
**OUR CLIMATE
FUTURE**
climate change action plan



Spruce Grove Climate Change Action Plan

May 9, 2022

Overview

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 - Update from February
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- Questions

Introduction

Goal

- Describe the creation process and high level results for the City's Climate Change Action Plan
- Present suggested motions to Council regarding adoption of this plan

Update from February

- An initial version of the CCAP was presented to the Committee of the Whole in February 2022
- The first version of the CCAP identified two possible GHG mitigation targets for the City, the ‘steep decline’ path and that ‘Canada path’
 - The current CCAP has adopted the ‘Canada Path’ as the ‘Spruce Grove Path to Net Zero Emissions’
- The first version of the CCAP focused the GHG emission reduction section on the results of detailed modelling;
 - This version shifts the focus to discrete actions that can be taken by the City to achieve the Spruce Grove Path to Net Zero Emissions
 - Detailed modelling results for this path are described in the associated technical report

Plan Components:

- Three technical reports
 - #1: Climate Change Vulnerability and Risk Assessment
 - #2: GHG Emission Projections and Reduction Scenarios
 - #3: Climate Change Adaptation & Greenhouse Gas Mitigation Actions: Review & Prioritization
- The overview report “Climate Change Action Plan: Our Climate Future”

Background

- The city's Environmental Sustainability Action Plan expired in 2021 and will be replaced with a 12-year Climate Change Action Plan (2022-2033)
- This new plan has incorporated citizen and stakeholder input , scientific research, and risk management to recommend a set of actions that the City can take to address climate change in an environmentally, socially, and financially responsible way.
- The Climate Change Action Plan helps to answer these two main questions:
 1. How can the City help prepare the community for predicted changes to local weather patterns?
 2. How can the City reduce its greenhouse gas emissions and help the community do the same?



