

Mitigation options for BC's forest sector

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Part 1: Options and their mitigation potential

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



Canada

Natural Resources
Canada

Ressources naturelles
Canada

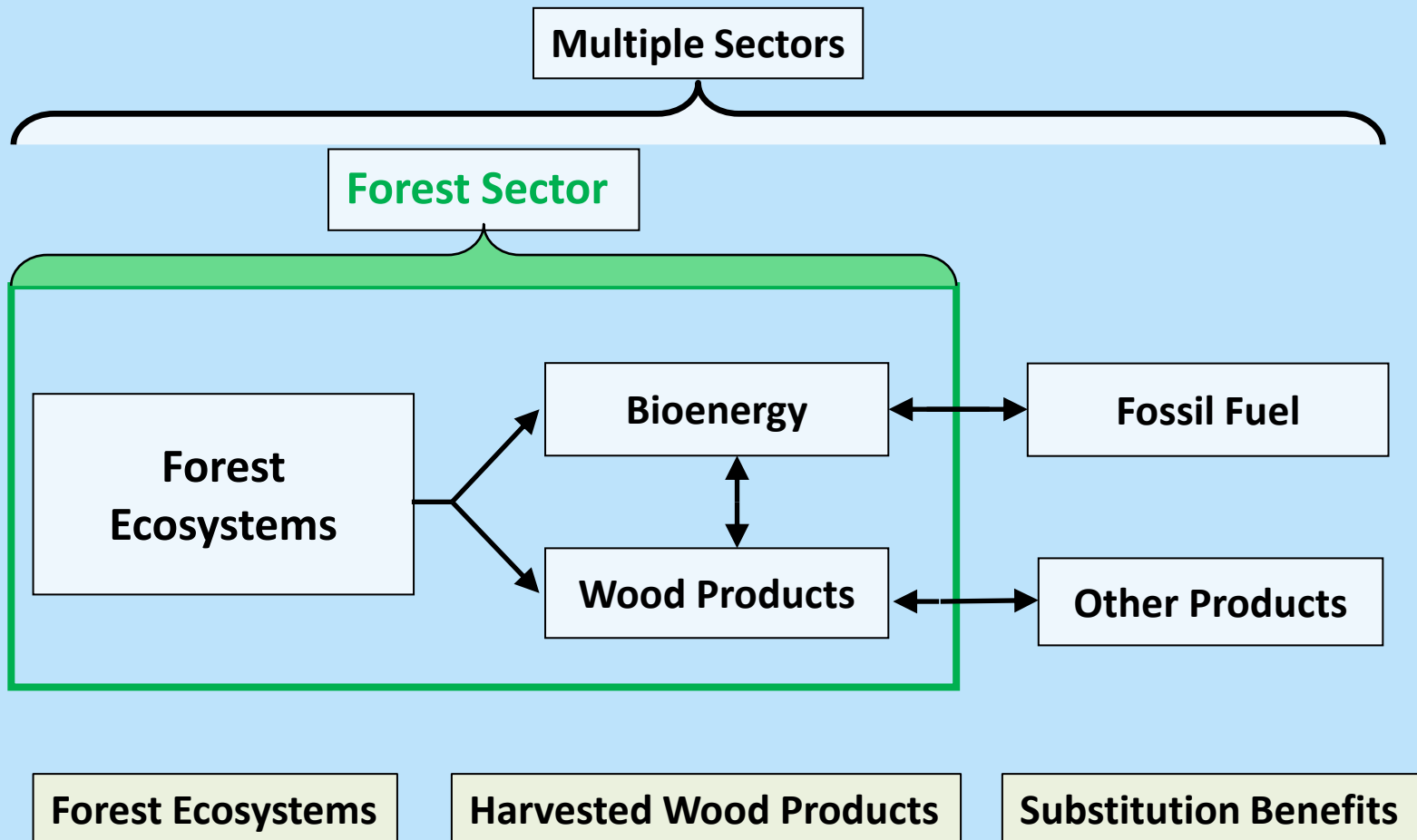


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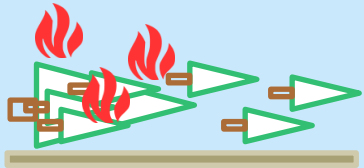
Climate Change Mitigation

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

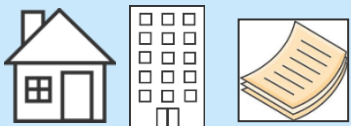


Mitigation Options

BASELINE

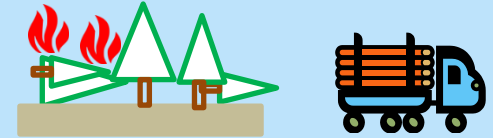


Decay- Slashburning



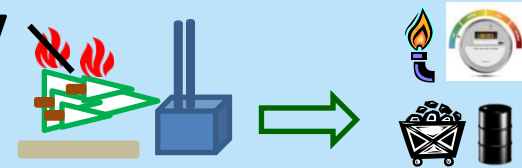
A. Higher Utilization

- 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

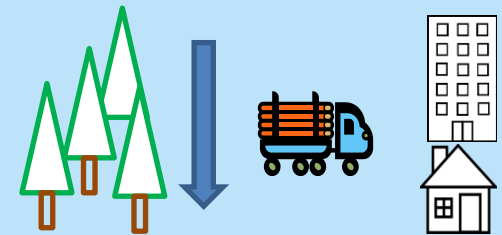


C. Higher Utilization + Bioenergy

- 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)

