

# Washington Energy Decarbonization Examination

Decarbonization Advisory Group Meeting 4  
February 1, 2023

# Welcome + Introductions



**UTC**

Washington Utilities  
and Transportation  
Commission

**SSC**

# Meeting Operating Guidelines

1. Let's share airtime in order to listen to, and hear from, as many perspectives as possible.
2. Let's manage our participation together to start and end on time.
3. Let's use respectful and inclusive language.

# Zoom Etiquette

1. Please stay on mute when not speaking, and use the chat to ask questions, while presentations are in-progress.
2. Please use the “raise hand” function to ask a question during Q+A periods, and let us know your name and affiliation (if you have one).
3. Please note that we are recording this session.

# Agenda

1. Introduction
2. Project Overview
3. Equity Considerations
4. Co-benefits and co-harms
5. Feedback Lab
6. Next Steps

# Project Overview

**SSG**

# Why is the Commission undertaking this examination?

**Senate Bill 5092, section 143** provided funding for the Commission to:

“examine feasible and practical pathways for investor-owned electric and natural gas utilities to contribute their share to greenhouse gas emissions reductions as described in RCW 70A.45.020, and the impacts of energy decarbonization on residential and commercial customers and the electrical and natural gas utilities that serve them.”

**RCW 70A.45.020** states that Washington shall limit anthropogenic emissions of greenhouse gases (GHGs) as follows:

- (i) By 2020, reduce GHGs to 1990 levels, or 90.5 million metric tons;
- (ii) By 2030, reduce GHGs to 50 million metric tons, or 45% below 1990 levels;
- (iii) By 2040, reduce GHGs to 27 million metric tons, or 70% below 1990 levels;
- (iv) By 2050, reduce GHGs to 5 million metric tons, or 95% below 1990 levels.

# Senate Bill 5092, section 143 requirements

The examination must identify and consider:

“(i) How natural gas utilities can decarbonize;

(ii) The impacts of increased electrification on the ability of electric utilities to deliver services to current natural gas customers reliably and affordably;

(iii) The ability of electric utilities to procure and deliver electric power to reliably meet that load;

(iv) The impact on regional electric system resource adequacy, and the transmission and distribution infrastructure requirements for such a transition;

(v) The costs and benefits to residential and commercial customers, including environmental, health, and economic benefits;

(vi) Equity considerations and impacts to low-income customers and highly impacted communities; and

(vii) Potential regulatory policy changes to facilitate decarbonization of the services that gas companies provide while ensuring customer rates are fair, just, reasonable, and sufficient.”



# What are we working on together?

By June 1, 2023, the Washington Utilities and Transportation Commission will use the Energy Decarbonization Pathways Examination to report to the legislature on “feasible and practical pathways for investor-owned electric and natural gas utilities to contribute their share to greenhouse gas emissions reductions as described in RCW 70A.45.020, and the impacts of energy decarbonization on residential and commercial customers and the electrical and natural gas utilities that serve them.”<sup>[1]</sup>

The legislature will use this information to inform discussions on decarbonization targets and policies for investor-owned natural gas utilities.

**This project is about identifying and describing the various pathways to achieve a certain level of natural gas emissions reduction. This project is not about choosing one pathway.**

[1] Senate Bill 5092 Section 143.4.

# Scenarios

# Common Actions

## Energy Reduction

Maximum mode shifting

Shift to higher density residences in urban zones

Deep retrofits in the building stock

Efficiency improvements in industry

Efficiency improvements in the building stock

# Low-Carbon Scenarios

Electrification	Alternative Fuels	Hybrid
Rapid electrification of existing residential and commercial heating systems	Existing residential and commercial natural gas heating systems replaced by natural gas heat pumps	Rapid electrification of existing residential and commercial heating systems
Deployment of decentralized solar PV and storage	Adoption of hydrogen into residential homes	Deployment of decentralized solar PV and storage
Increased electrification of commercial transportation	Clean hydrogen and CRNG used in a greater share of commercial transportation	Electrification, clean hydrogen and CRNG in commercial transportation
Electrification of some industrial processes	Industrial processes use clean hydrogen, RNG and other fuels	Industrial processes use clean hydrogen, RNG and other fuels
	Clean hydrogen and RNG in the natural gas grid	Clean hydrogen and RNG in the natural gas grid

# Low-Carbon Scenarios

<b>Scenario 1</b> <b>In State Constrained</b>	<b>Scenario 2</b> <b>Imports Constrained</b>
Defined in state capacity	Defined imports
Residual demand is met by imports	Residual demand is met by in state generation

# Equity Considerations

# Environmental Justice

"Environmental justice" means **the fair treatment and meaningful involvement of all people** regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, rules, and policies.

Source: [Healthy Environment for All \(HEAL\) Act of 2021](#)

# Environmental Justice

Environmental justice includes **addressing disproportionate environmental and health impacts in all laws, rules, and policies with environmental impacts by prioritizing vulnerable populations and overburdened communities, the equitable distribution of resources and benefits, and eliminating harm.**

Source: [Healthy Environment for All \(HEAL\) Act of 2021](#)



# Just Transition

“Just Transition” is a principle, a process, and a practice. The principle of just transition is that **a healthy economy and a clean environment can and should co-exist**. The process for **achieving this vision** should be a fair one that **should not cost workers or community residents their health, environment, jobs, or economic assets**.

Source: [Just Transition Alliance](#)



# Low-income households

"Low-income" means **household incomes that do not exceed the higher of eighty percent of area median income or two hundred percent of federal poverty level**, adjusted for household size.

