

# Douglas Ruth Memorial Lecture



Eddy Isaacs, FCAE  
June 13, 2022



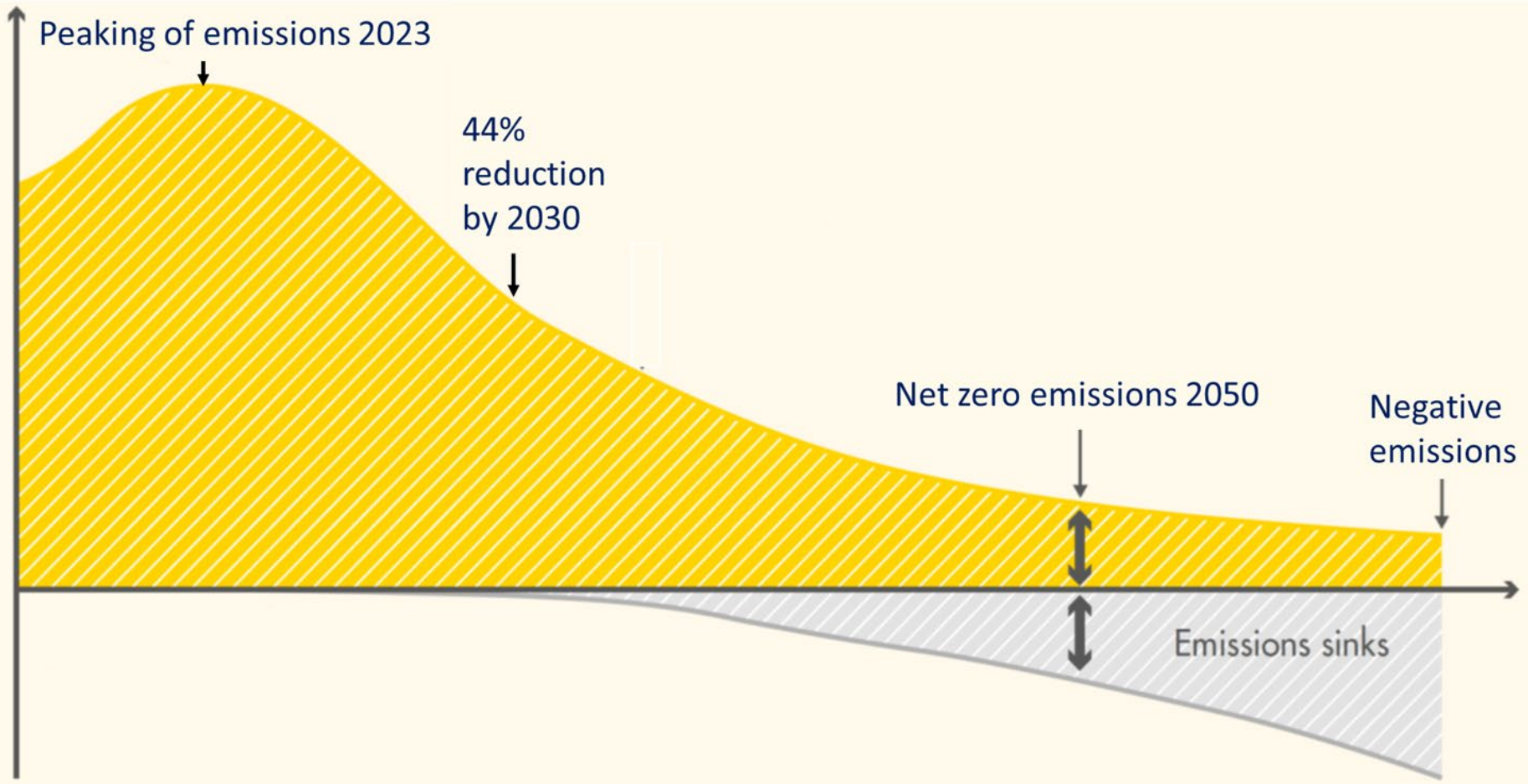
“Shameless promoter of  
everything engineering”

# The Future of Engineering Committee (FEC)

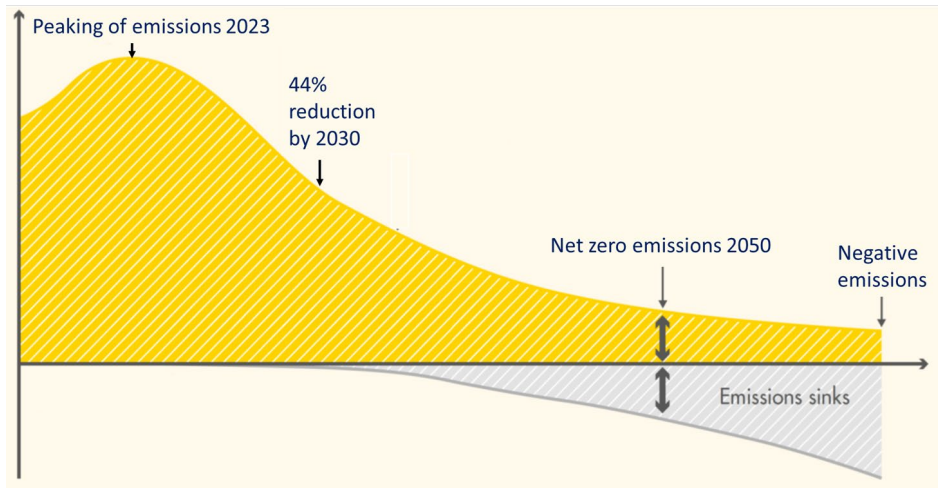
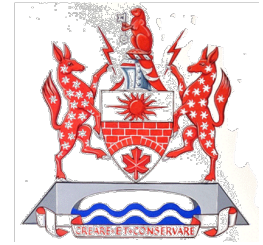


- Objective
  - Enhance the profile of engineering
  - Increase visibility of CAE
- Focus on net zero
  - Importance of engineering
  - Project management and integrated planning
  - From aspiration to reality

# Illustration of IPCC modelling studies

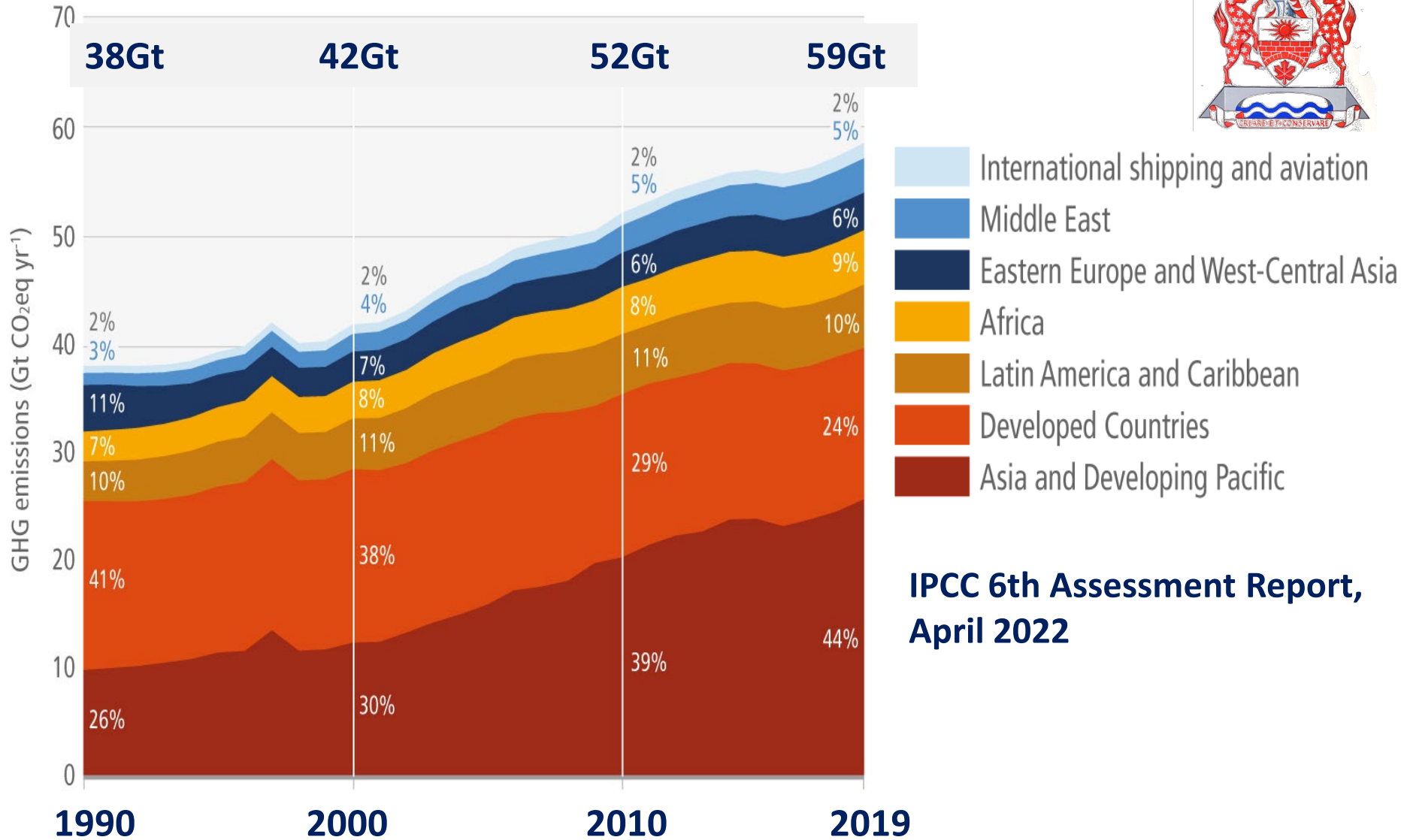


# IPCC Special Report: Modelling to limit the increase to 1.5°C



Required Outcomes in 2050 to hold to 1.5°C	Scenario 3
Final energy demand (rel. to 2010)	<b>+21%</b>
CO <sub>2</sub> emission change (rel. to 2010)	<b>-91%</b>
<b>What increases (rel. to 2010)?</b>	
Nuclear	<b>500%</b>
Renewables (non-biomass)	<b>878%</b>
Biomass	<b>121%</b>
Renewable shares in electricity	<b>63%</b>
Cumulative CCS/BECCS until 2100 (GtCO <sub>2</sub> )	<b>414</b> <b>283</b>

# Global and regional GHG emissions



**IPCC 6th Assessment Report,  
April 2022**

# Canada's GHG Emissions and International Commitments, 1990 to 2030

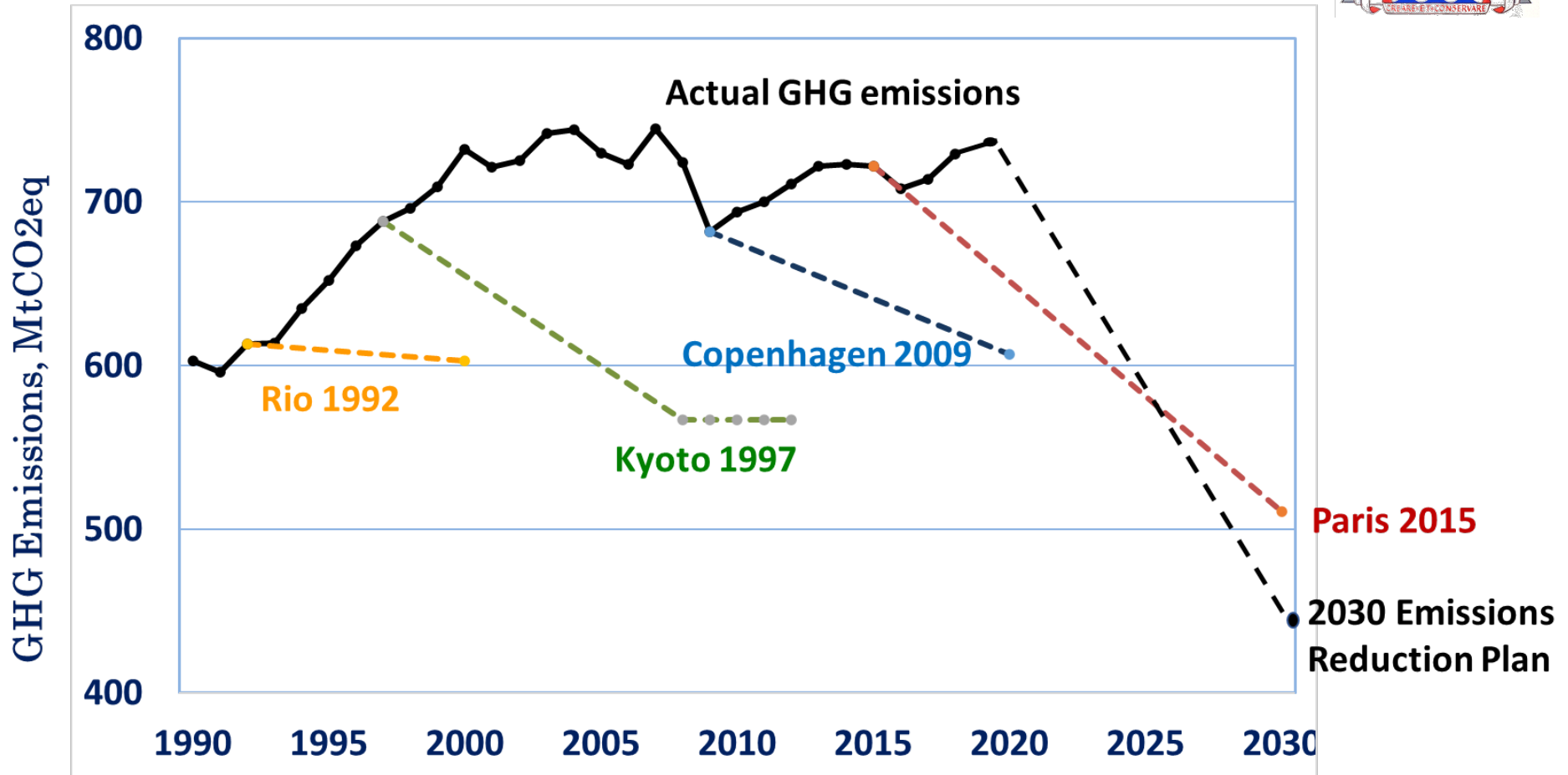
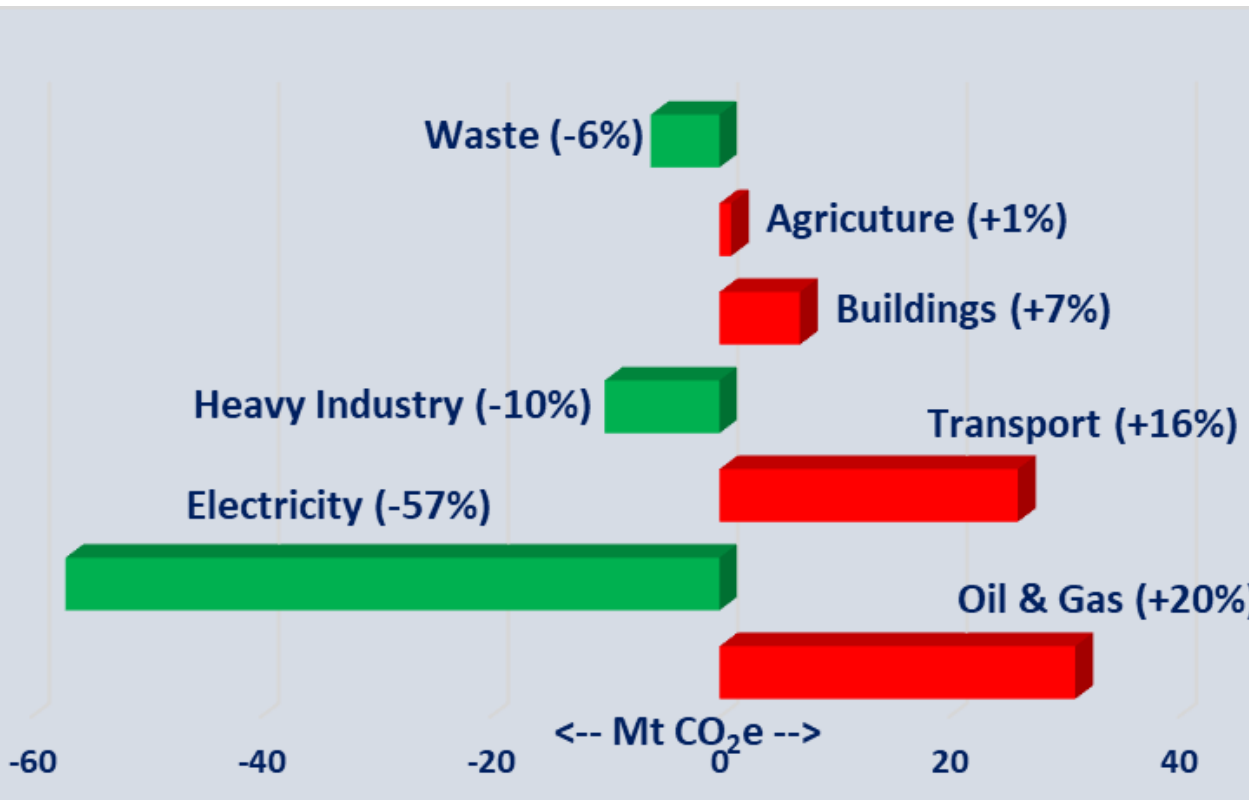


Figure based on Positive Energy (U. of Ottawa).

# Changes in GHG Emissions by Economic Sectors in Canada (2005–2019)



## 2005 to 2019

- 20% increase in oil and gas emissions
- 82% increase in crude oil production
- Near triple oil sands production

Source: *National Inventory Report, 1990–2019: Greenhouse Gas Sources and Sinks in Canada.*

# Optimism on climate change



- Wind and solar
  - 10% of global electricity in 2021
  - share doubled since 2015
- Electrification
  - Public transport
  - EVs market share increasing
  - Hydrogen & CCUS becoming viable
- Methane emissions
- Nuclear
  - Grid-scale-SMNR (300 MW) at Darlington and micro-SMNR (5 MW) at Chalk River
  - 200 MW pebble bed reactor commercial



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## Acknowledgement

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