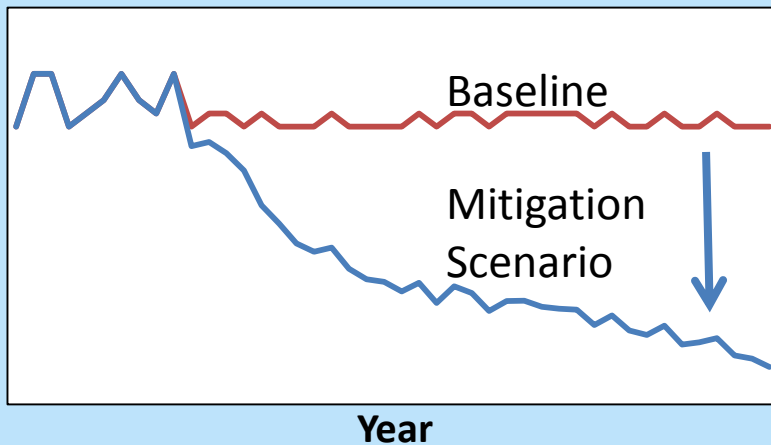
- Shift from pulp and paper to panels (4% shift)



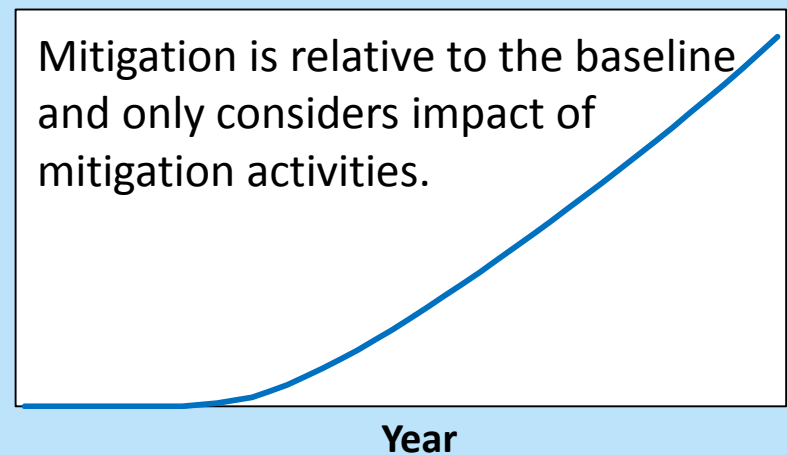
Mitigation Results

- 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.