Source: [Washington Administrative Code 480-109-060, Definitions](#)

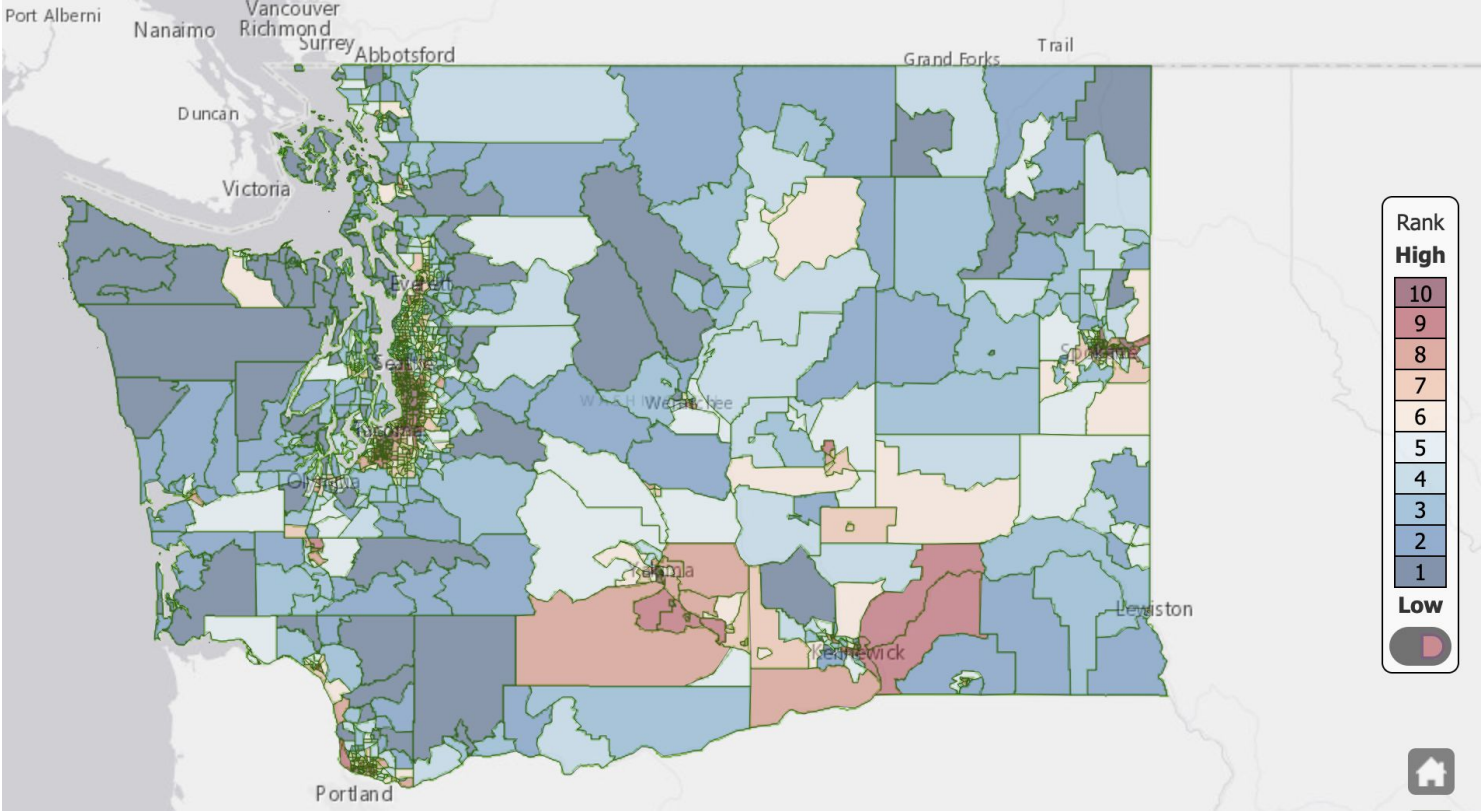
# Highly Impacted Communities

Highly impacted communities meet at least one of the following two criteria:

1. The census tract is covered or partially covered by 'Indian Country' as defined in and designated by [statute](#).
2. The census tract ranks a 9 or 10 on the [Environmental Health Disparities Map](#), as designated by the Department of Health (DOH).

Source: [Washington State Department of Health](#)

# Highly Impacted Communities



# Vulnerable Populations

"Vulnerable populations" means communities that **experience a disproportionate cumulative risk from environmental burdens** due to:

- (i) **Adverse socioeconomic factors**, such as unemployment, high housing and transportation costs relative to income, limited access to nutritious food and adequate health care, and linguistic isolation; and
- (ii) **sensitivity factors**, such as low birth weight and higher rates of hospitalization.

Source: [Washington State Legislature](#)

# Vulnerable Populations

"Vulnerable populations" includes, but is not limited to:

- (i) **Racial or ethnic minorities;**
- (ii) **Low-income** populations;
- (iii) **Populations disproportionately impacted by environmental harms;** and
- (iv) Populations of **workers experiencing environmental harms.**

Source: [Washington State Legislature](#)

# Miro Board Exercise

# Co-benefits and Co-harms



# What are Co-benefits and Co-harms?

- In this analysis, co-benefits or co-harms are assumed to be any benefits or harms additional to the impact on GHG emissions

## Action Co-benefit Criteria

- Synergies: When actions have multiple benefits
- Urgency: A higher degree of urgency in order to avoid loss of inertia on action already taken
- Costs: The cost of early action is generally lower than later action
- Longevity: Related to urgency, the longevity of investment decisions locks society into their effects
- Distribution Effects: Actions have different impacts on different subsets of the population

# Co-benefits and Co-harms

Category	Impact overview	Indicators
<b>1. Health</b>		
1.1 Air quality	Improvement in air quality.	Criteria air contaminants.
1.2 Physical activity	Increased physical activity.	Walking miles traveled; cycling miles traveled by county.
1.3 Noise	Decreased exposure to noise.	Decrease/increase in VMT by county; impact of electric vehicles on noise levels.
1.4 Accessibility	Destinations are more accessible.	Accessibility to destinations and workspaces by active modes or transit.
1.5 Buildings	Indoor air quality is improved.	Number of homes/floor area of workplaces retrofit.

