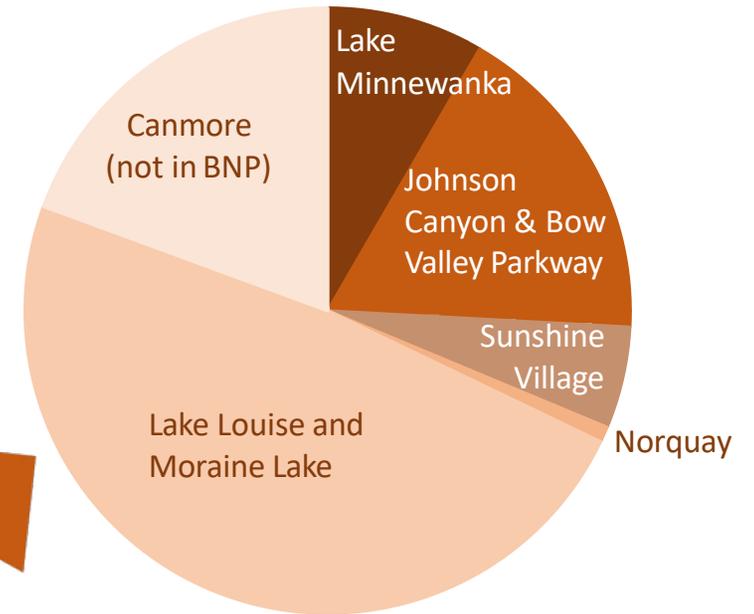
(~105,000 tCO<sub>2</sub>e/yr)



- POSSIBLE SOLUTIONS:**
- Shuttle buses?
  - Pers. Rapid Transit?
  - Autonomous, shared vehicles?
  - Battery or H<sub>2</sub>-electric vehicles?
  - ???

## Destinations outside of Banff Townsite

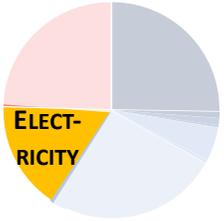
(~83,200 t CO<sub>2</sub>e/yr)



- POSSIBLE SOLUTIONS:**
- Shuttle only Service to Points of interest (SOS to POI)?
  - Autonomous, shared vehicle fleets?
  - Battery or H<sub>2</sub>-electric vehicles?
  - ???

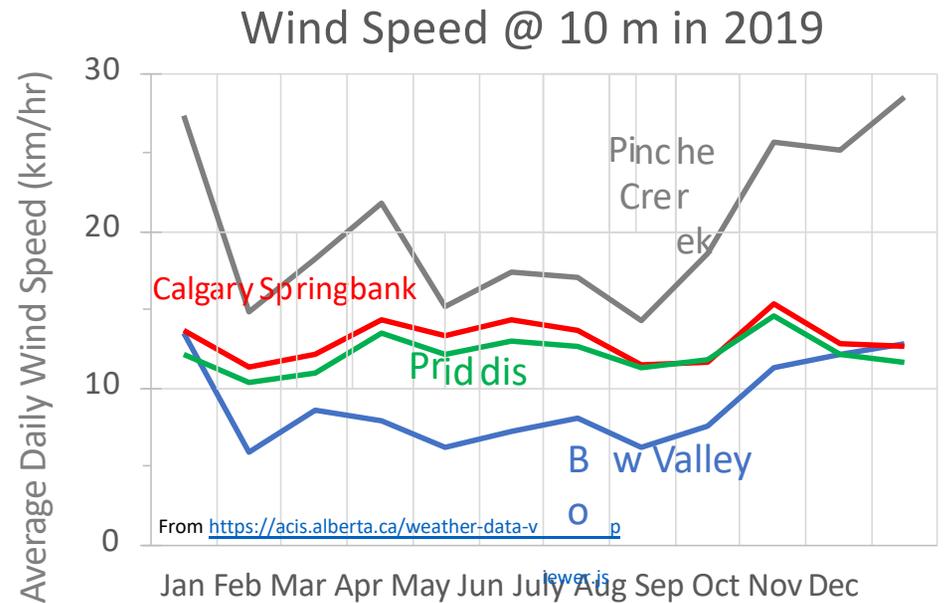
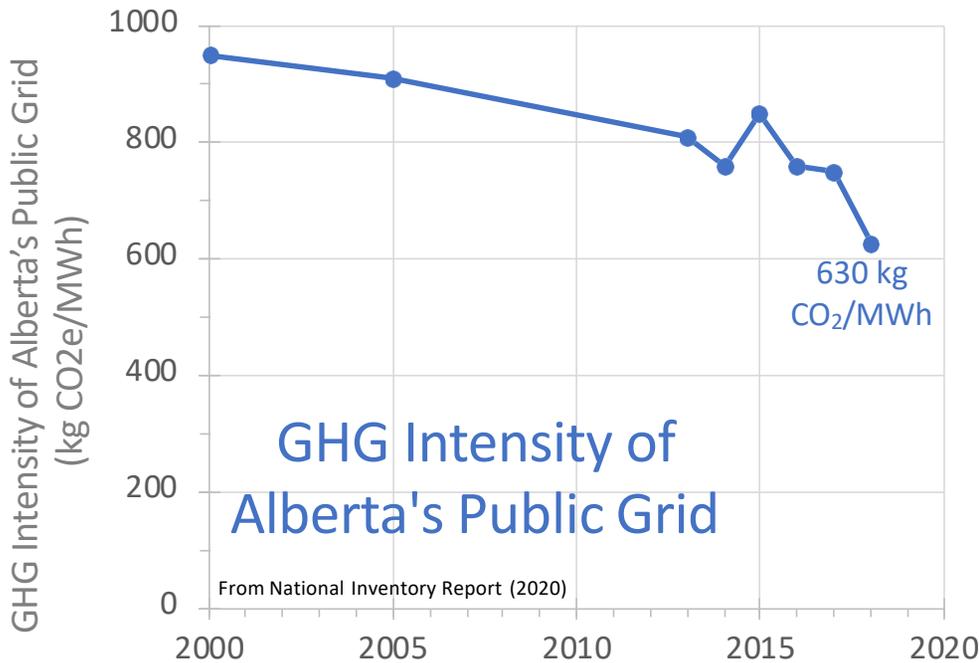