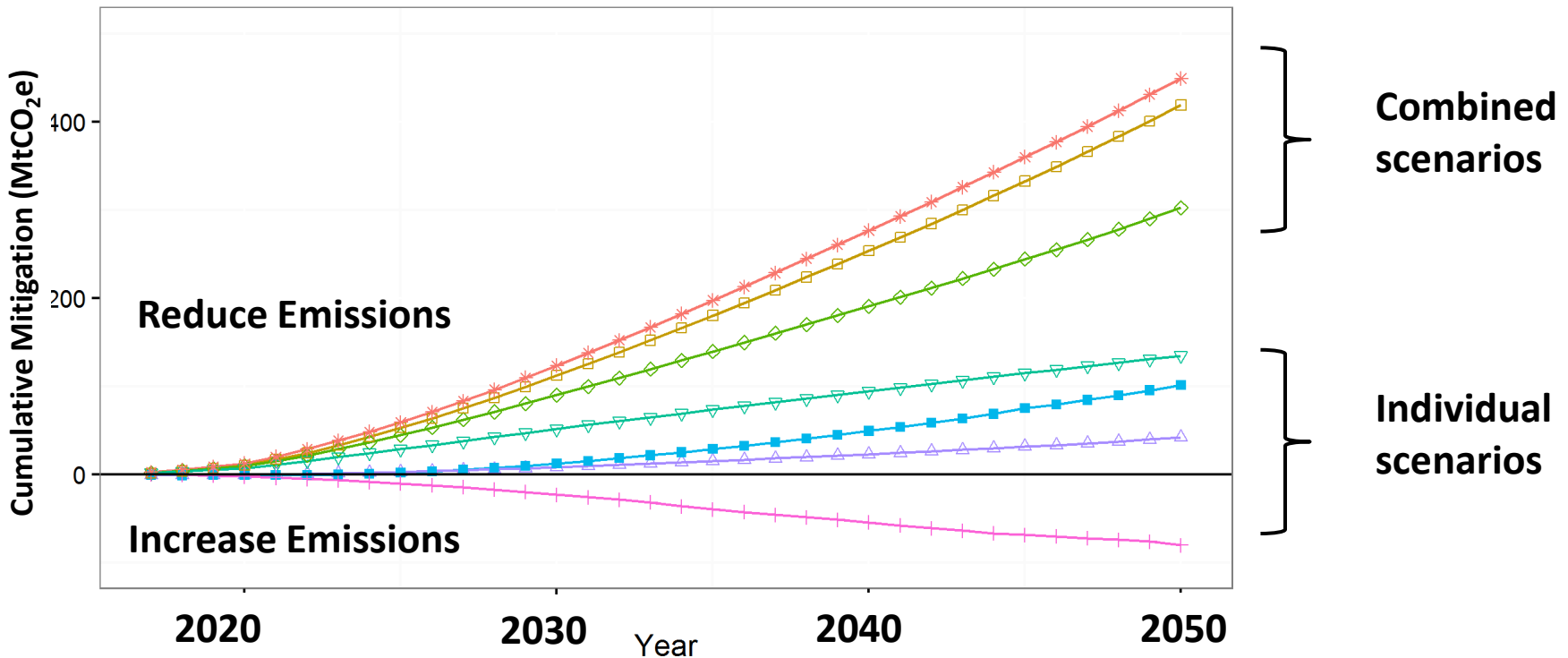
Annual Emission Reduction



Cumulative Mitigation

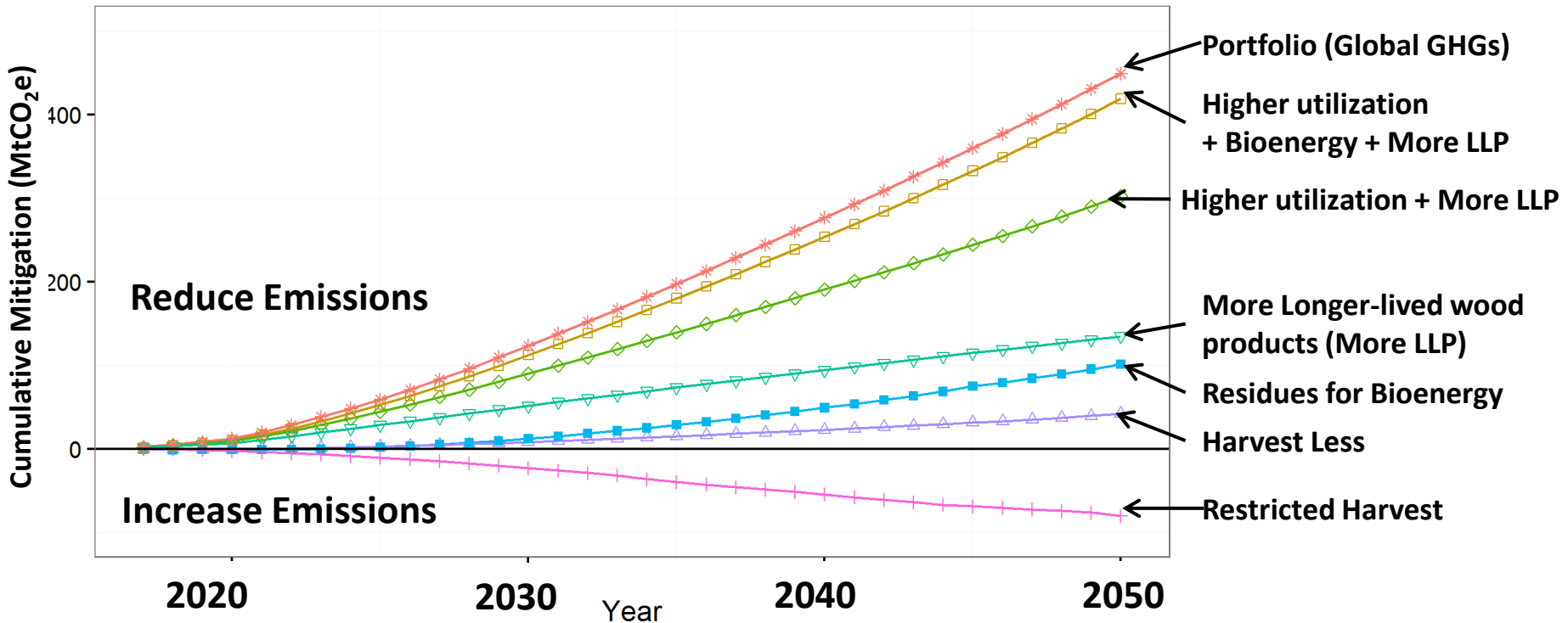


Change in GHG Emissions



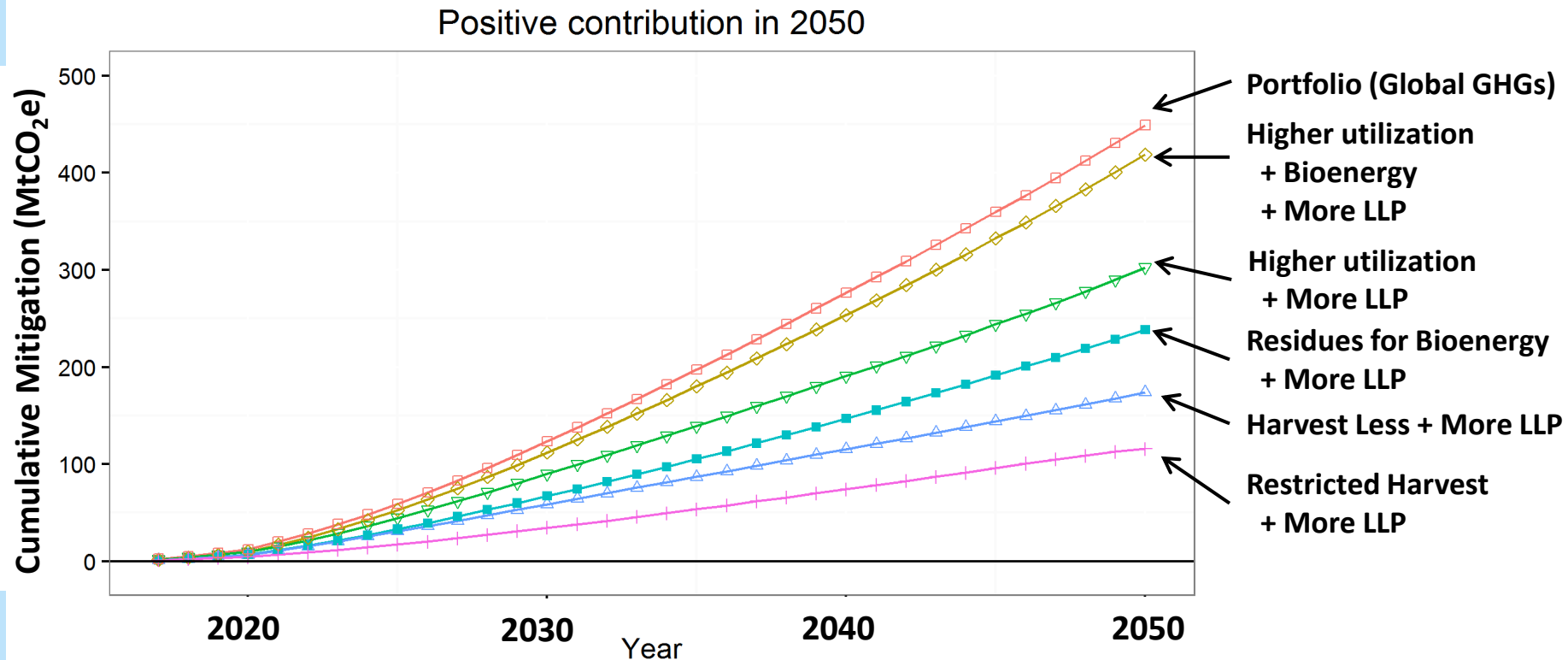
- **Wide range** of climate change **mitigation potential**, depending on the strategy considered.
- **Some strategies** have **negative mitigation potential** (increase in GHG emissions) in **some regions**. The