# Co-benefits and Co-harms

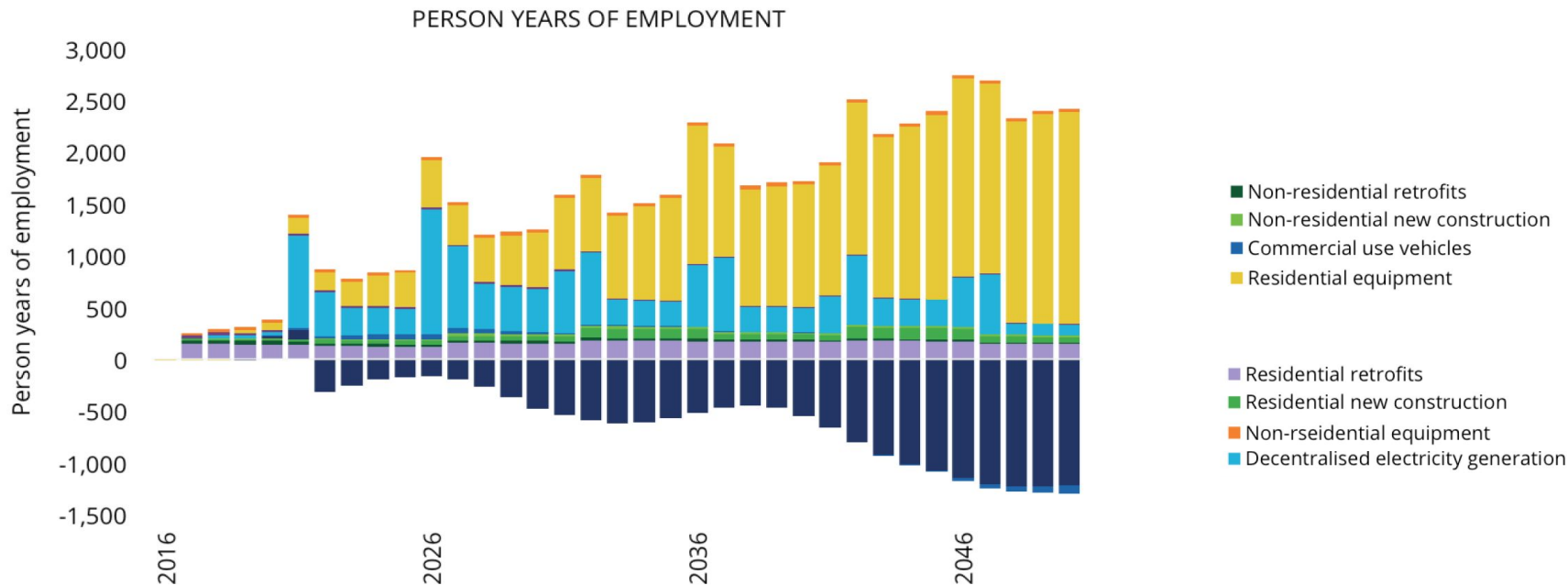
Category	Impact overview	Indicators
<b>2. Economic prosperity</b>		
2.1 Employment	New employment opportunities are created. Existing employment opportunities are lost.	Jobs created/lost by sector and by county.
2.2 Economic development	New economic sectors emerge. Existing sectors are phased out.	Capital expenditures by sector and by county.
2.3 Innovation	Decarbonisation policies will stimulate innovation.	Number of new sectors.
2.4 Reputation	The reputation of the public and private sector is enhanced.	Value of “green” reputation.
2.5 Social capital	Communities are more resilient.	Number of cooperatives or other non-profit organizations formed.
2.6 Natural capital	Green spaces are preserved and enhanced.	Energy sprawl/land area required for energy infrastructure; area of land preserved or restored.

# Co-benefits and Co-harms

Category	Impact overview	Indicators
<b>3. Social equity</b>		
3.1 Poverty	Energy efficiency will reduce household building and transportation costs.	Household energy expenditures.
3.2 Intergenerational equity and resilience	The burden on future generations is decreased. Stranded costs are avoided by acting quickly where possible.	Social cost of carbon.

# GROWTH QUALITY GREEN JOBS

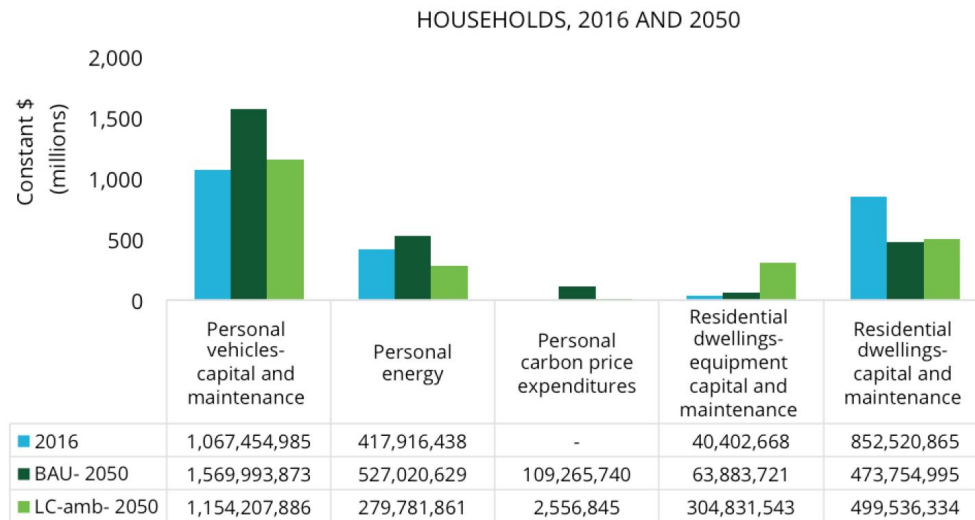
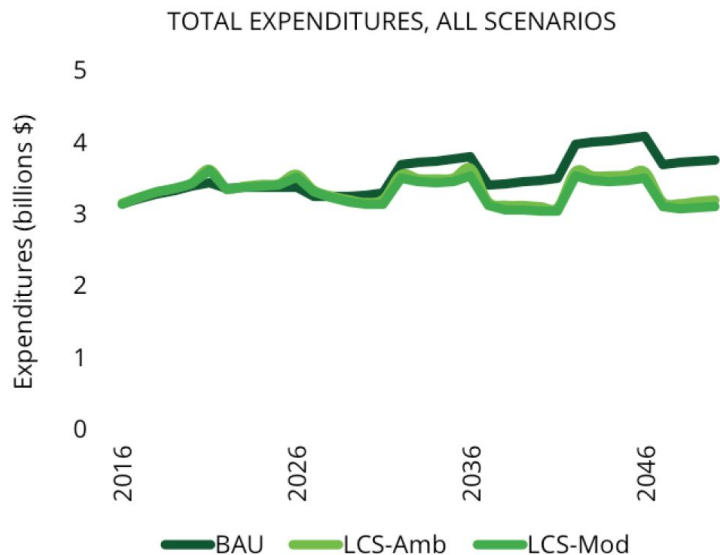
Note: This graph is an example.  
It does not present analysis for  
Washington.



# EQUITY

## LONG-TERM SAVINGS

Note: This graph is an example. It does not present analysis for Washington.

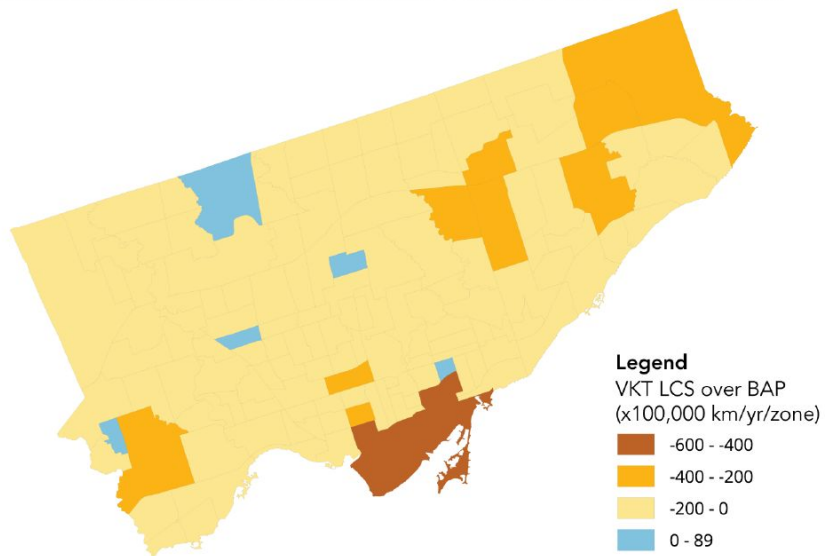


# EQUITY

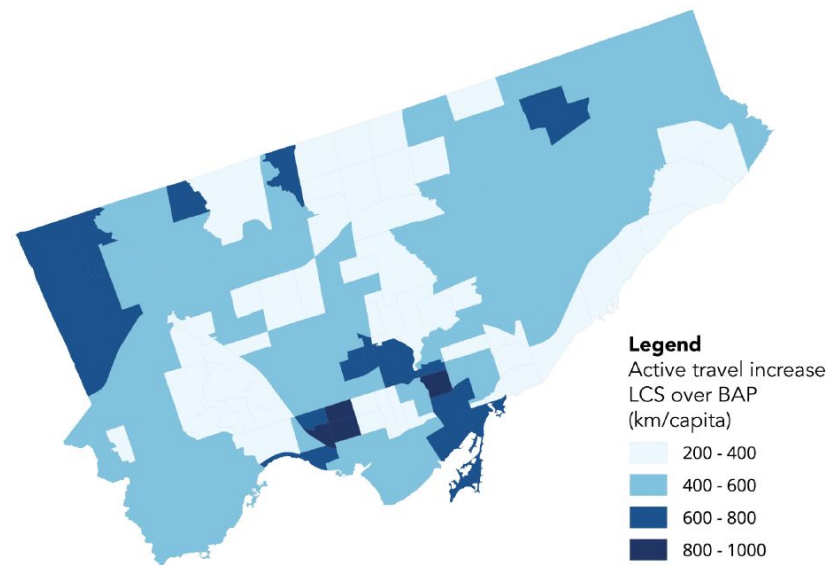
## HEALTH + WELL-BEING

Note: This figure is an example. It does not present analysis for Washington.

CHANGE IN VEHICLE KILOMETERS TRAVELLED (VKT) IN THE CITY OF TORONTO LOW CARBON SCENARIO (LCS) VERSUS BUSINESS AS PLANNED (BAP) SCENARIO, 2050

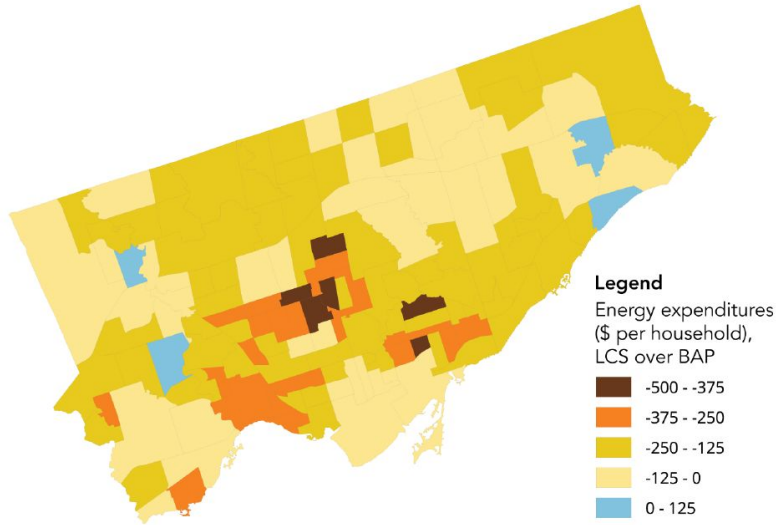


INCREASE IN ACTIVE TRAVEL IN THE CITY OF TORONTO LOW CARBON SCENARIO OVER THE BUSINESS AS PLANNED SCENARIO, 2050



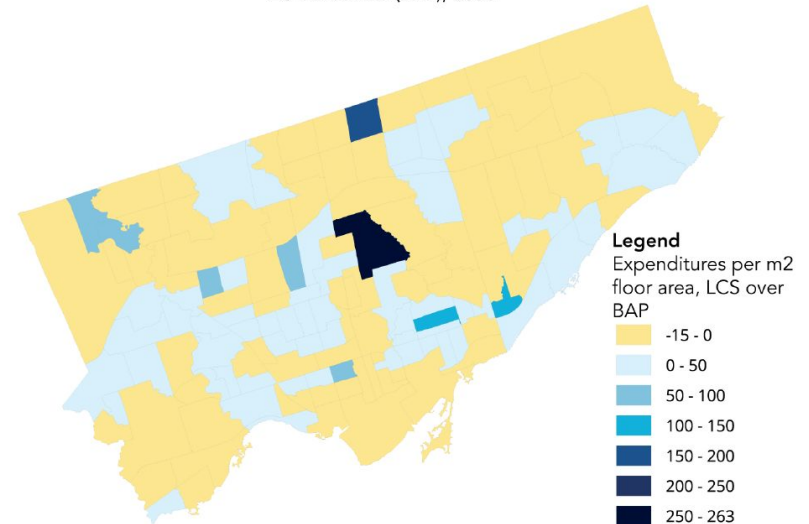
# SUSTAINABILITY AFFORDABILITY

HOUSEHOLD ENERGY EXPENDITURES IN THE CITY OF TORONTO LOW CARBON SCENARIO (LCS) VERSUS BUSINESS AS PLANNED (BAP) SCENARIO, 2050



**Note: This figure is an example. It does not present analysis for Washington.**

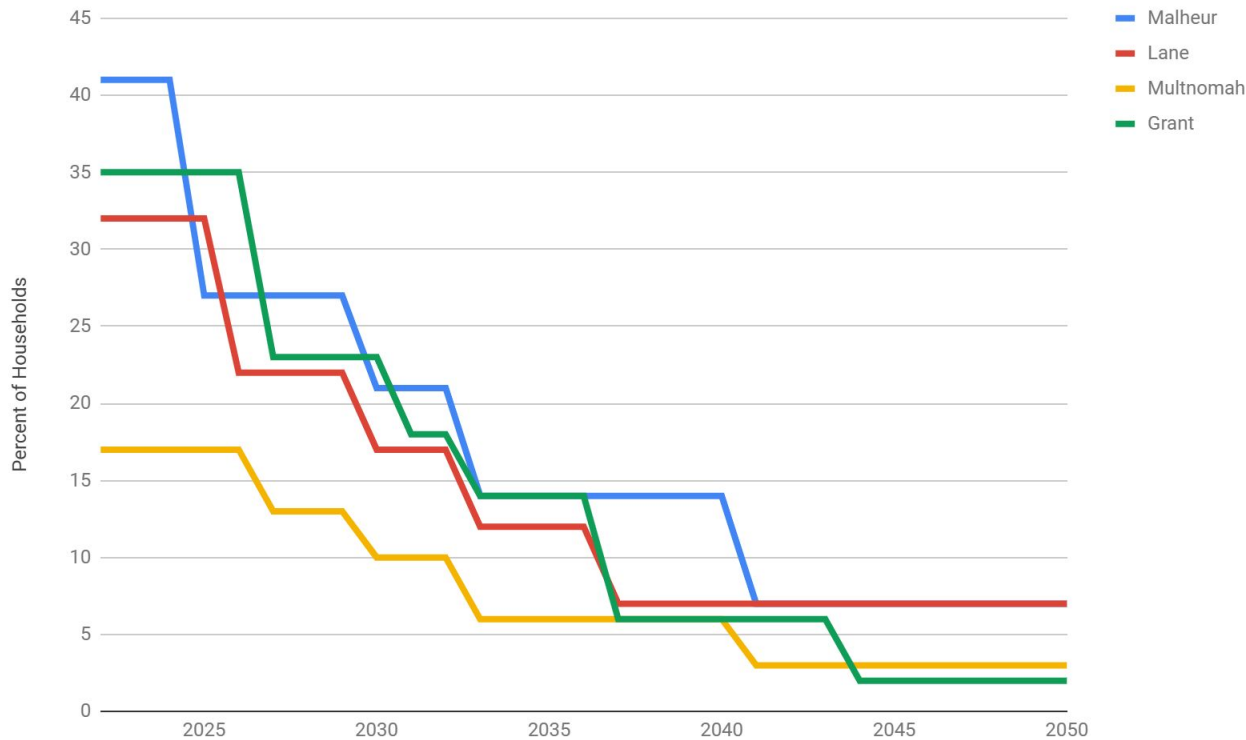
CHANGE IN YEARLY COMMERCIAL/INDUSTRIAL ENERGY EXPENDITURES PER m2 OF FLOORSPACE IN THE CITY OF TORONTO LOW CARBON SCENARIO (LCS) OVER BUSINESS AS PLANNED (BAP), 2050





# ENERGY BURDEN AFFORDABILITY

**Note: This graph is an example. It does not present analysis for Washington.**

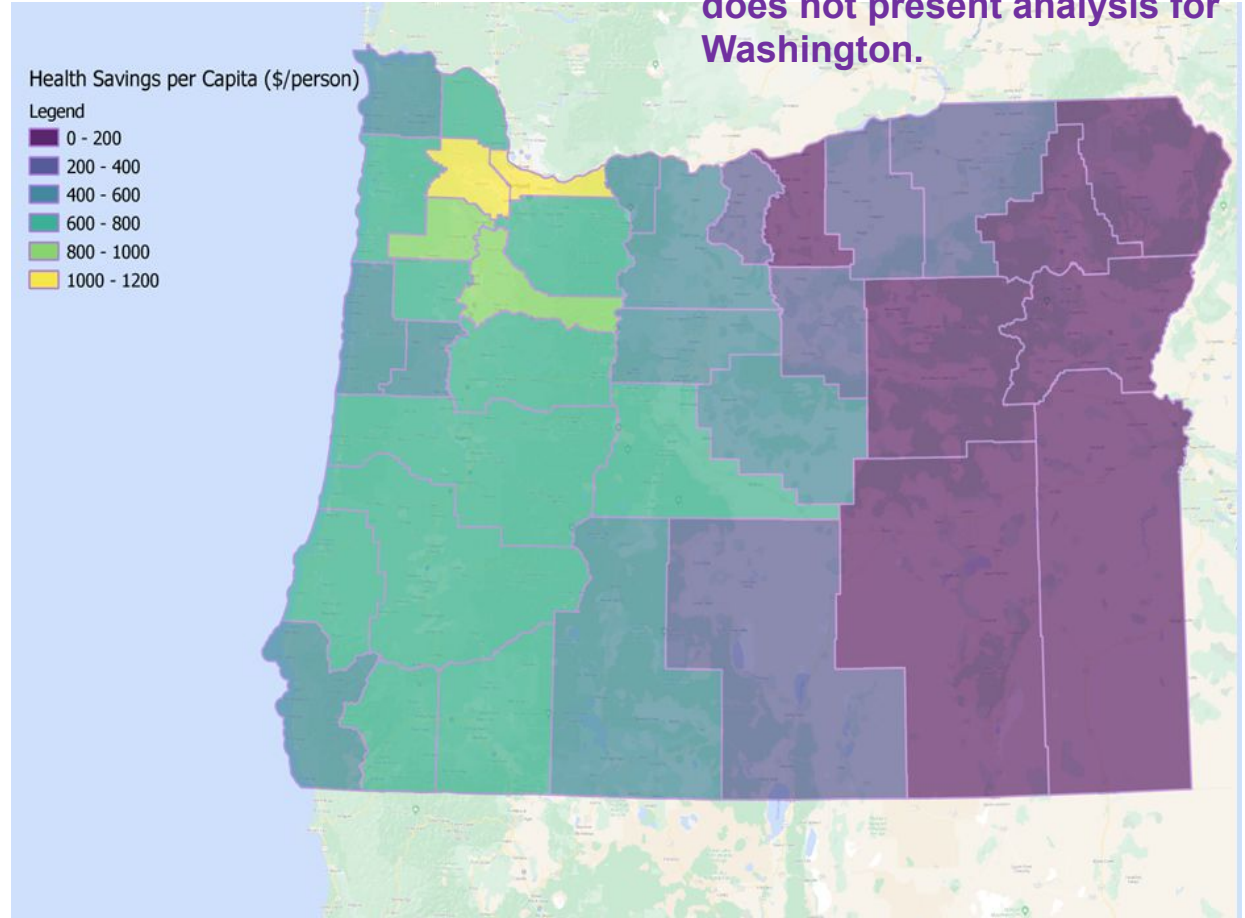


An individual or family is considered energy burdened if they spend 6% or more of their income on energy costs

# HEALTH Air Quality

EPA - Benefits Risk  
Assessment Health  
Impacts Screening  
and Mapping Tool  
(COBRA)

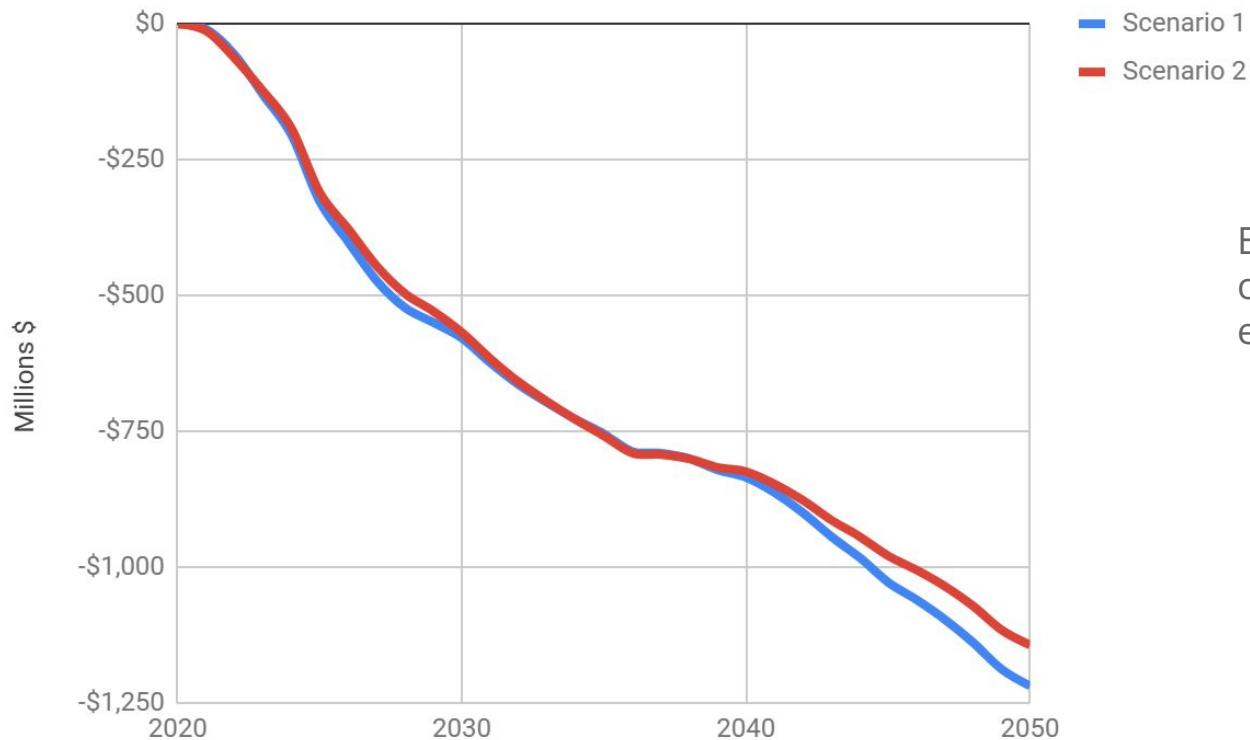
**Note: This map is an example. It  
does not present analysis for  
Washington.**



# SOCIAL COST OF CARBON

## Intergenerational equity and resilience

**Note: This graph is an example. It does not present analysis for Washington.**



Economic Impacts  
of avoided GHG  
emissions

# Co-benefits and Co-harms Q&A

# Feedback Lab

# Appendix

# Miro Board

What does a just transition look like for natural gas decarbonization?



# Common Actions - Both Scenarios

Action	Specification	Which existing policies can support this action	Which new policies can support this action	How might this action affect highly impacted and vulnerable communities
Increase density of development in urban zones	Fraction of single new builds to be reduced to 25% of new buildings in counties with high urban density by 2040, decrease in personal use vehicle miles travelled			
Deep retrofits in the building stock	Retrofit 95% of existing buildings by 2040 to achieve a 50% reduction in space heating/cooling and a 40% reduction other non water heating energy use			
Increase transit ridership	Triple transit ridership in urban centers by 2040			
Decrease freight vehicle miles travelled	Decrease vehicle miles travelled by 15% by 2050			

# Common Actions - Both Scenarios

Action	Specification	Which existing policies can support this action	Which new policies can support this action	How might this action affect highly impacted and vulnerable communities
Mode Shift to cycling	Transfer 10% of personal use vehicle trips to electric micro-mobility (e.g., e-bike/e-scooter) in urban counties by 2035			
Efficiency improvements in industry	Improve the energy efficiency of industrial facilities to achieve a 50% reduction in energy use by 2050			
Marine passenger electrification	Passenger ferries 100% electric by 2040			

# Electrification - Demand Side Actions

Action	Specification	Which existing policies can support this action	Which new policies can support this action	How might this action affect highly impacted and vulnerable communities
Heat pumps residential space conditioning	95% of new sales for existing buildings are electric heat pumps by 2040			
Heat pumps residential water heating	95% of new sales for existing buildings are electric heat pumps by 2040			
Heat pumps commercial space conditioning	95% of new sales for existing buildings are electric heat pumps by 2040			
Heat pumps commercial water heating	50% of new sales for existing buildings are electric heat pumps by 2040			

# Electrification - Demand Side Actions

Action	Specification	Which existing policies can support this action	Which new policies can support this action	How might this action affect highly impacted and vulnerable communities
Zero emission commercial use vehicles	Percentage of new sales by 2035 - 100% Classes 2b-3 trucks electric (vans, medium pickup trucks) - 90% Classes 4-8 trucks electric (delivery trucks, delivery/service vans, lighter truck tractors, bucket trucks) - 80% Class 8 truck tractors electric			
Electrification of some industrial processes	Deploy electricity in industries - replace 55% fossil fuels with electricity by 2050			
Enable distributed energy resources	20 TWh of rooftop solar PV generation by 2035			
Enhance energy storage	Add storage capability to 25% of residential non-apartment building stock by 2035, assume each storage unit is specified to 14 kWh			

# Alternative Fuels - Demand Side Actions

Action	Specification	Which existing policies can support this action	Which new policies can support this action	How might this action affect highly impacted and vulnerable communities
Heat pumps in residential space conditioning	95% of new sales for existing buildings are electric & natural gas heat pumps by 2040			
Heat pumps in residential water heating	95% of new sales for existing buildings are electric & natural gas heat pumps by 2040			
Heat pumps commercial space conditioning	95% of new sales for existing buildings are electric and natural gas heat pumps by 2040			
Heat pumps commercial water heating	50% of new sales for existing buildings are electric and natural gas heat pumps by 2040			
Adoption of hydrogen into residential homes	Deploy clean hydrogen fuel cells for homes - 5% of homes will have hydrogen fuel cell by 2030			

# Alternative Fuels - Demand Side Actions

Action	Specification	Which existing policies can support this action	Which new policies can support this action	How might this action affect highly impacted and vulnerable communities
Zero emission commercial use vehicles	<p>Percentage of new sales by 2035</p> <ul style="list-style-type: none"> <li>- 100% Classes 2b-3 trucks - <b>80% EV, 20% ZEV</b> (vans, medium pickup trucks)</li> <li>- 90% Classes 4-8 trucks - <b>50% EV, 50% ZEV</b> (delivery trucks, delivery/service vans, lighter truck tractors, bucket trucks)</li> <li>- 80% Class 8 truck tractors - <b>20% EV, 80% ZEV</b></li> </ul>			
Hydrogen and RNG into industrial processes	Deploy green hydrogen and RNG in industries - 70% Hydrogen/RNG adoption by 2050			
Clean hydrogen in the natural gas grid	New round of standards for appliances and equipment beyond those codified in 2021 - 15% hydrogen injected into the natural gas distribution system by 2035			
RNG in the natural gas grid	Use full RNG potential of 87.5 tBTU by 2050			

# Alternative Fuels - Demand Side Actions

Action	Specification	Which existing policies can support this action	Which new policies can support this action	How might this action affect highly impacted and vulnerable communities
In-state production of RNG	Produce sufficient RNG to provide 6% of RNG demand within the state by 2050			
In-state production of clean hydrogen	Produce sufficient hydrogen to provide 50% of hydrogen demand within the state			

# Hybrid - Demand Side Actions

Action	Specification	Which existing policies can support this action	Which new policies can support this action	How might this action affect highly impacted and vulnerable communities
Heat pumps residential space conditioning	95% of new sales for existing buildings are electric heat pumps by 2040			
Heat pumps residential water heating	95% of new sales for existing buildings are electric heat pumps by 2040			
Heat pumps commercial space conditioning	95% of new sales for existing buildings are electric heat pumps by 2040			
Heat pumps commercial water heating	50% of new sales for existing buildings are electric heat pumps by 2040			
Zero emission commercial use vehicles	Percentage of new sales by 2035 - 100% Classes 2b–3 trucks - <b>80% EV, 20% ZEV</b> (vans, medium pickup trucks) - 90% Classes 4–8 trucks - <b>50% EV, 50% ZEV</b> (delivery trucks, delivery/service vans, lighter truck tractors, bucket trucks) - 80% Class 8 truck tractors - <b>20% EV, 80% ZEV</b>			



# Hybrid - Demand Side Actions

Action	Specification	Which existing policies can support this action	Which new policies can support this action	How might this action affect highly impacted and vulnerable communities
Hydrogen and RNG into industrial processes	Deploy green hydrogen and RNG in industries - 70% Hydrogen/RNG adoption by 2050			
Enable distributed energy resources	20 TWh of rooftop solar PV generation by 2035			
Enhance energy storage	Add storage capability to 25% of residential non-apartment building stock by 2035, assume each storage unit is specified to 14 kWh			
Clean hydrogen in the natural gas grid	New round of standards for appliances and equipment beyond those codified in 2021 - 15% hydrogen injected into the natural gas distribution system by 2035			
RNG in the natural gas grid	Use full RNG potential of 87.5 tBTU by 2050			
In-state production of RNG	Produce sufficient RNG to provide 6% of RNG demand within the state			
In-state production of clean hydrogen	Produce sufficient hydrogen to provide 50% of hydrogen demand within the state			

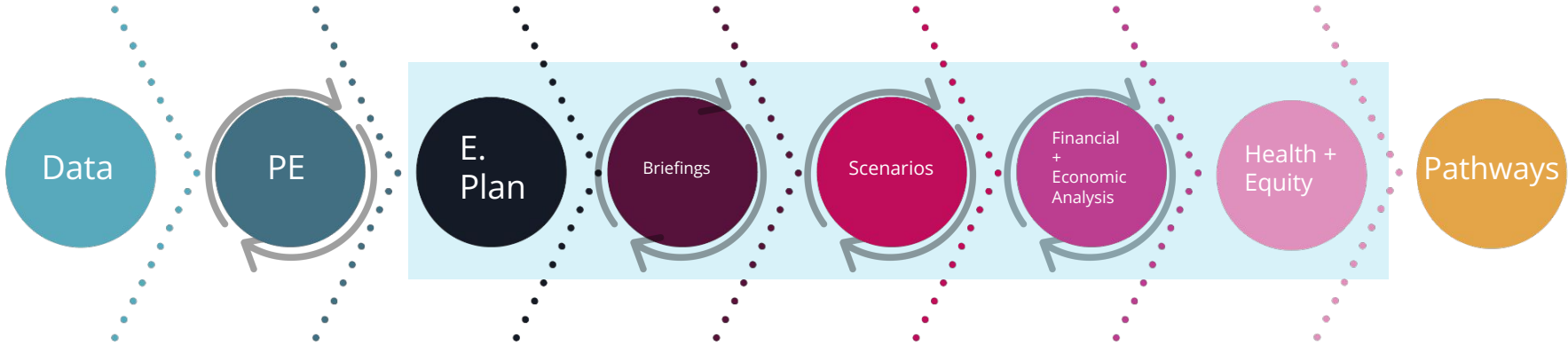
# Supply Side


Resource	Which existing policies can support this action?	Which new policies could support this action?	How might this action affect highly impacted and vulnerable communities?
Solar			
Wind			
Hydro			
Geothermal			
Energy Storage			
Hydrogen			
RNG			
Nuclear			
Bioenergy			

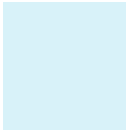
# Engagement Review

**SSG**

# Engagement in Climate Action Planning



 Iteration + Adaptive Management


 Active Engagement Period

# Engagement Approach

- Overall project will be set **involve/collaborate** (see next slide) for influence on the decision.
- We will ensure a transparent and accessible engagement process.
- We will use diverse techniques to effectively reach diverse stakeholders across the state.
- We will gather input on the social, economic, and equity impacts of decarbonization actions.
- We will design engagements to facilitate collaboration, rather than polarization.

# IAP2 Spectrum of Public Participation

IAP2's Spectrum of Public Participation was designed to assist with the selection of the level of participation that defines the public's role in any public participation process. The Spectrum is used internationally, and it is found in public participation plans around the world.

INCREASING IMPACT ON THE DECISION 					
	<b>INFORM</b>	<b>CONSULT</b>	<b>INVOLVE</b>	<b>COLLABORATE</b>	<b>EMPOWER</b>
<b>PUBLIC PARTICIPATION GOAL</b>	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
<b>PROMISE TO THE PUBLIC</b>	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.