# GHGs From Electricity consumed in Banff

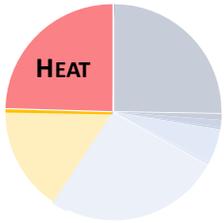


- ❑ Banff uses about 83,333 MWh/yr of Alberta's public grid electricity;
- ❑ At 630 kg CO<sub>2</sub>/MWh, GHG emissions from power generation = 52,500 t CO<sub>2</sub>/yr
- ❑ Grid Intensity is declining...

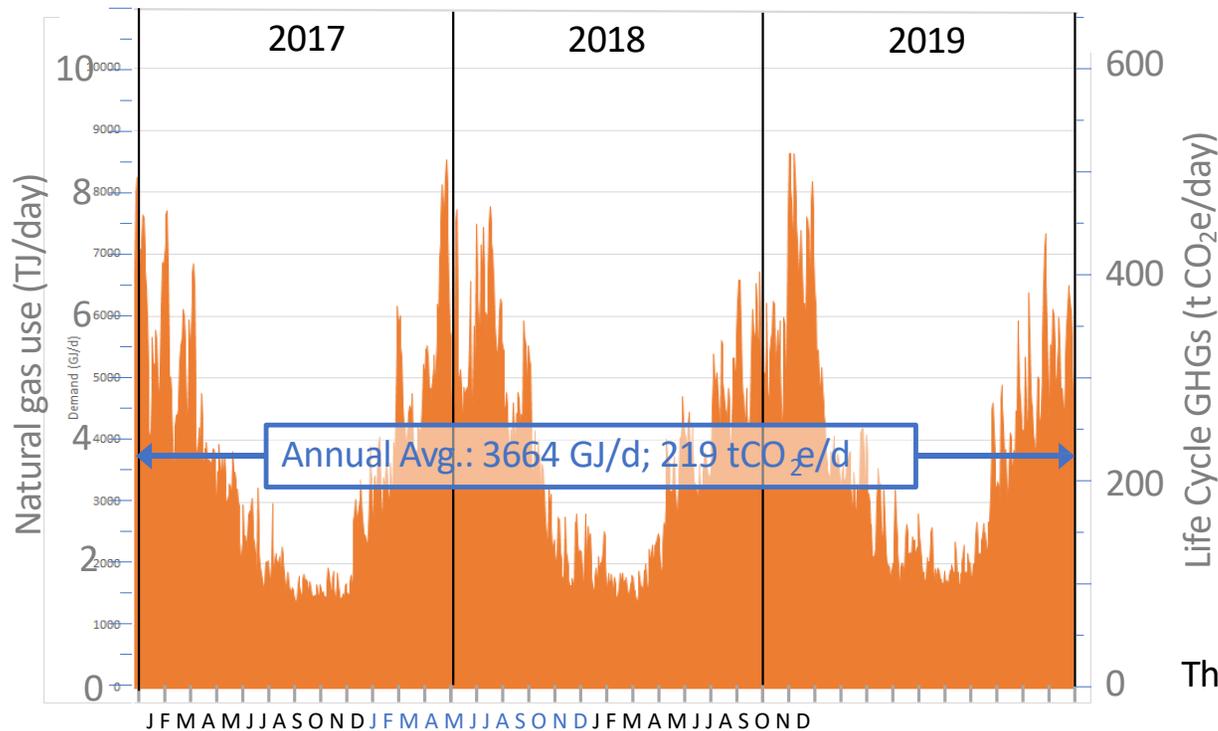
- ❑ Perhaps explore nearby wind resource potential...