graph shows the result of applying scenarios across BC regardless of their outcome.

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.

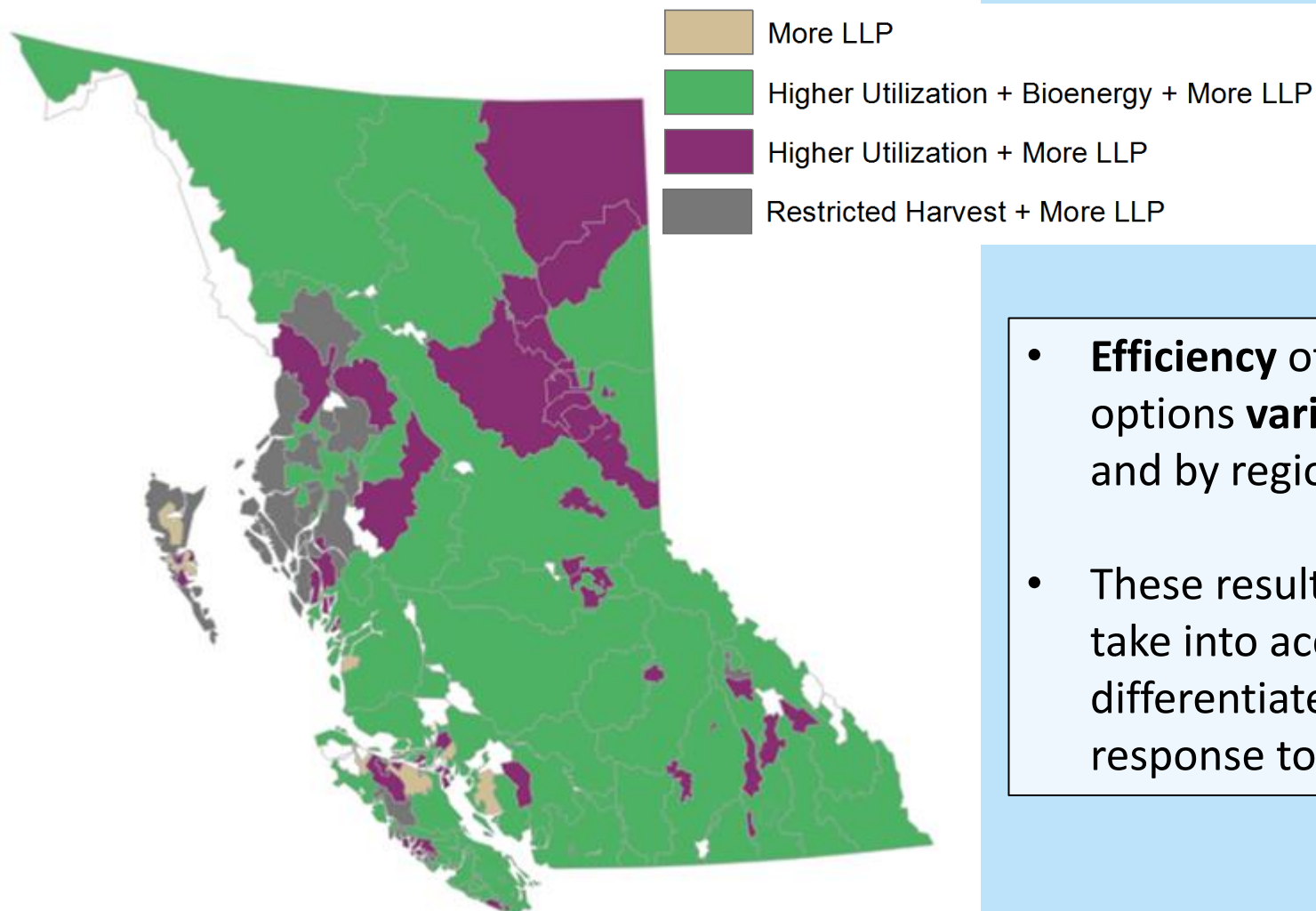
Reduction in GHG emissions



- Developing a **portfolio of activities** or combinations of activities **maximizes mitigation**.
- The **maximum cumulative mitigation potential** was **449 MtCO₂e** in 2050 of the scenarios analyzed.