Sarah Prescott
Project Manager, Climate
Mitigation and Adaptation

**Project Management &
Public Engagement**



Richard Boyd
Director, Research

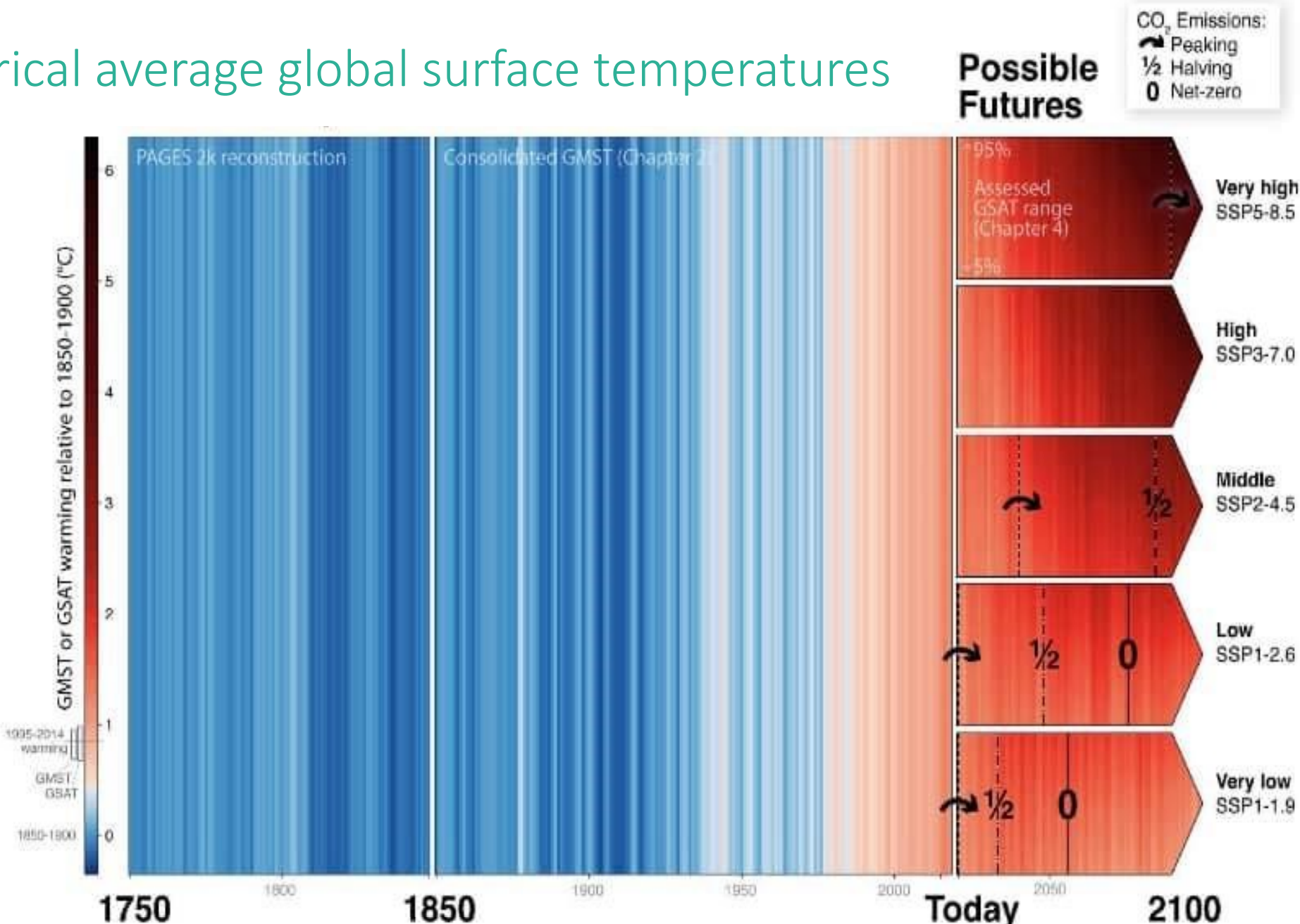
**GHG Modelling &
Mitigation**



Jeff Zukiwsky
Director, Climate
Adaptation & Resilience

**Vulnerability & Risk
Assessment**

Historical average global surface temperatures





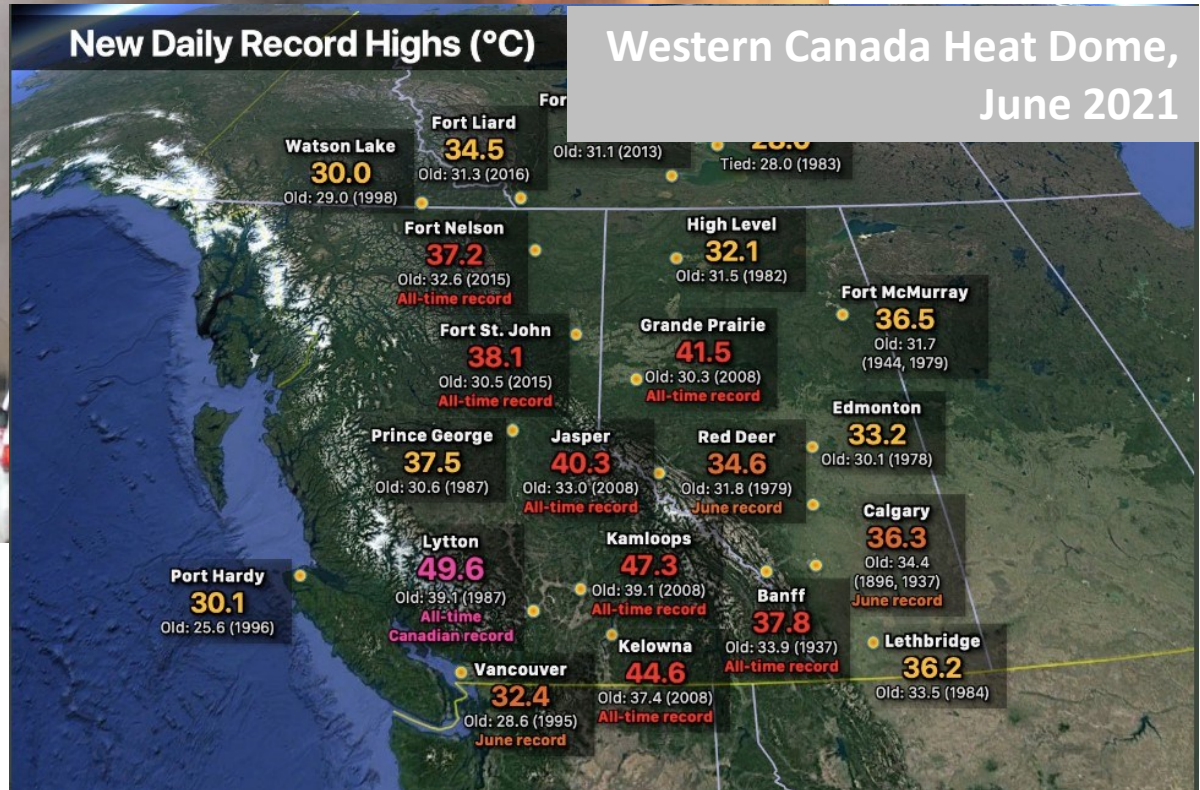
High River Flood 2013



Fort McMurray, Alberta, Canada

May 3, 2016

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IPCC Sixth Assessment Report: April 2022

“We are at a crossroads. The decisions we make now can secure a livable future. We have the tools and know-how required to limit warming. I am encouraged by climate action being taken in many countries. There are policies, regulations and market instruments that are proving effective. If these are scaled up and applied more widely and equitably, they can support deep emissions reductions and stimulate innovation.”

-IPCC Chair Hoesung Lee.

