

# Mitigation options for BC's forest sector

**Carolyn Smyth**

**Part 1**: Options and their mitigation potential

**Zach Xu**

**Part 2**: Costs and socio-economic impacts of implementing options



**Canada**

Natural Resources  
Canada

Ressources naturelles  
Canada

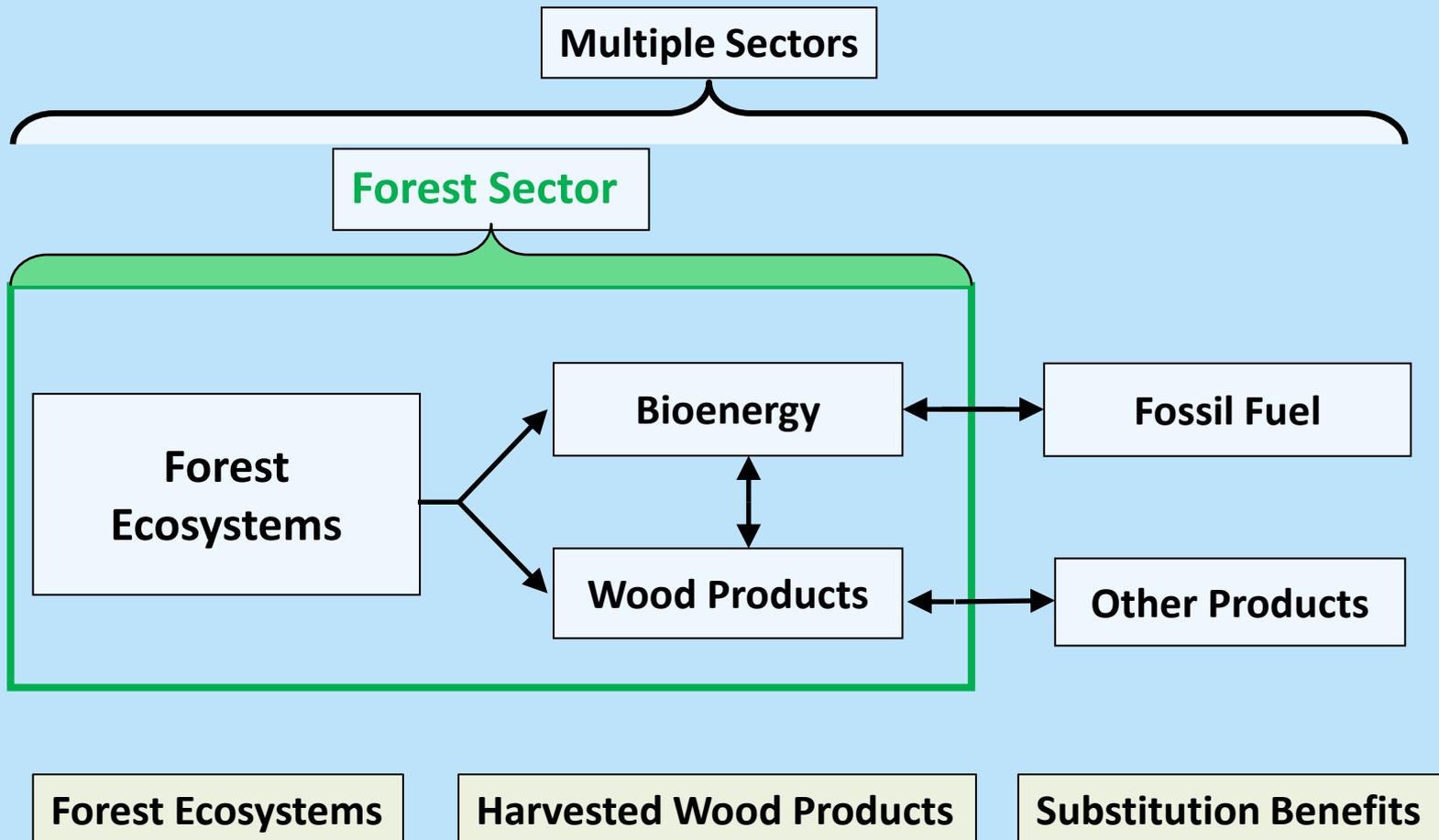


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**Vancouver - PICS Public and Media Event - May 25<sup>th</sup>, 2017**

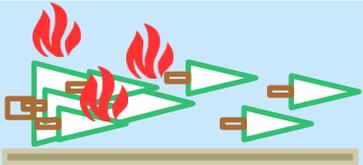
# Climate Change Mitigation

Design of climate change mitigation portfolios in the forest sector should be based on systems approach that accounts for Carbon in **forest ecosystems**, Carbon in **Harvested Wood Products**, and **substitution benefits**, relative to a baseline

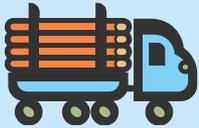


# Mitigation Options

## BASELINE



Decay- Slashburning



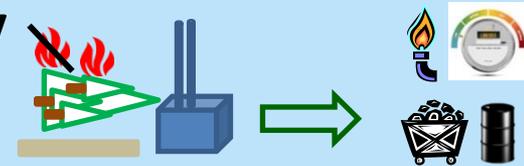
## A. Higher Utilization

- Increase capture of stemwood by 5%
- Less harvesting waste
- Increase salvage harvest