Portfolio - BC Mitigation Potential

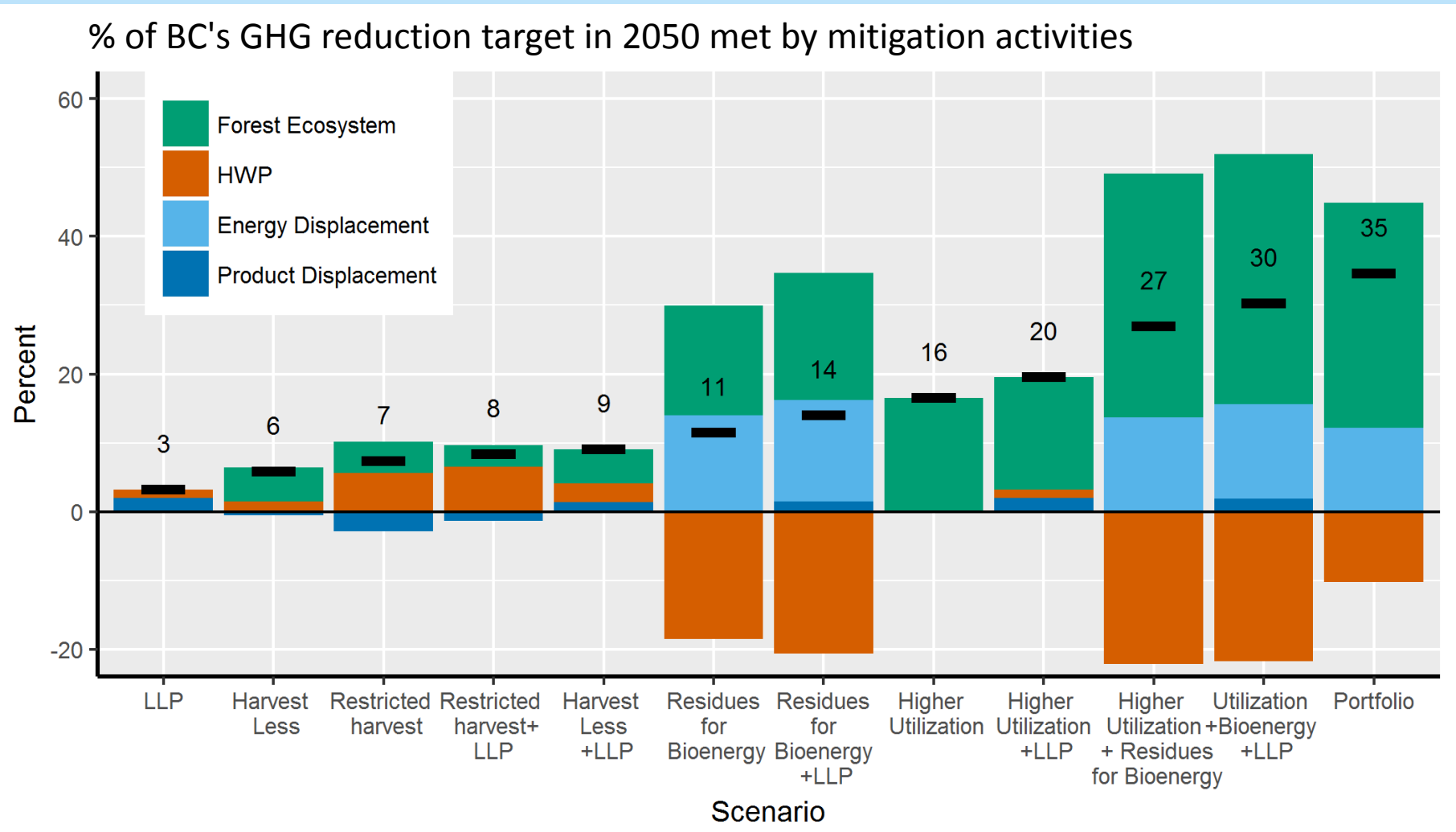
BC mitigation potential - *Excludes substitution impacts outside BC*