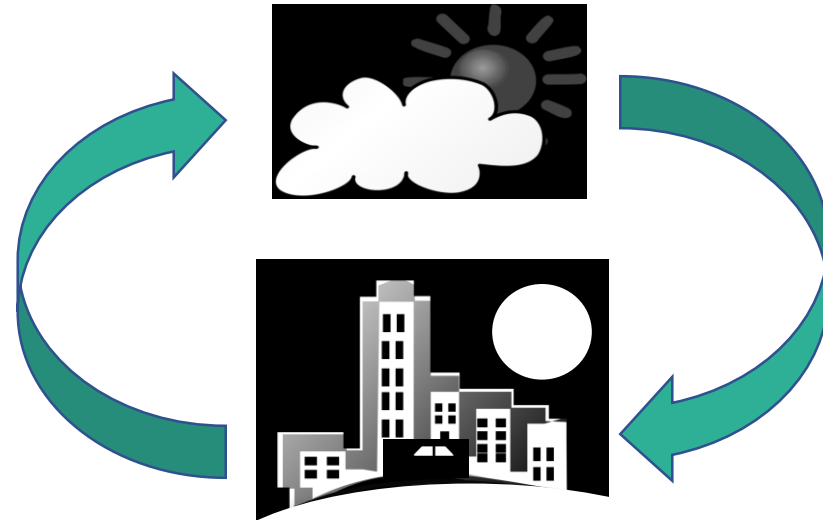
“The global temperature will stabilize when carbon dioxide emissions reach net zero. [To limit warming to] 1.5°C, this means achieving net zero carbon dioxide emissions globally in the early 2050s”

-IPCC Press Release

Why create a Climate Change Action Plan

To address the two different components of climate change planning:

Greenhouse gases are **released** to the atmosphere, trapping heat and **causing climate change**



Changes to the climate lead to **changing** local long term **weather patterns** which will impact Spruce Grove

Climate Change Mitigation:
Reducing local greenhouse gas emissions

Climate Change Adaptation:
Preparing for predicted changes to local weather patterns

Action Assessment Criteria & Methods

Principles

- Recommended actions in this plan were guided by the following core principles:
 - **Comprehensive:** Considered the role that both the City and wider community can play in reducing greenhouse gas (GHG) emissions and enhancing resilience to climate change.
 - **Science-based:** Makes use of the latest climate research and data.
 - **Co-benefits:** Promotes actions that have many economic, social and environmental benefits for the community.
 - **Equity:** Ensures an inclusive, just and equitable transition to a climate resilient and low carbon future.
 - **Public engagement:** Meaningfully engaged the public during plan development.

Overall Process: Adaptation and GHG Mitigation

Adaptation



Vulnerability and Risk Assessment



Identify potential actions through

- public engagement
- engagement with staff
- review of plans in other prairie communities



Use multi action criteria assessment to rank the overall benefits of actions and recommend actions for future investigation

GHG Mitigation



GHG Modelling



Multi criteria action assessment

Effectiveness	Benefits (averaged)	Vs.	Costs (averaged)	Capital Costs
Complementary Co-benefits				Operating Costs
Other benefits				Negative Side Effects
Equity				Feasibility
Flexibility				Acceptability

Action Types

- To help organize next steps, actions were organized into various ‘types’ and ‘subtypes’
 - **Governance**
 - Assessments, Plans, Policies
 - **Ventures**
 - Operations, Projects, Programs, Resourcing
 - **Outreach**
 - Engagement, Partnership, Advocacy

Climate Change Adaptation:

Vulnerability and Risk Assessment Results

Risk Assessment Results

- 4 high priority risks and 1 high priority opportunity
- 12 moderate priority risks and 3 moderate priority opportunities
- 4 low priority risks
- Adaptation actions developed for high and moderate priority risks and opportunities

Label	Climate risks and opportunities
High Priority	Drought Heat wave Longer construction season (Benefit) Freezing rain Hailstorm
Medium Priority	Water supply shortage High winds Increased water demand Invasive tree species Reduced winter recreation Lightning Increased space cooling Wildfire smoke Freeze-thaw cycles Ground level ozone Urban flooding Heavy snowfall Water supply shortage Invasive tree species Reduced winter recreation Increased summer recreation season (Benefit) Increased agricultural productivity (Benefit) Reduced space heating demand (Benefit)
Low Priority	Cold stress Tornado River flooding Wildland fire

Adaptation Action Sectors

Action Groupings and Number of Recommended Actions to Investigate Further

1. City Buildings and Infrastructure (13 actions)
2. City Services (11 actions)
3. Home, Businesses and Local Economy (4 actions)
4. Water Management and Natural Infrastructure (10 actions)

Example Actions: City Programs and Outreach

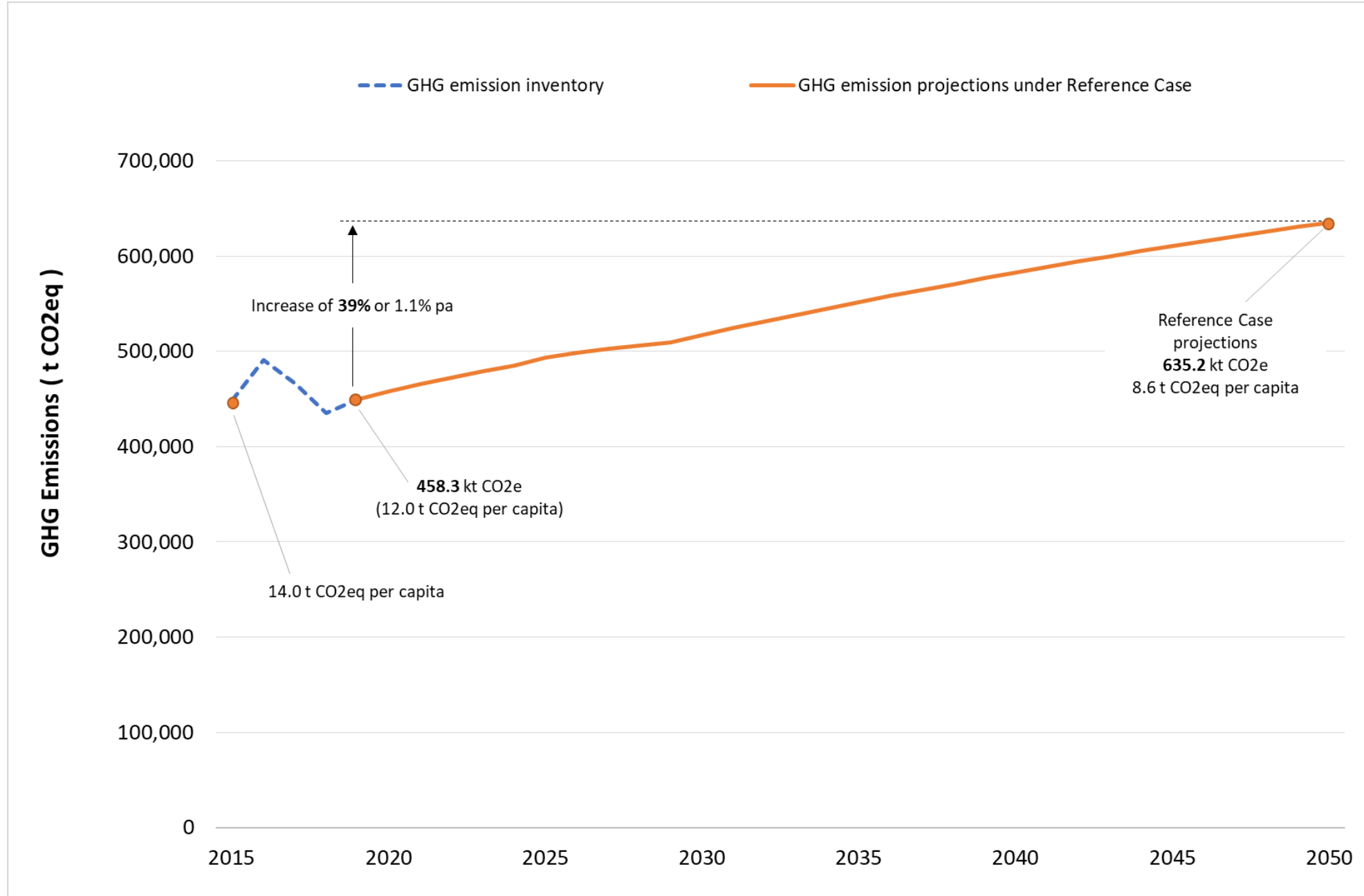
Action No.	Action	Action Type	Action Sub-type	Score
1	<p>Encourage residents to create climate resilient home gardens</p> <p>Educate residents on how to design climate resilient home gardens, considering factors such as drought, water supply shortage, and extreme heat, as well as how to manage pests and invasive species. Similar to the Edmonton in Bloom program, create an Edible Yard award in coordination with the award to create front yards with native species</p>	Ventures	Engagement	Very High
2	<p>Enhance existing neighbourhood social resilience programs</p> <p>Support and empower neighbourhood social resilience programs including the Spruce Grove Neighbour Network and Block Party Program which help residents create connections with their neighbours and within their neighbourhood, and help neighbours to work together more effectively during extreme weather events. Make sure to include programs targeting more vulnerable neighbourhoods and populations such as the elderly, isolated and low income.</p>	Ventures	Engagement	Very High
3	<p>Create an Urban Agriculture Plan</p> <p>Create an Urban Agriculture Plan to provide guidance on local urban agriculture development and resiliency in Spruce Grove. The plan could consider how to increase local food production at both a local and commercial idea. This could include ideas such as more or better supported community gardens, urban bee and chicken keeping, greenhouses, indoor gardens, irrigation, etc. The Plan would consider future climate changes and identify how the City can support the growing, processing, and distribution of food and food products in and around the City, by residents, private entities, and potentially by the City itself. This plan should also consider the risk of increased invasive species in the future.</p>	Governance	Plan	Very High

Climate Change Mitigation: GHG Mitigation Assessment Results

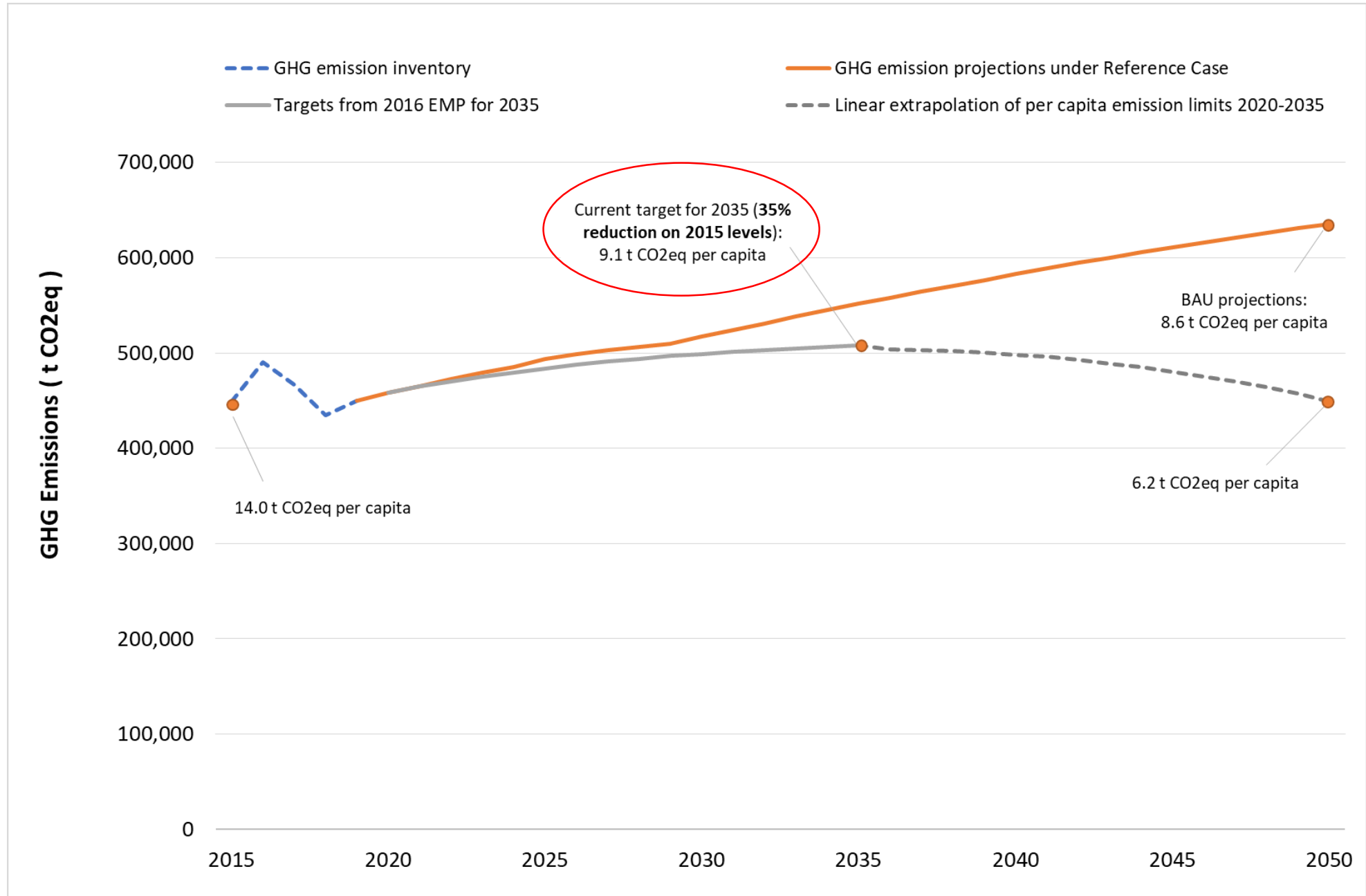
GHG Source Sectors: High to Low

	Sector Name	Description	Estimated City GHG Emissions in 2020	
Community	Community Transportation & Land Use	Vehicles	45%	98%
	Homes	Energy use in homes	30%	
	Businesses + Industry	Energy use in businesses	21%	
	Solid Waste	Landfilled organic waste	3%	
Municipality	City Buildings	Energy for city buildings	1%	2%
	City Fleet	Fuel and energy for city vehicles and equipment	0.2%	
	Lights & Signs	Streetlights, signs, etc.	0.2%	
	Water & Sewage	Water and sewage pumping	0.2%	

Projected GHG emissions for the City – the “Reference Case”



Existing 2016 GHG emission reduction goal



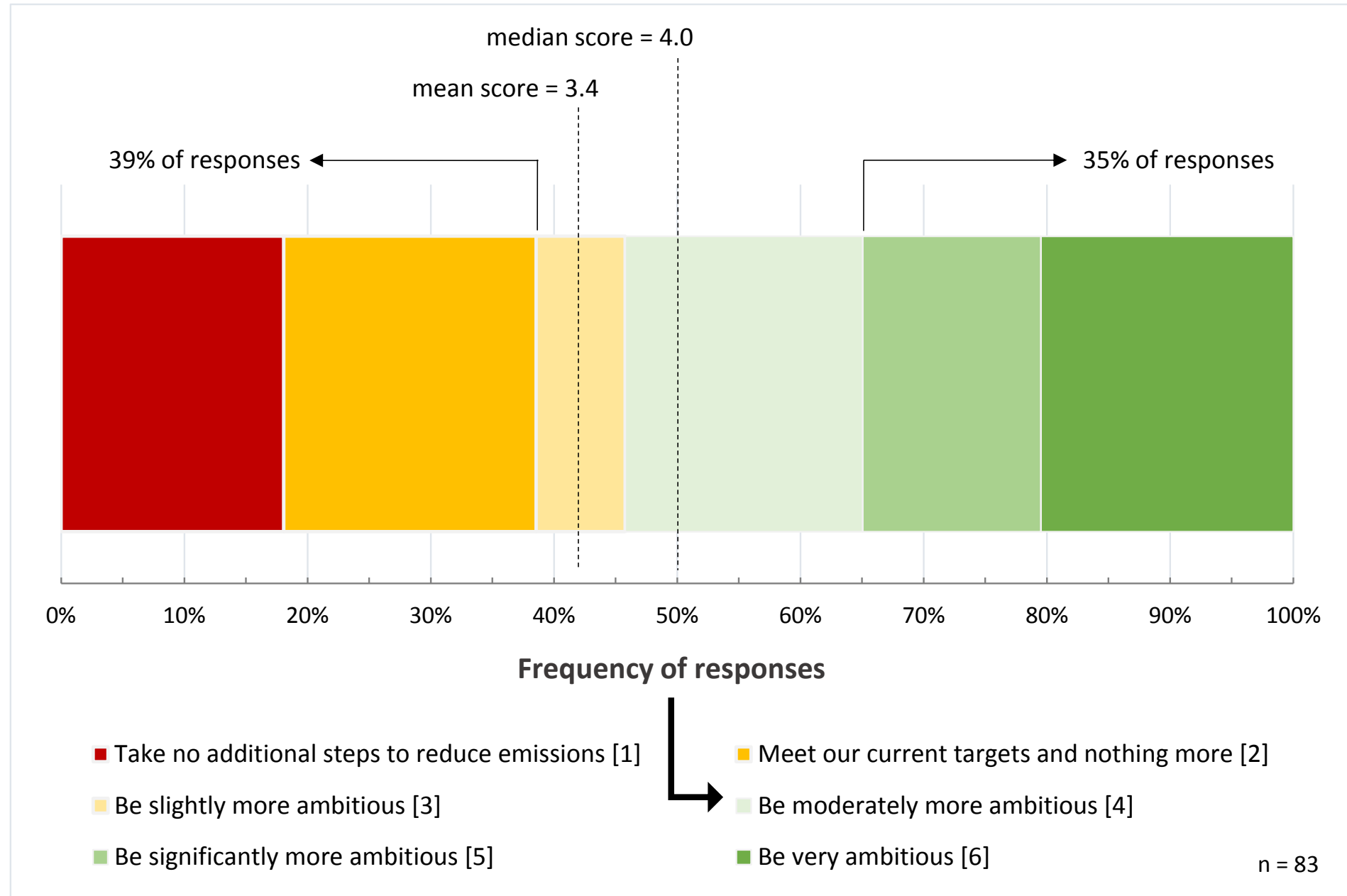
GHG Reduction Pathway Design Considerations

Determined based on:

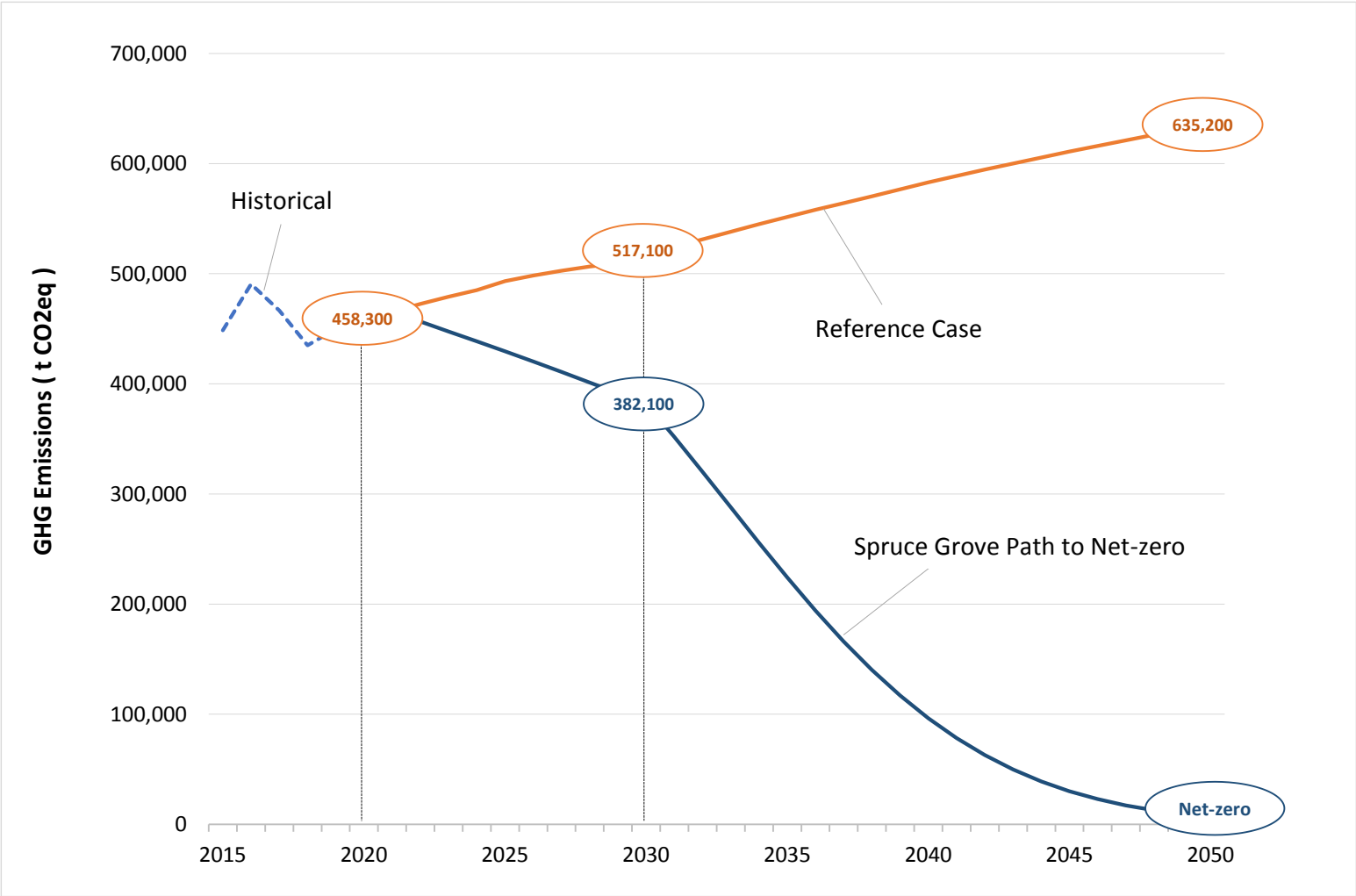
- Climate science
- Principles of equity
- Public engagement
- Consideration of all GHGs produced within Spruce Grove
- Feedback from City Staff and the Committee of the Whole