## B. Harvest Residues for Bioenergy

- Capture up to 25% of harvest residue
- Reduce slashburning

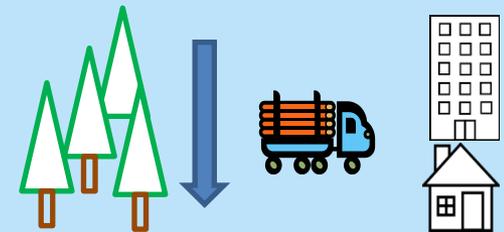


## C. Higher Utilization + Bioenergy

- Combine A and B

## D. Harvest Less

- Reduce harvest by 2%

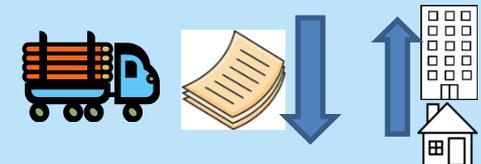


## E. Restricted Harvest

- No harvest of stands older than 250 years

## F. More Longer-Lived Products (LLP)

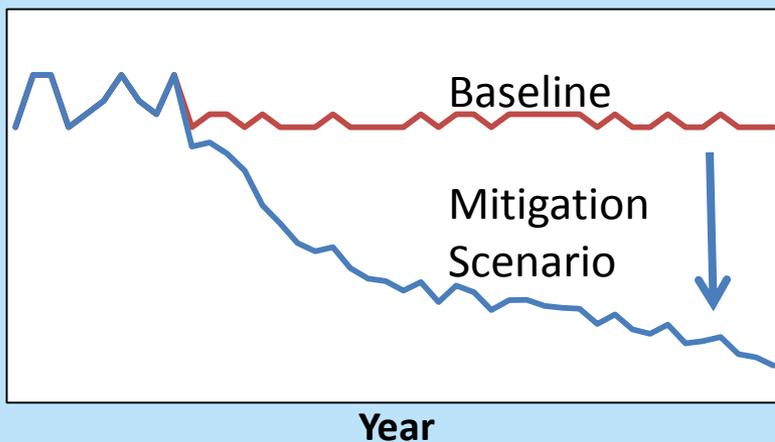
- Shift from pulp and paper to panels (4% shift)



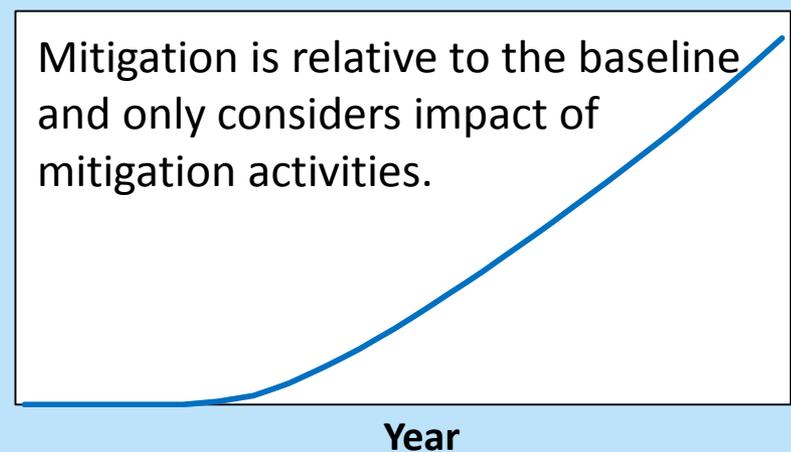
# Mitigation Results

- At this stage in the process, we're providing information on assumptions and results and looking for feedback.
- There are limitations to the current model runs and additional model runs are needed.
- These scenarios are the first step toward a better understanding of climate change mitigation options in BC's forest sector. They do not provide, at this stage, a complete scientific foundation for policy development.