- **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 MtCO₂e

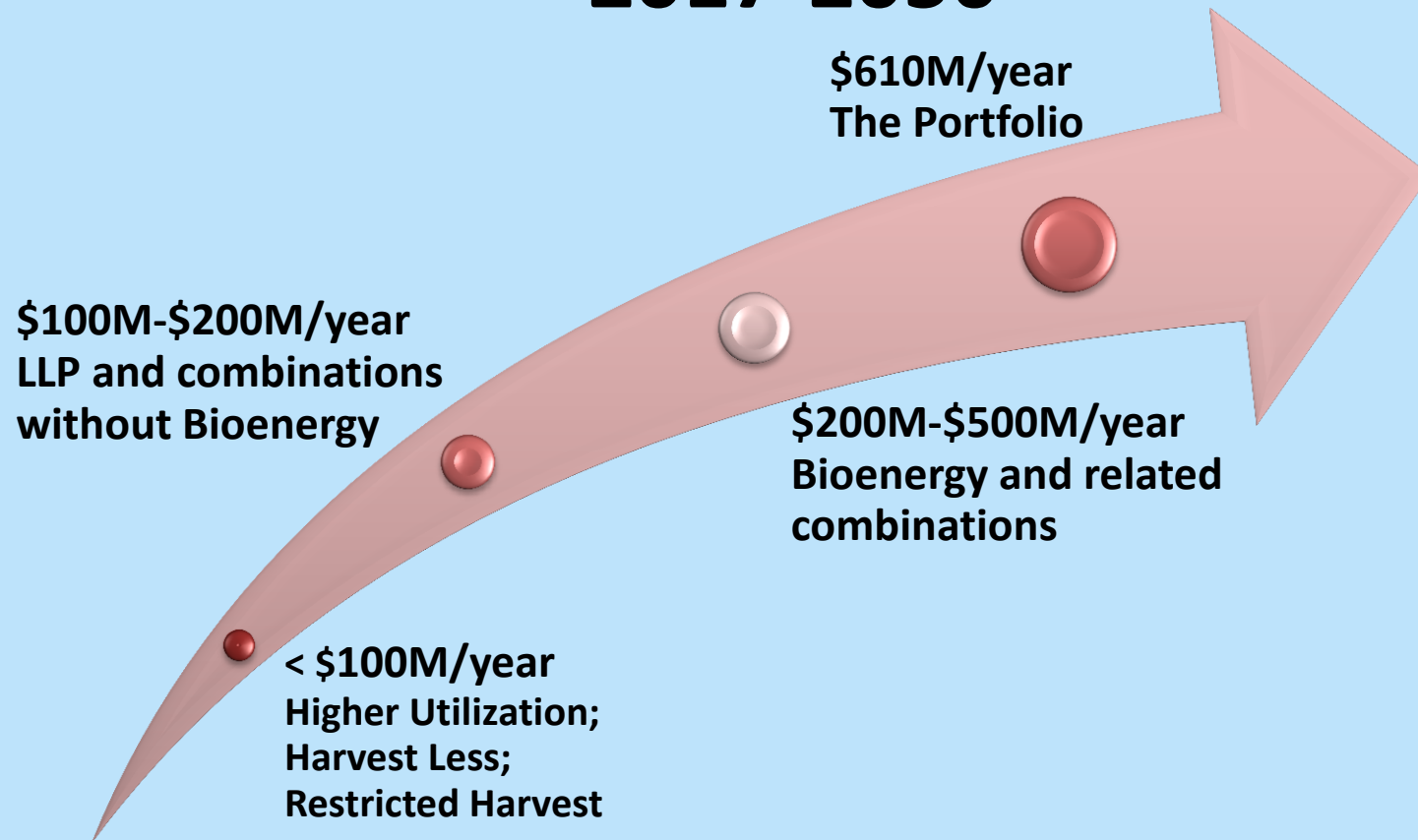


Part 2:

Costs and socio-economic impacts of
implementing options

Zach Xu

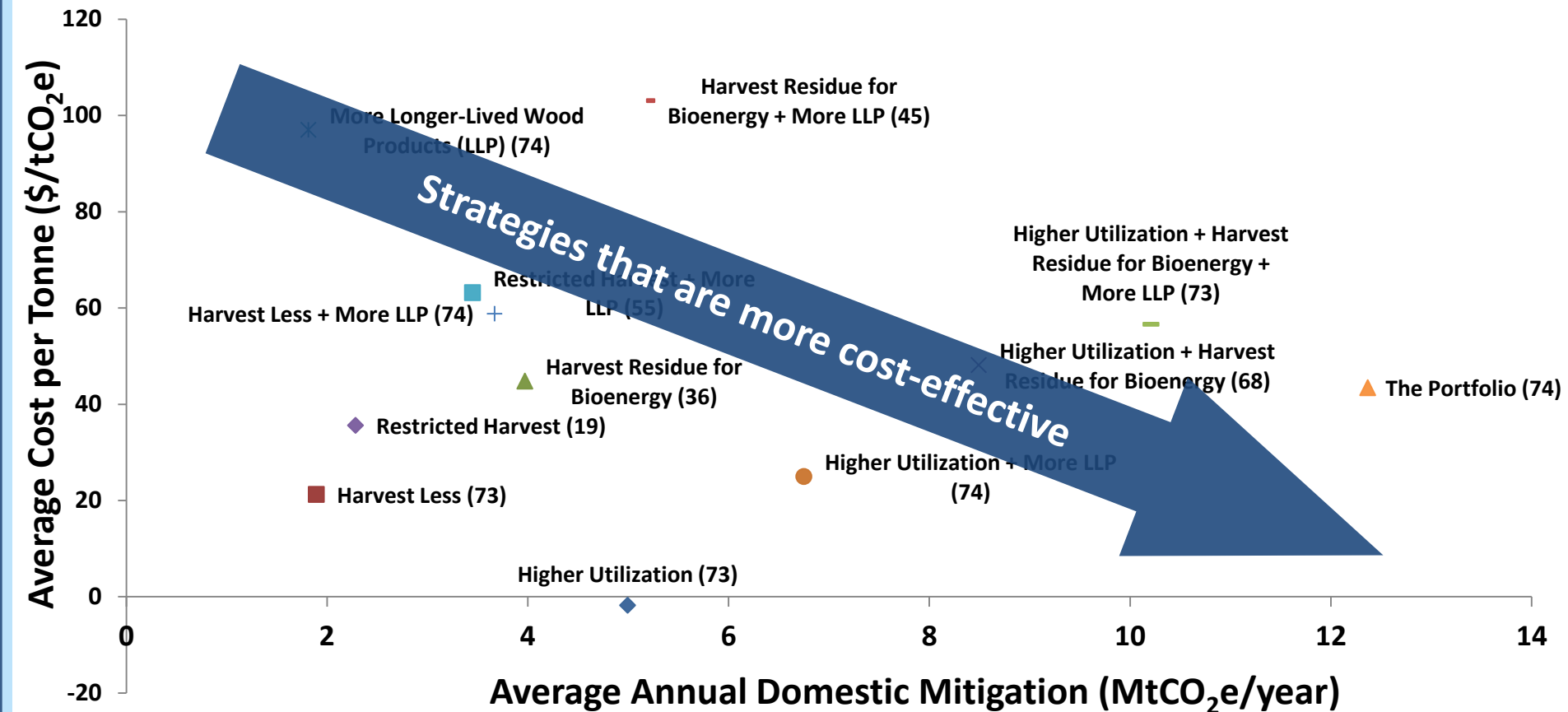
Annual Averages of Total Mitigation Costs 2017-2050