Spruce GHG Reduction Ambition: Public Opinion

- **'Meet our current targets and nothing more'** was defined as meeting the city goal of 9 tCO₂eq/p by 2035
- **'Be very ambitious'** was defined as per person GHG emissions falling to 3 tCO₂eq/p by 2030 and to 0 (zero) tCO₂eq/p by 2050
- **Some age differences noted**; 63% of respondents aged 18-44 preferred 'moderate to very ambitious' actions, this dropped to 40% of respondents aged 45 years or older



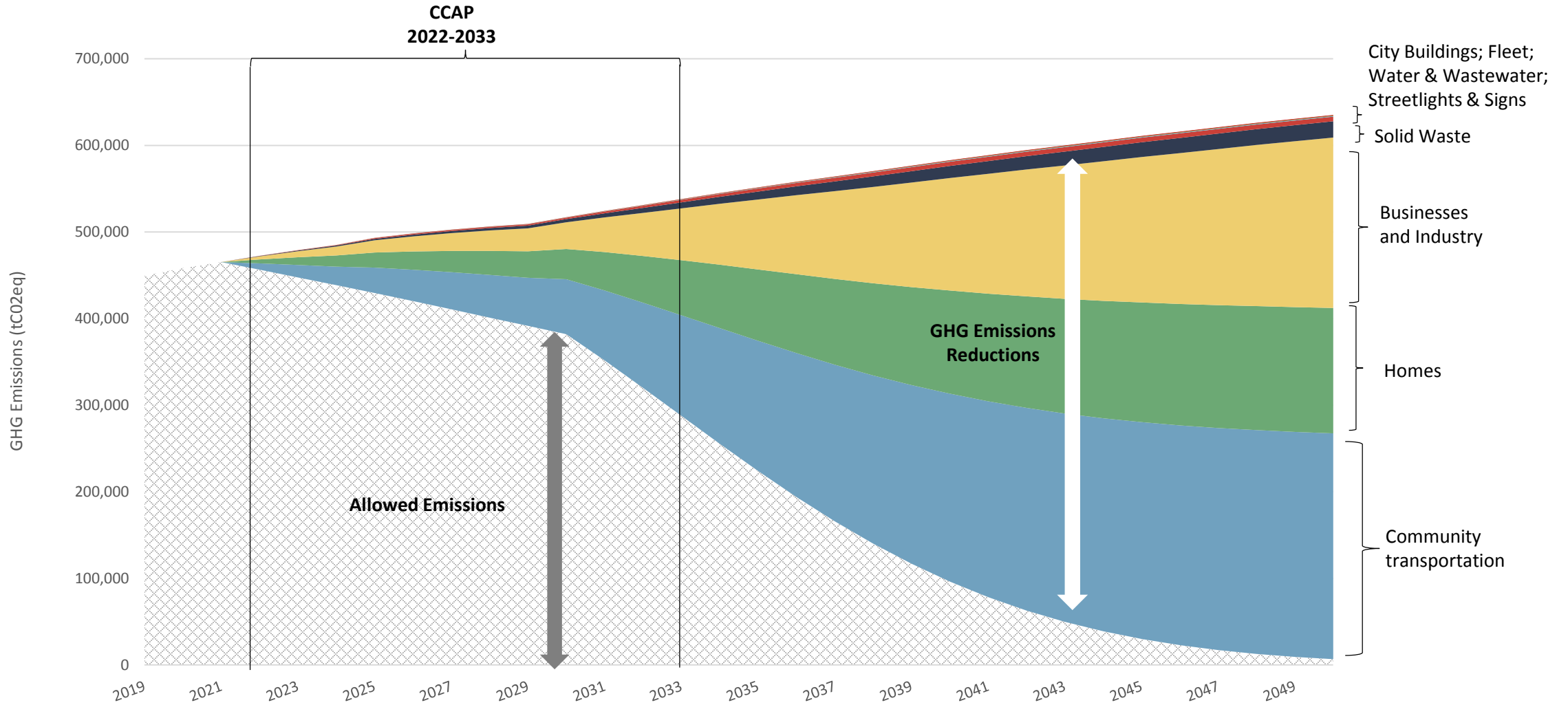
Spruce Grove's Path to Net-Zero Community-Wide Emissions: Bending the Emissions Curve