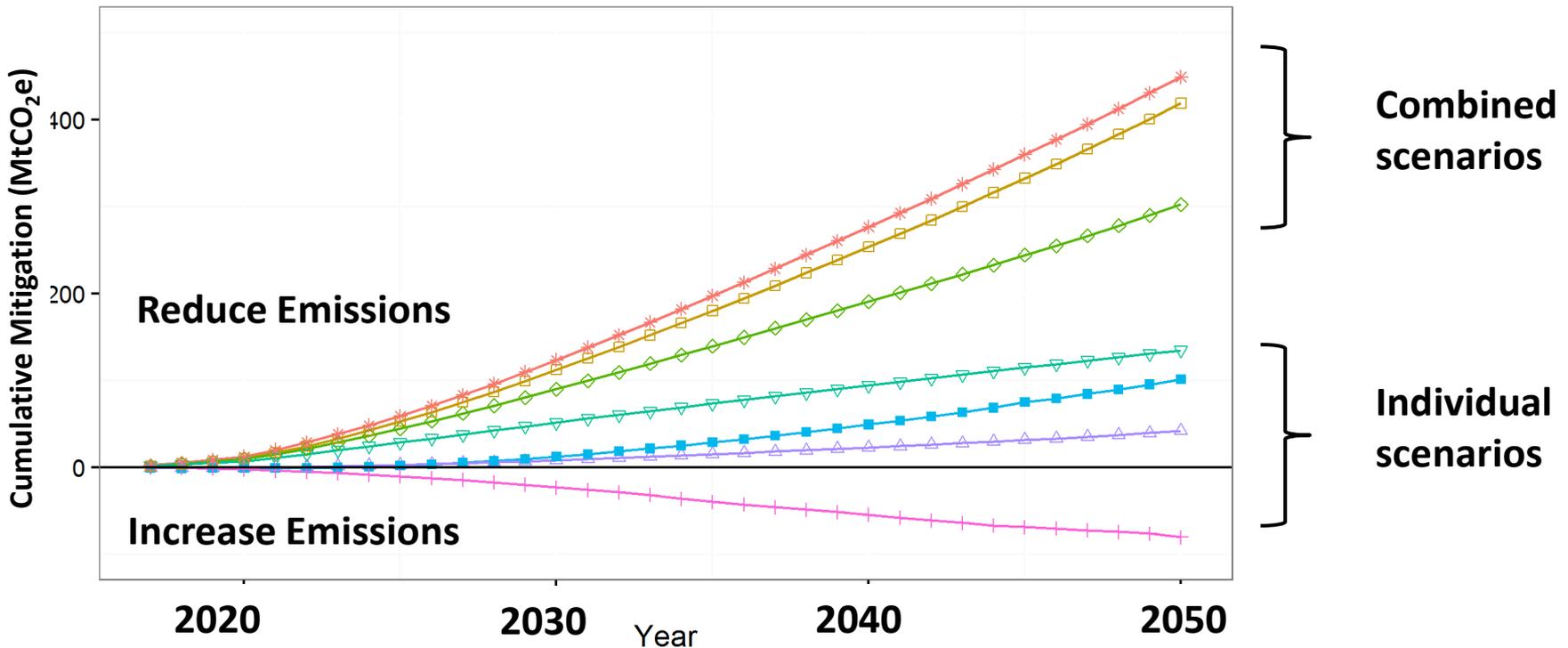
## Annual Emission Reduction



## Cumulative Mitigation

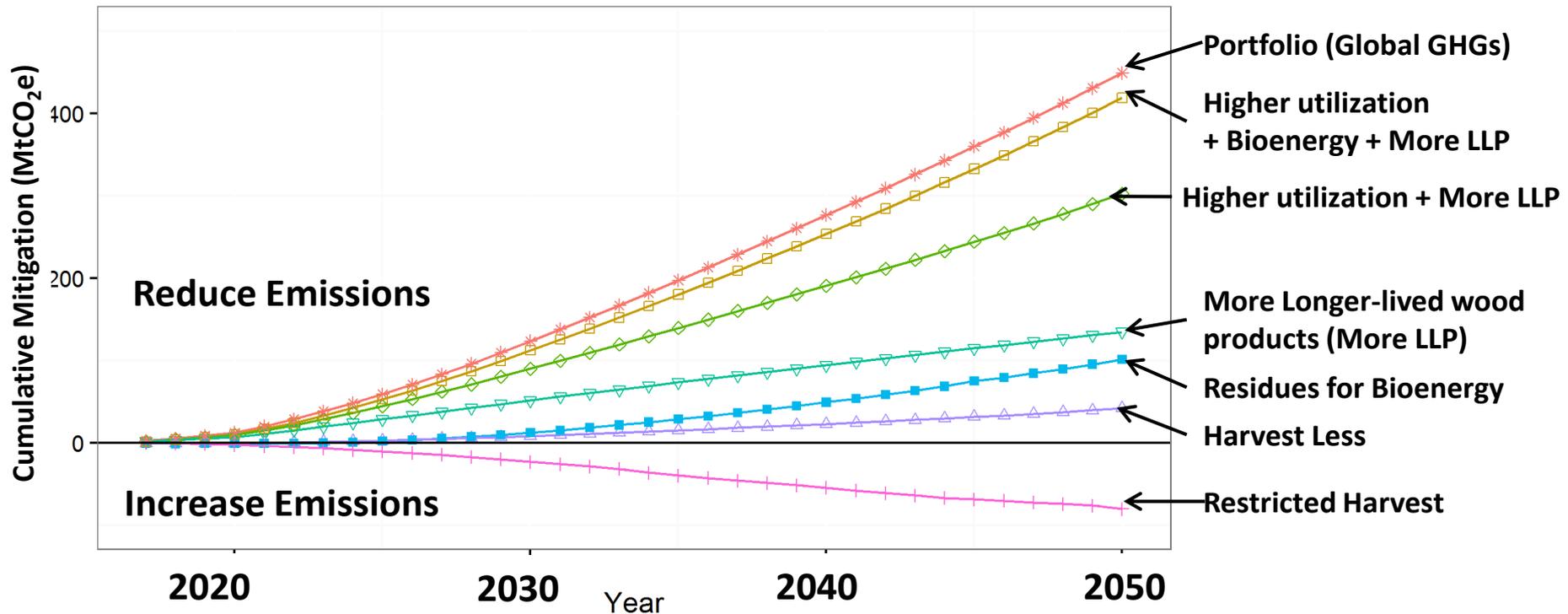


# Change in GHG Emissions



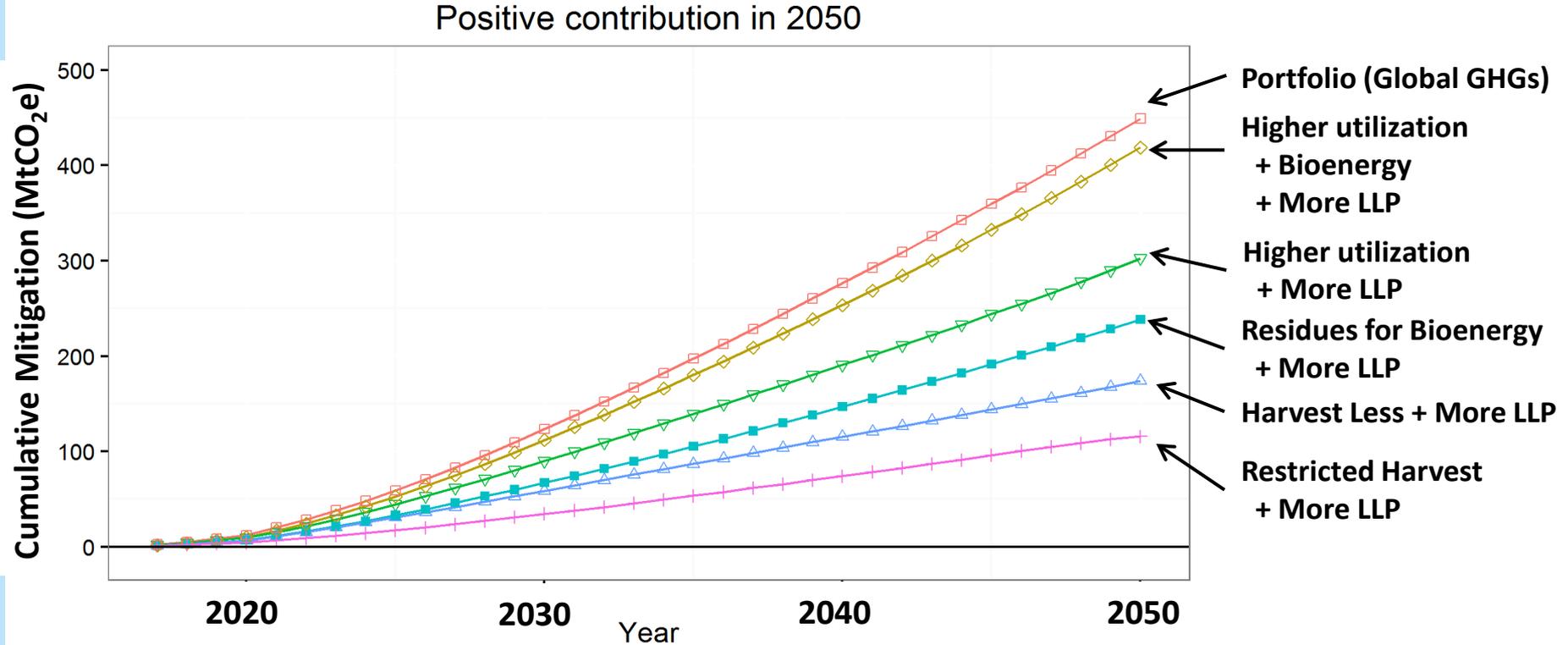
- **Wide range** of climate change **mitigation potential**, depending on the strategy considered.
- **Some strategies** have **negative mitigation potential** (increase in GHG emissions) in **some regions**. The graph shows the result of applying scenarios across BC regardless of their outcome.

# Change in GHG Emissions



- **Wide range** of climate change **mitigation potential**, depending on the strategy considered.
- **Some strategies** have **negative mitigation potential** (increase in GHG emissions) in **some regions**. The graph shows the result of applying scenarios across BC regardless of their outcome.

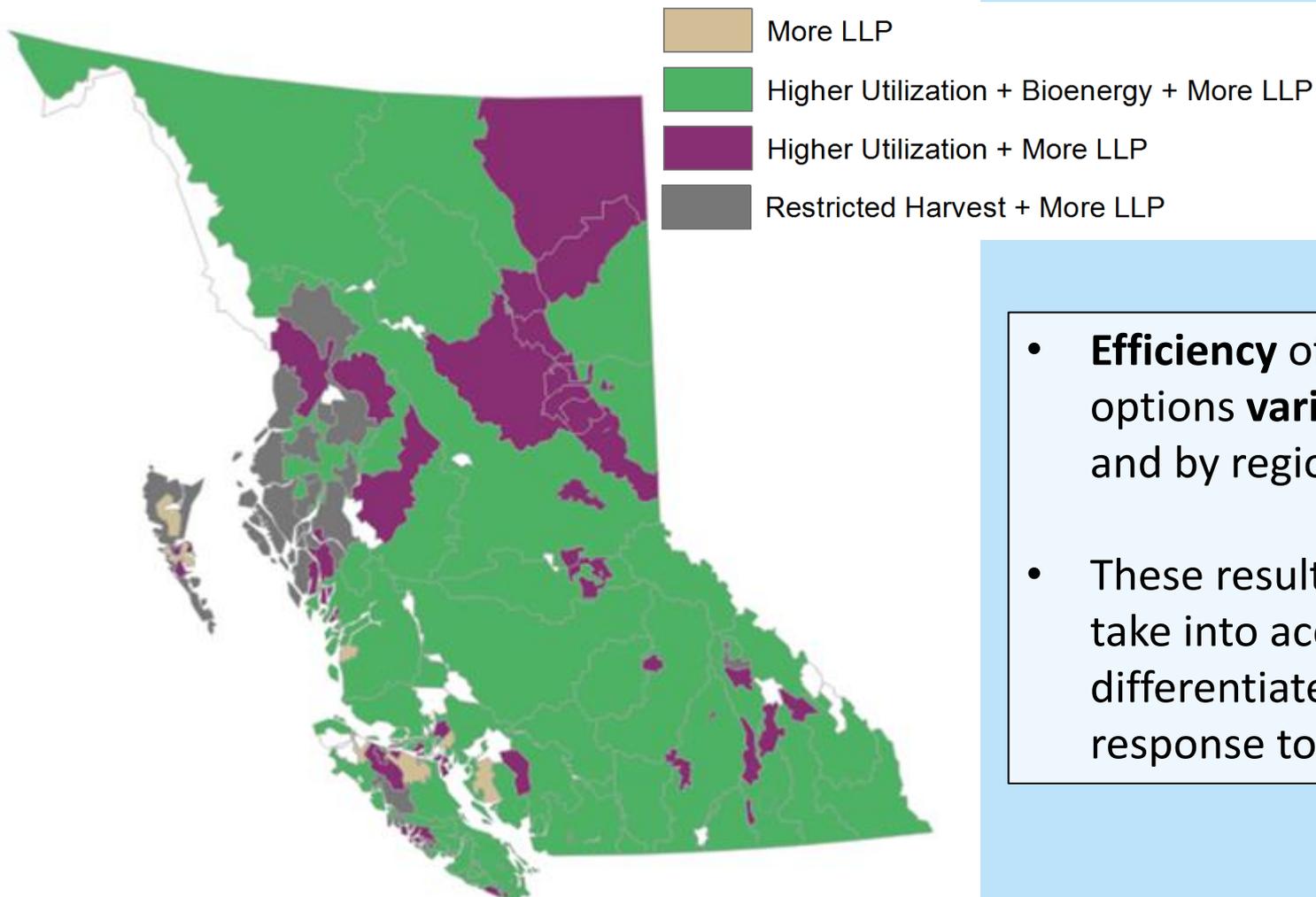
# Reduction in GHG emissions



- Developing a **portfolio of activities** or combinations of activities **maximizes mitigation**.
- The **maximum cumulative mitigation potential** was **449 MtCO<sub>2</sub>e** in 2050 of the scenarios analyzed.