# GHGs From Residential and Commercial Space & Water Heating



Current Energy Use and GHG Emissions



## Possible Solutions:

- Building Efficiency Improvements
- Electrify Heating (*will be a challenge with seasonal variation*)
- Decarbonize Natural Gas
  - Renewable Natural Gas
  - Hydrogen

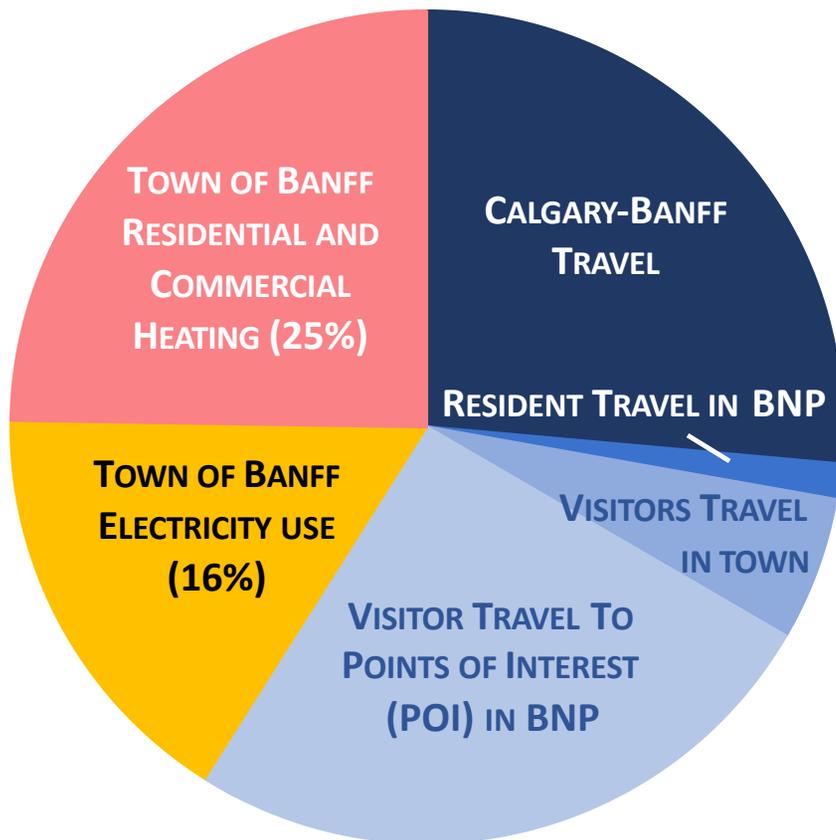
Thanks to



# Conclusions



**Life Cycle Emissions**  
322,000 t CO<sub>2</sub>e/year



- Banff National Park is well positioned to take a leadership role in Canada's transition to net zero;
- The insights gained from a net-zero transition in BNP would be valuable to communities across Canada;
- With ~2M international visitors/year, a net zero BNP would help to (re)brand Alberta & Canada as progressive and environmentally responsible.

However...

A **credible** and **compelling** plan is needed – one that is **capable** of actually achieving the objective!

# Thank you!

**Merkebe Demissie, PhD**

Research Associate, Dept. Civil Eng.,  
U Calgary

[merkebe.demissie@ucalgary.ca](mailto:merkebe.demissie@ucalgary.ca)

**David Layzell, PhD, FRSC**

Chief Energy Systems Architect, Transition Accelerator  
Professor & Director, CESAR, U Calgary

[dlayzell@ucalgary.ca](mailto:dlayzell@ucalgary.ca)

Nov. 10, 2020 (V2)

**The Transition  
Accelerator**



**L'Accélérateur  
de transition**

Project  
Supported by:

