The Canadian Academy of Engineering

L'Académie canadienne du génie

Net-zero initiatives in Canada

Robert Crawhall, FCAE
Executive Director
July 15, 2021

Major Canadian Initiatives

- Nationally Determined Contribution to UN
  - July 12 – Cut GHG by 40-45% below 2005 levels by 2030
  - Price on carbon $50p.t. 2022, to increase $15 per tonne 2023 - 2030
- Canadian Net-zero Emissions Accountability Act – June 29, 2021
  - Commitment to set targets on GHG to achieve net-zero by 2050
  - 2030 GHG target (Paris Agreement) 40-45% below 2005 levels
  - Set 2035, 2040 and 2045 targets 10 years in advance
  - Established the Net-zero Advisory Body (NZAB)
  - Commissioner of the Environment & Sustainable Development
  - Enshrining a role for Indigenous knowledge in climate accountability
- "A Healthy Environment and a Healthy Economy" plan, 2020
  - Reduce energy waste with energy efficient homes and buildings
  - Clean, affordable transportation and power
  - Price on carbon plus household rebates
  - Clean industrial advantage
  - Natural approaches to GHG sinks and resilience, protect land and ocean

Government Strategies and Initiatives

- Green Future
  - Hydrogen strategy
  - Carbon capture, utilization and storage strategy
  - Clean fuel standard – 13% decrease in 2016 carbon intensity by 2030
  - Regulatory co-operation on Low Carbon Fuels in transportation with US
  - $10B in low carbon infrastructure; public transit, clean power, broadband
  - Greenhouse Gas Pollution Pricing Act, 2018 – Trading & Fuel Charge
  - Strategic Investment Fund – Net-zero Accelerator, 2020
- Canadian Institute for Climate Choices
  - Funded by government – Research, engagement, expertise, case studies
  - Clean growth/adaption/mitigation
- 2016 Pan-Canadian Framework on Climate Change
  - Original target, 30% below 2005 levels

CAE Sustainability & Climate Change

- 2016 Trottier Report on Energy Futures – NATEM pathways
- 2020 – 2025 Strategic Plan
  - Sustainability – ESG, SDG
  - Net-zero 2050
  - Oceans Engineering
  - Women & Indigenous representation
- Future of Engineering Committee
- Seminar Series
- Conferences on Ultra-low Energy & Resilient Building
- AGM Keynotes
- Response to studies and position papers
- Engagement with government through partner organizations

CAE Perspective on Net-zero 2050

- Taking an Engineering Perspective on:
  - Energy
  - Transportation
  - Industrial processes
  - Commercial and residential HVAC
- Double electricity capacity. Effective carbon capture.
- More than technology: finance, social & environmental license, skills, materials, jurisdiction, infrastructure, prototypes, scale-up, legacy, lifecycle, project and program management
- Paths to success, risk mitigation
- Schedule and budget to completion – 29 years counting down
- International collaboration, competition, opportunity, leadership

If policy makers get it right, engineers will have to build it; if they get it wrong, engineers will have to fix it.

Recent Seminars & Conferences

- Nuclear Fission & Fusion: Widening the Path to Net-zero
- Future Perspectives of Engineering Education and the Pandemic
- Choosing Canada's Automotive Future
- Net Zero & Industrial Activity in Canada's Oceans
- Mentoring Women in Engineering
- Net-zero Emission Panel
- 2nd Richard Marceau Energy Symposium – national grids
- Roadmap to Resilient Ultra-low Energy Built Environment with Deep Integration of Renewables
- Northern Infrastructure Corridor
- Response to Report on Canada's Resilient Recovery
- CAE Energy Program – An Introduction
- Trottier Energy Futures Project

Ultra-low Energy Resilient Building

October 16, 2020 – Concordia University, Centre for Zero Energy Building Studies

- "Roadmap to Resilient Ultra-low Energy Built Environment with Deep Integration of Renewables in 2050"
- Welcome by Gina Cody, FCAE; Graham Carr; Yves Beauchamp, FCAE
- Co-chairs: Andreas Athienitis, FCAE, Andrew Pape-Salman, FCAE
- 18 papers – Net-zero building codes, self-sufficient buildings