# Portfolio - BC Mitigation Potential

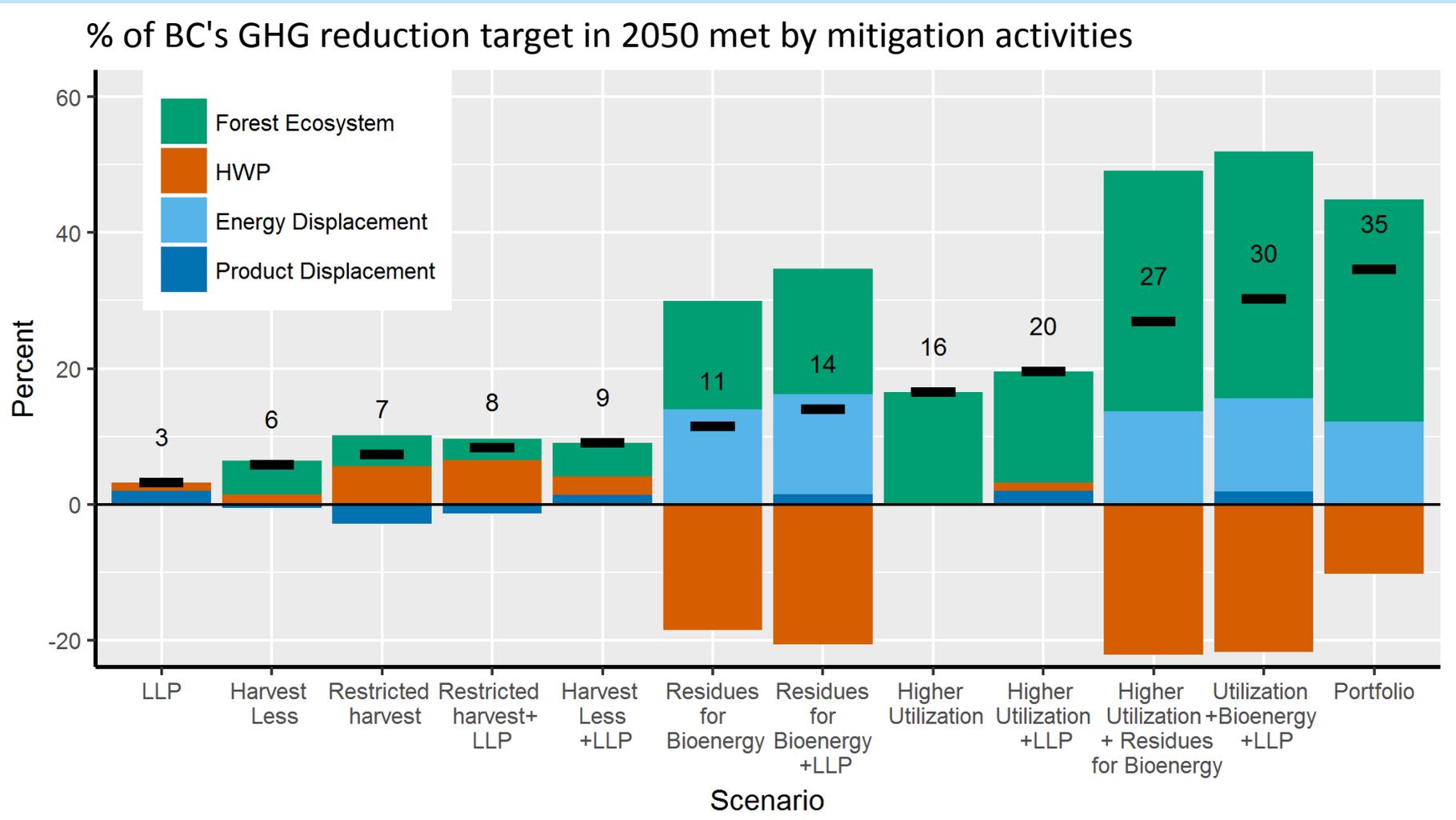
BC mitigation potential - *Excludes substitution impacts outside BC*



- **Efficiency** of mitigation options **varies** by activity and by region.
- These results do not yet take into account regionally differentiated forest response to climate change.

# Contribution to 2050 target

BC's GHG reduction target is 80% below 2007 level of 65.89 MtCO<sub>2</sub>e

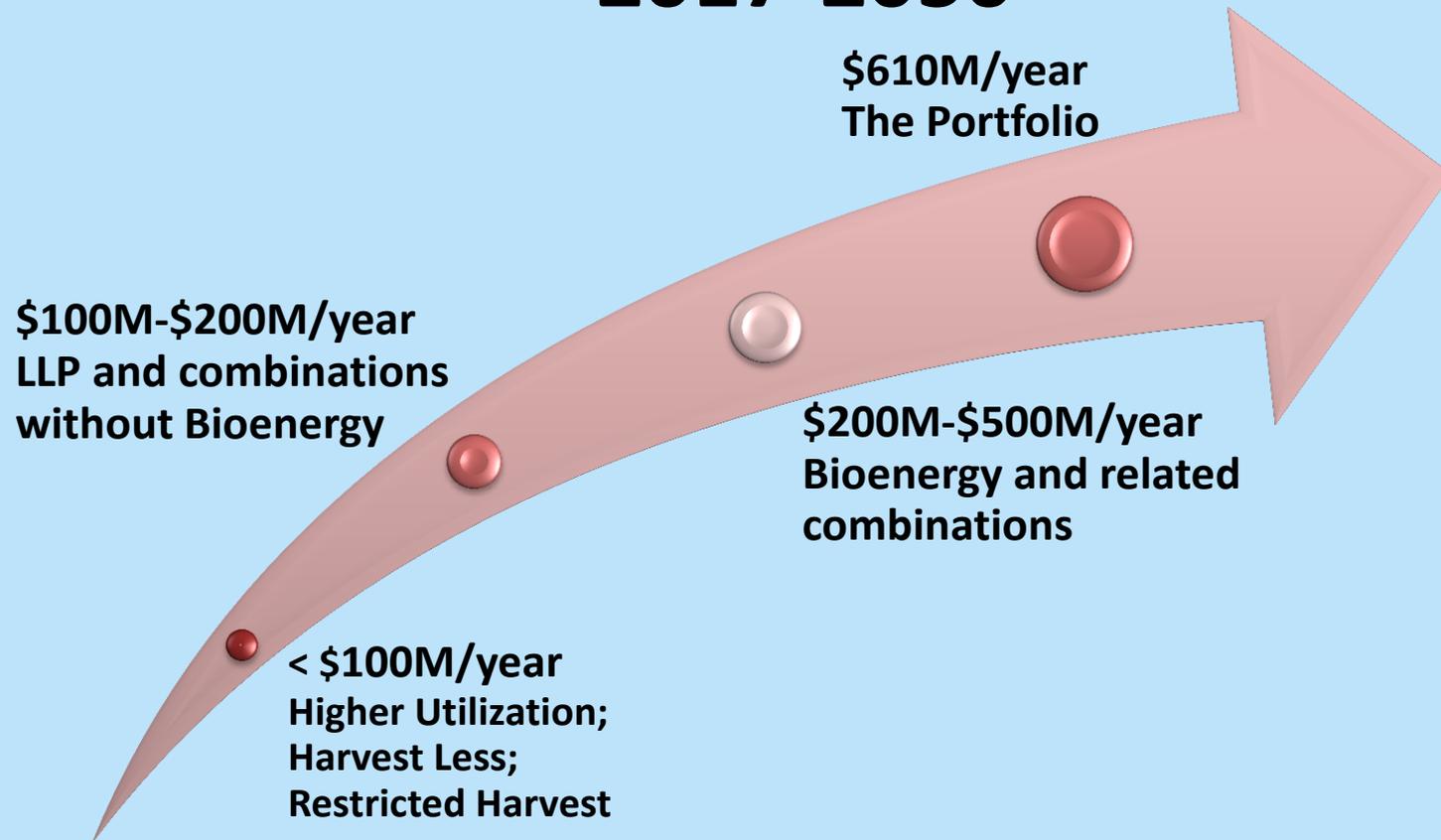


## **Part 2:**

Costs and socio-economic impacts of  
implementing options

**Zach Xu**

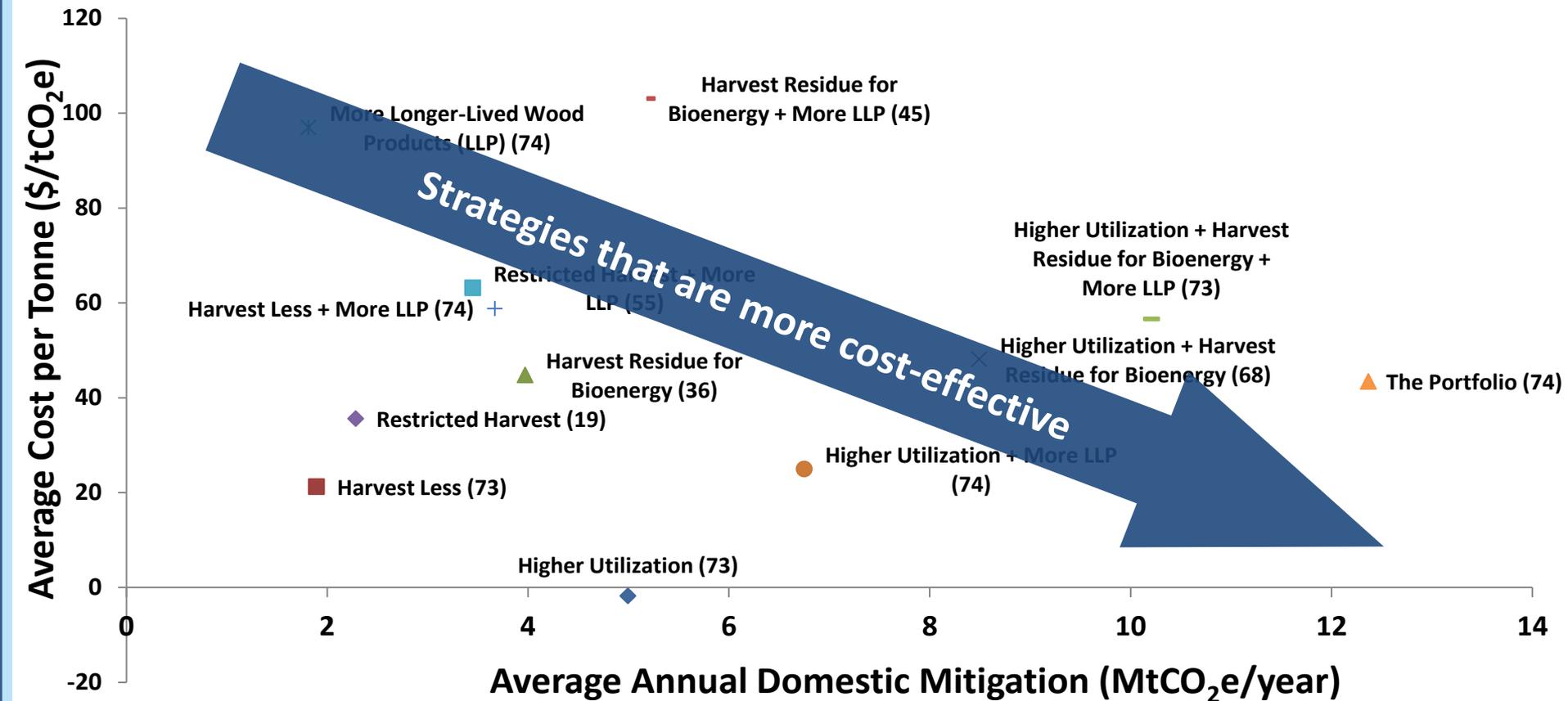
# Annual Averages of Total Mitigation Costs 2017-2050



Total **Mitigation Cost** is the **change** in total **Net Revenue** of relevant industries in BC

- The portfolio shows the highest cost.
- Strategies involving bioenergy result in higher total cost than the others

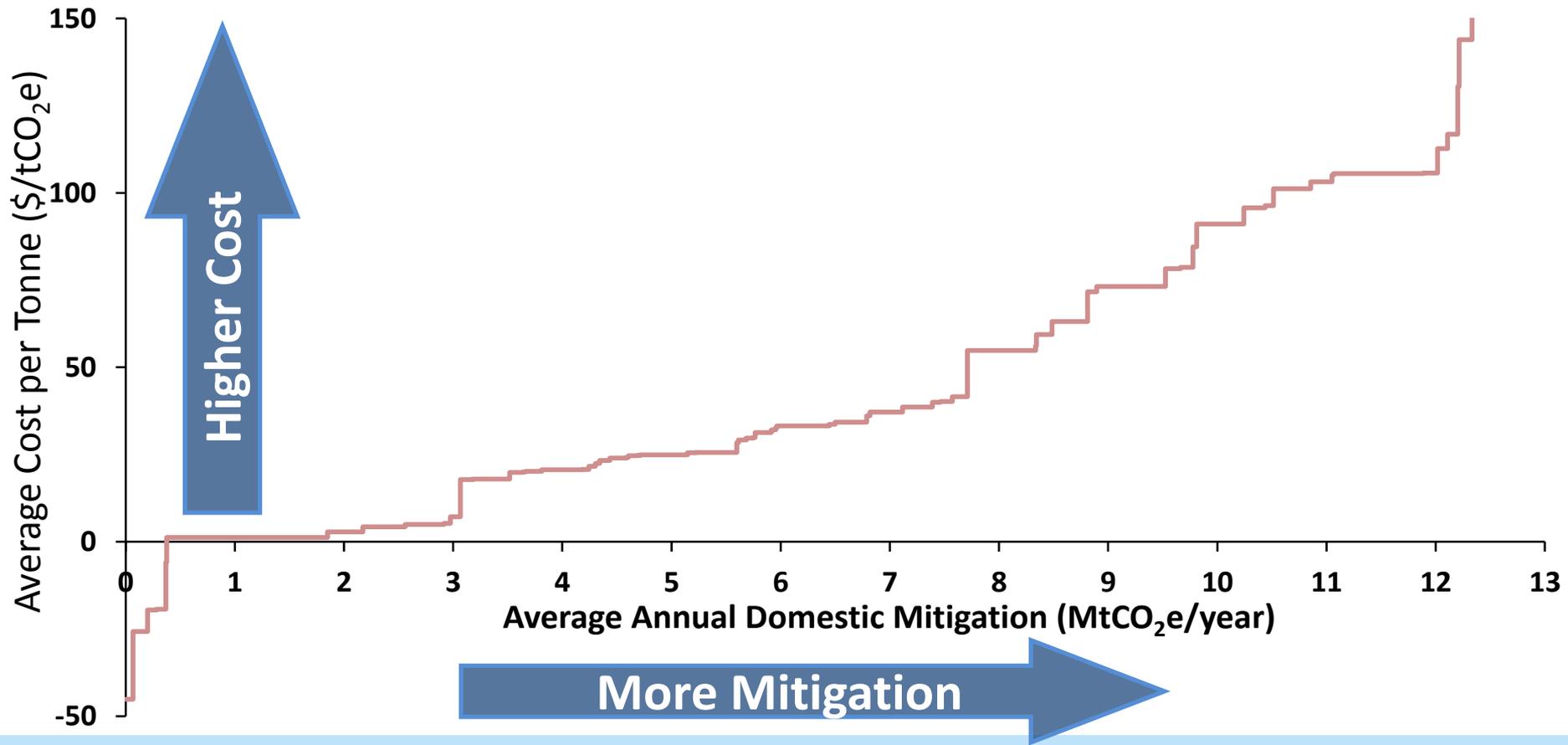
# Annual Domestic Mitigation and Average Cost per Tonne



The cost per tonne is total mitigation cost divided by domestic mitigation impact

- In general, the **portfolio and strategy combinations** are **more cost-effective** than individual strategies