City GHG Emissions: Past, Present and Future

Time Period	GHG Emissions/person tCO ₂ eq/p	Total City GHG Emissions tCO ₂ eq
1996	19	271,000
2020	12	458,000
2030 'Spruce Grove Net Zero Path'	7.6	382,000
2033 (end of CCAP) 'Spruce Grove Net Zero Path'	5.4	287,000
2050 'Spruce Grove Net Zero Path'	0	0

GHG Emission Reductions by Source Sector



GHG Modelling Assumptions:

- Emissions reductions were shared equally across all source sectors
- Include consideration of
 - public policy adoption rates
 - technical feasibility (savings rates)
- Hierarchy of Actions:
 - #1 Avoid
 - #2 Improve
 - #3 Switch
 - Not modelled: removing GHG emissions directly from the atmosphere

GHG Mitigation: Action Sectors

Action Groupings and Number of Recommended Actions to Investigate Further

1. City Wide Actions: Energy Supply (8 actions) and Carbon Sinks (2 actions)
2. Community Transportation (13 actions)
3. Homes (15 actions)
4. Businesses and Industry (4 actions)
5. Solid Waste (4 actions)
6. City Buildings (6 actions)
7. City Fleet (3 actions)
8. City Lights and Signs (3 actions)
9. City Water and Sewage (3 actions)

Example Actions: Homes

Action No.	Action	Action Type	Action Sub-type	Score
Action No	Action	Action Type	Action Sub-Type	Score
1	<p>New development sustainability checklist</p> <p>Enable and encourage city staff to provide a voluntary sustainability checklist for new developments to increase awareness of actions that could be taken to reduce GHG emissions and increase climate resiliency. Actions could be aligned to meet LEED or other standards.</p>	Ventures	Operations	Very High
2	<p>Lobby for prompt adoption of updates to energy building codes</p> <p>Encourage the provincial government to promptly adopt the regular updates to the National Building Code, and to adopt other appropriate energy efficiency requirements to the provincial building code</p>	Ventures	Engagement	Very High
3	<p>Amend permissions for non standard heating technologies</p> <p>Amend development permissions to allow for non-standard heat sources such as ground source heat pumps to be used on multiple sizes of building</p>	Governance	Policy	Very High
4	<p>Energy conservation education</p> <p>Continue existing program to educate residents about ways to use energy and water more efficiently in their homes</p>	Ventures	Engagement	Very High

Link Between GHG Modelling & GHG Actions

Type	No	Short Form Action	R-H1	R-H2	R-H3	R-H4
			Accelerate energy retrofits and building design	Increased heating from renewable energy sources	Increased energy from appliances, lighting, and space cooling from renewable energy sources	Shift towards multi-family buildings in new construction
Governance	3	Amend permissions for non standard heating technologies	X	X		
	5	Above-code new construction program	X	X	X	
Ventures	1	New development sustainability checklist	X	X	X	
	4	Energy conservation education	X			
	8	Home retrofit grant program	X			
	10	Home Energy Audit Assistance	X			
	11	Home retrofit CEIP program	X	X	X	
	12	CEIP implementation for home renewable energy		X	X	
Outreach	13	Voluntary home labelling	X			
	2	Lobby for prompt adoption of updates to energy building codes	X	X	X	
	6	Lobby for higher energy efficiency standards in building code	X			
	7	Encourage builders & developers to make solar-ready homes		X	X	
	9	Lobby for solar-ready homes in building code		X	X	
	14	Design homes for larger household sizes				X
	15	Encourage construction of smaller homes	X			

Summary

Summary and Next Steps

- This plan provides a roadmap to a carbon-neutral and climate resilient Spruce Grove
- A total of 99 actions are recommended for further investigation:
 - 38 climate adaptation actions
 - 61 GHG mitigation actions
- To start implementation of this plan, specific departments would be identified to work on particular actions.
- Monitoring, evaluation and review of progress on this plan is recommended to occur every 4 years, in line with the plan's carbon budgets
- Implementation of this plan would help Spruce Grove achieve its goal of being a resilient, safe and attractive place to live, work and play, both now and into the future

Suggested Motions

Motion #1

THAT the climate Change Action Plan, Adaptation and Greenhouse Gas Mitigation Actions Technical Report, Greenhouse Gas Projections and Reduction Scenarios Technical Report, and Vulnerability and Risk Assessment Technical Report be accepted as information

Motion #2

THAT Council support aspirational targets towards:

- the adoption of the recommended adaptation actions as outlined in the Climate Change Action Plan; and
- reduction of Spruce Grove's Green House Gas Emissions along the "Spruce Grove" Path as outlined in the Climate Change Action Plan.

Questions?