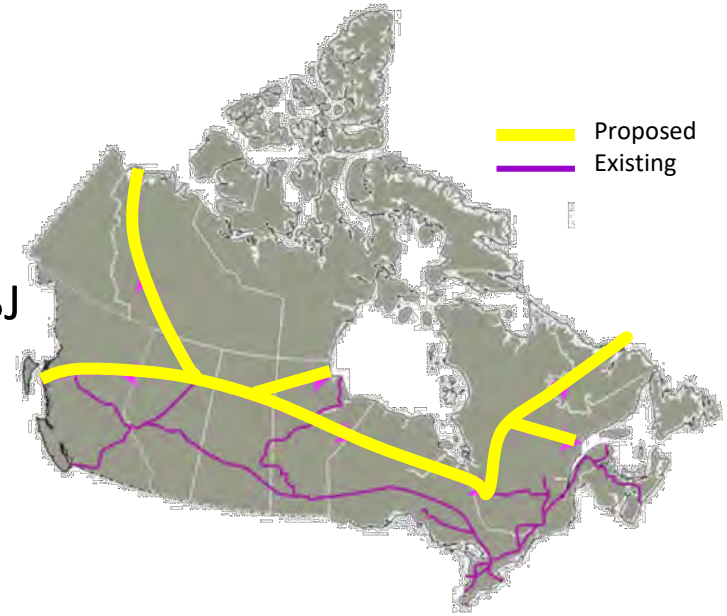
October 12, 2021 – seminar

Spring, 2022 – Victoria, B.C.

- Collaborating to change building practices

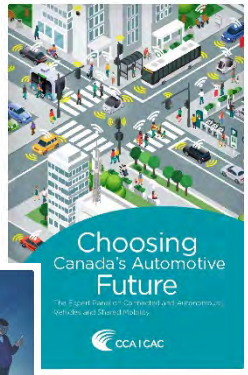
Northern Infrastructure Corridor

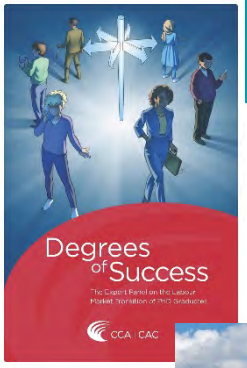
- Seminar building on the Senate report *National Corridor, Enhancing and Facilitating Commerce and Internal Trade*
- Keynote John McDougall, FCAE.
- Panel discussion:
  - Dr. Axel Meisen, FCAE;
  - Réal Laporte, FCAE, former president SEBJ
  - Marshall Kern, Bowman Centre for Sustainable Development.



Council of Canadian Academies

- *Royal Society of Canada (TSC)*
- *Canadian Academy of Health Sciences (CAHS)*
- *Canadian Academy of Engineering (CAE)*





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Assessments

Choosing Canada's Automotive Future

- Jeannette Montufar (Chair)
- Peter Frise

Degrees of Success

- Elizabeth Cannon (Chair)
- Jay Doering

Canada's Top Climate Change Risks

- John Leggat (Chair)
- Darrel Danyluk

Engaging Government

- Primary path to engage government is through the CCA
- In 2016, The Trottier Report was the primary technical document of the Canadian Government at COP22 Marrakesh
- The CAE is developing its status with UNESCO
- A number of Fellows work for government
- Increasing engagement at a sub-national level
- Key policy makers are invited to seminars
- Outreach to Senators, political strategists, parliamentarians
- The CAE is not funded to provide advice to government, so we currently work through organizations that are
- Currently developing a distinct voice – “engineering perspective”

About the CAE

- Founded in 1987, spun off from the Royal Society of Canada
- Not-for-profit, charity
- 869 Fellows – 101 women (12%), 768 men (88%)
- 80% licensed engineers
- 50 new Fellows and 2 International Fellows per year
- Founding Academy of the Canadian Council of Academies (CCA), 2005
- Member of the International Council of Academies of Engineering and Technological Sciences (CAETS)
- Member PAGSE Board