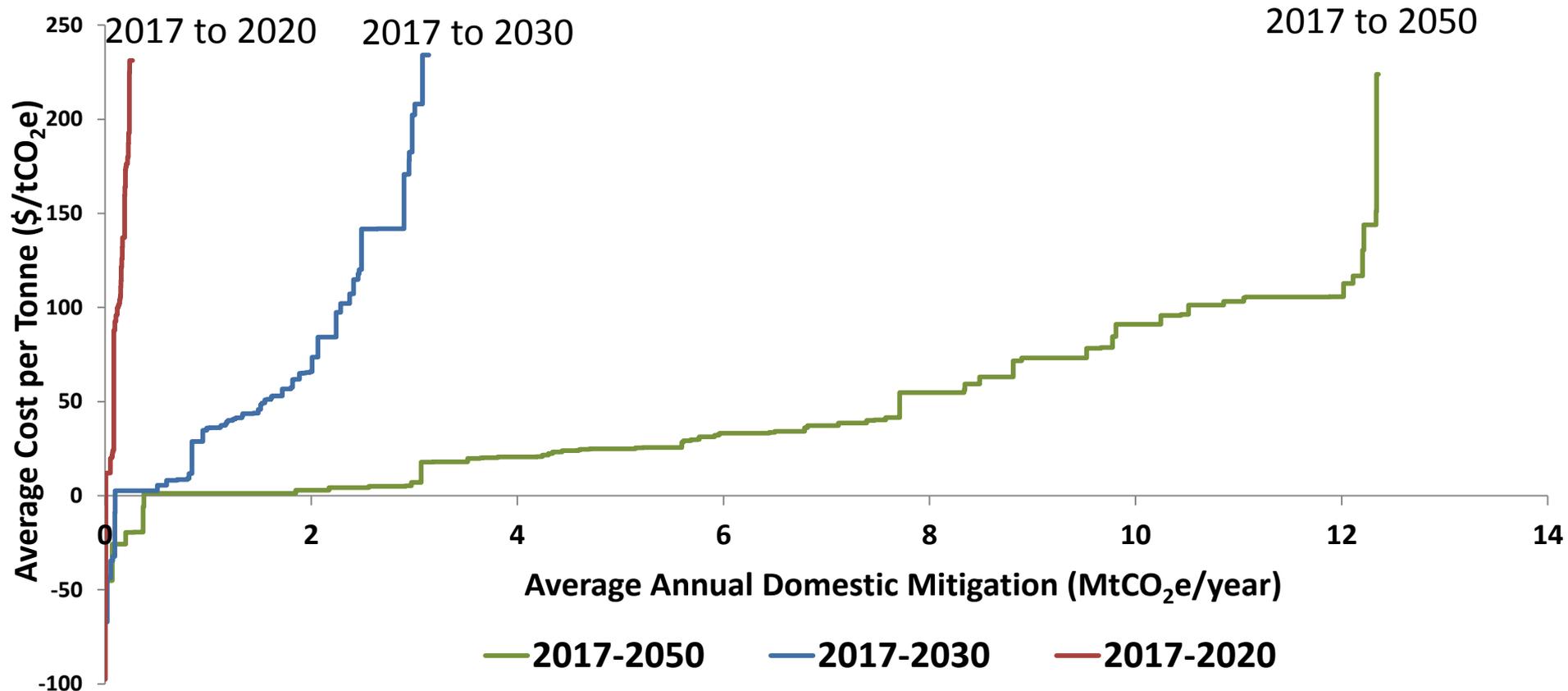
# Cost Curve for the Domestic Portfolio (2017-2050)



The cost curve for the portfolio ranks potential mitigation from the best strategy for each of the spatial units in the portfolio from lowest to highest cost per tonne values

- More than **12 MtCO<sub>2</sub>e** would be achieved per year on average at a cost of up to **\$150/tCO<sub>2</sub>e**, and **85%** of which can be achieved with less than **\$100/tCO<sub>2</sub>e**

# Cost Curves for the Portfolio with Different Time Periods



- With the same portfolio, much **more mitigation** can be achieved at the same cost level **in the long term** than in the short/mid term

# Socio-Economic Impacts

**What:** measuring the impacts of mitigation strategies/portfolios on:

- Employment
- Gross Domestic Product (GDP)
- Government Tax Revenue

**Why:** describing the impact of mitigation strategies on BC's economy as a whole – a necessary complement to assessment of mitigation costs for policy makers

**How:** using multipliers in the Input-Output Model (2010) from Statistics Canada based on the implementation of a strategy during 2017-2050 in selected spatial units

**Key message:** by implementing the domestic portfolio during 2017-2050, BC's forest sector would create more than 2,000 new jobs (full time equivalent), \$284M per year for GDP, and \$34M per year for government tax revenue (for all government levels) on average.

# Key messages

- ☑ Design of climate change **Mitigation Portfolios** in the forest sector should be based on **Systems Approach** that accounts for Carbon in forest ecosystems, Carbon in Harvested Wood Products, and substitution benefits, relative to a baseline
- ☑ **Efficiency** of mitigation options **varies by Activities and by Region**. Developing a portfolio of activities or combinations of activities maximizes mitigation. Ranking of mitigation options can change over time; evaluate both short- and long-term costs and benefits
- ☑ Forest managers do not control use of wood – **Effective Mitigation Portfolios** need to **integrate Forest Management** with wood use strategies
- ☑ **Portfolios** or combinations of strategies can achieve **more mitigation at a lower cost** level than individual strategies and mitigation investments are much **more cost-effective in the long term** than in the short term.

# Key messages (cont'd)

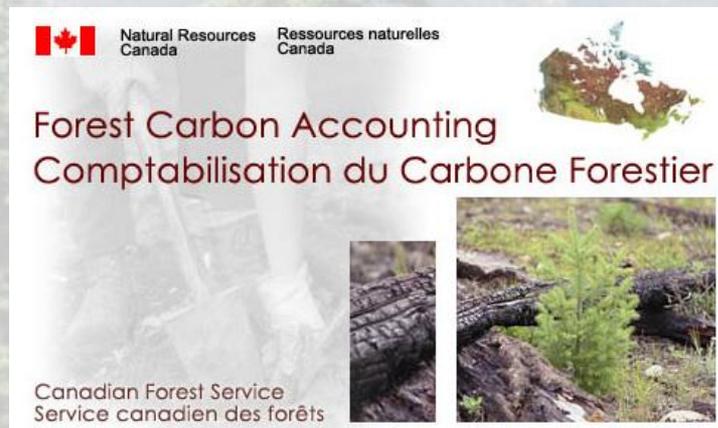
- ☑ **Forest sector mitigation could contribute more than one third to BC's 2050 GHG emission reduction target** at costs of less than \$100/tCO<sub>2</sub>e
- ☑ By maximizing long term domestic mitigation, the **domestic mitigation** would also be able to **create significant amount of new jobs, GDP, and government tax revenue**
- ☑ All scenarios analyzed to date are very conservative. **Actual mitigation potential may be substantially higher**, but implementation barriers and costs may result in lower mitigation potential.

# Thank you

Carolyn Smyth and Zach Xu

[Carolyn.Smyth@canada.ca](mailto:Carolyn.Smyth@canada.ca)

[Zach.Xu@gov.bc.ca](mailto:Zach.Xu@gov.bc.ca)



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<http://www.nrcan.gc.ca/forests/climate-change/carbon-accounting/13087>

<http://pics.uvic.ca/forest-carbon-management-project-potential-contribution-british-columbia%E2%80%99s-forest-sector-greenhouse>