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

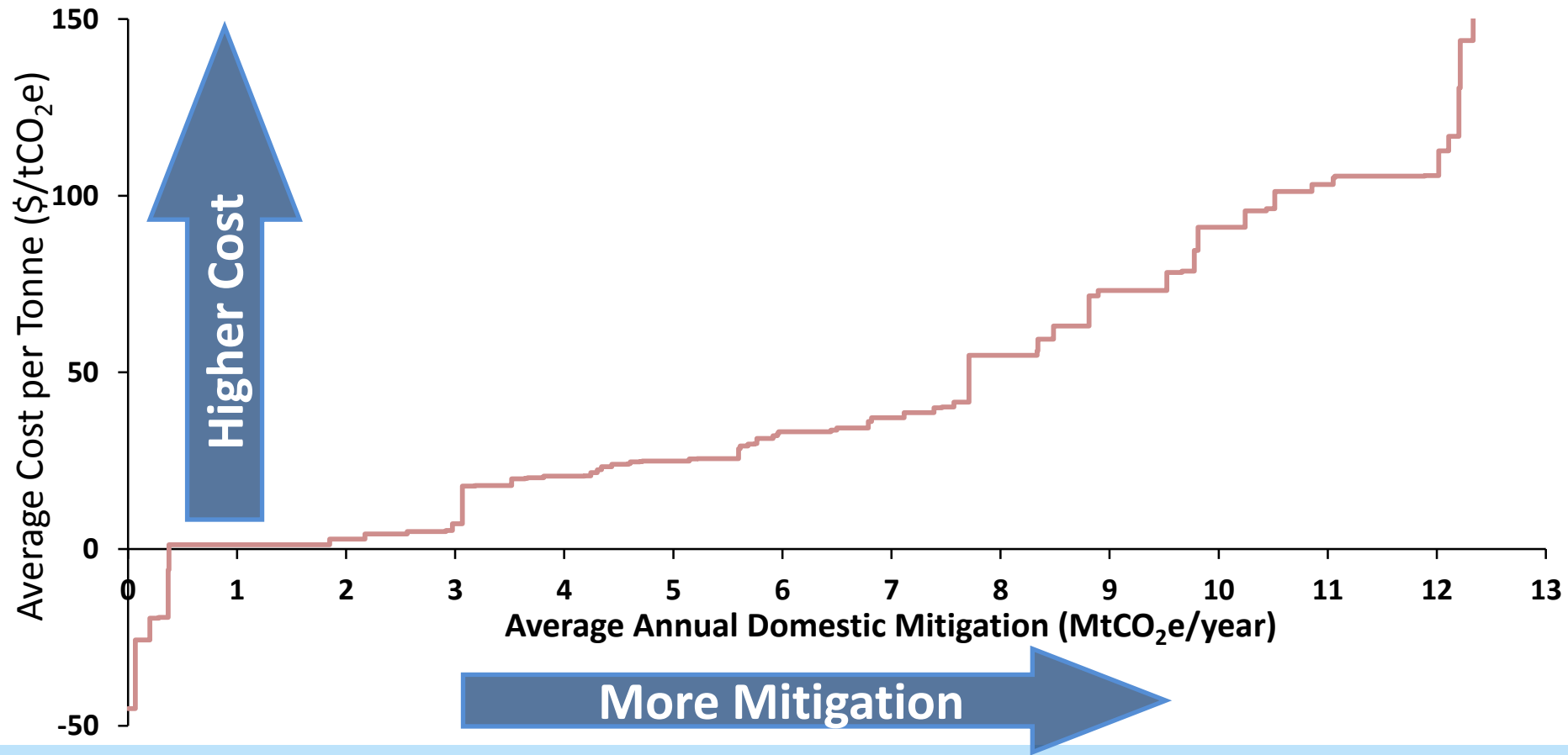
Annual Domestic Mitigation and Average Cost per Tonne



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

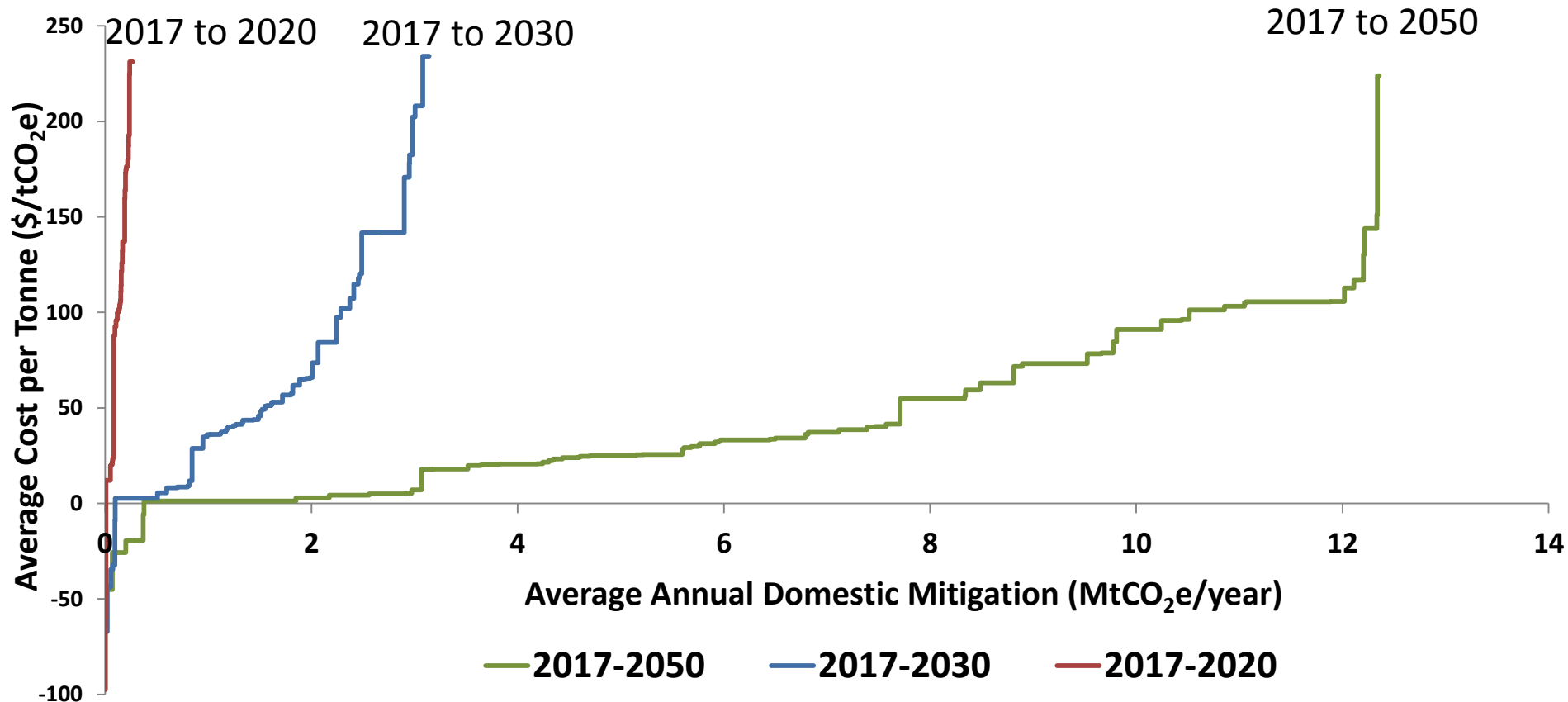
Cost Curve for the Domestic Portfolio (2017-2050)



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 MtCO₂e** would be achieved per year on average at a cost of up to **\$150/tCO₂e**, and **85%** of which can be achieved with less than **\$100/tCO₂e**

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)

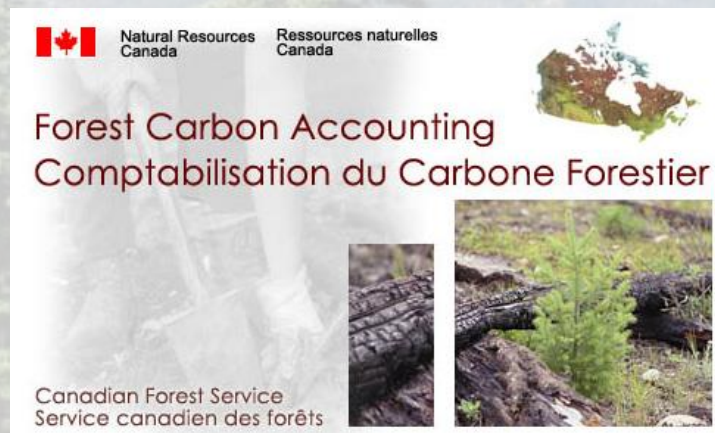
- ☑ **Forest sector mitigation could contribute more than one third to BC's 2050 GHG emission reduction target** at costs of less than \$100/tCO₂e
- ☑ By maximizing long term domestic mitigation, the **domestic mitigation** would also be able to **create significant amount of new jobs, GDP, and government 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

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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>