Presentation Slides

RALPH TORRIE

Setting the Context: Global Climate Change and Social Housing: What's the Connection? What's the Opportunity?

Clean Air Partnership Workshop:
Improving the Odds for Achieving Successful Social Housing Energy Efficiency Retrofits

Toronto, October 6, 2016

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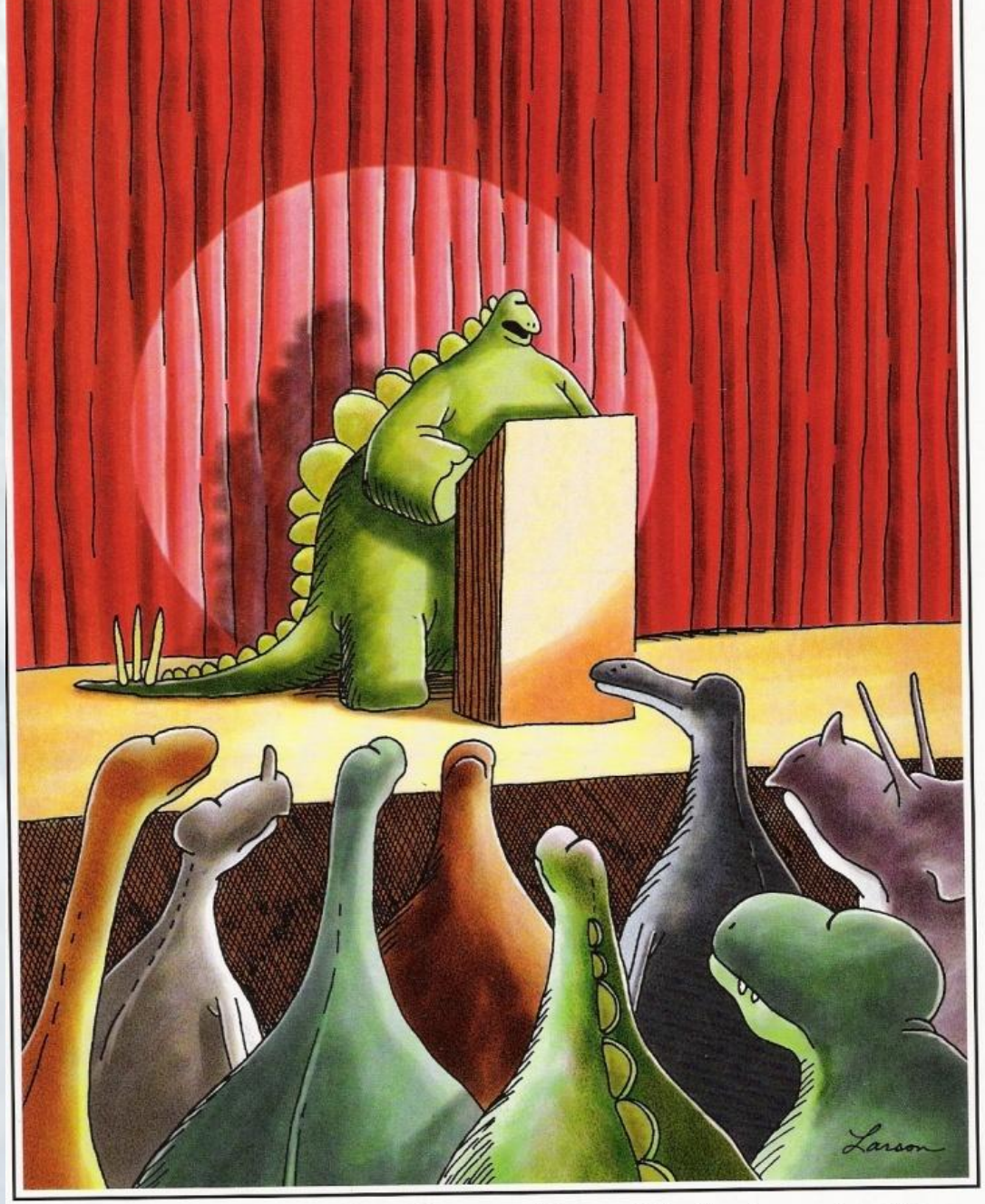
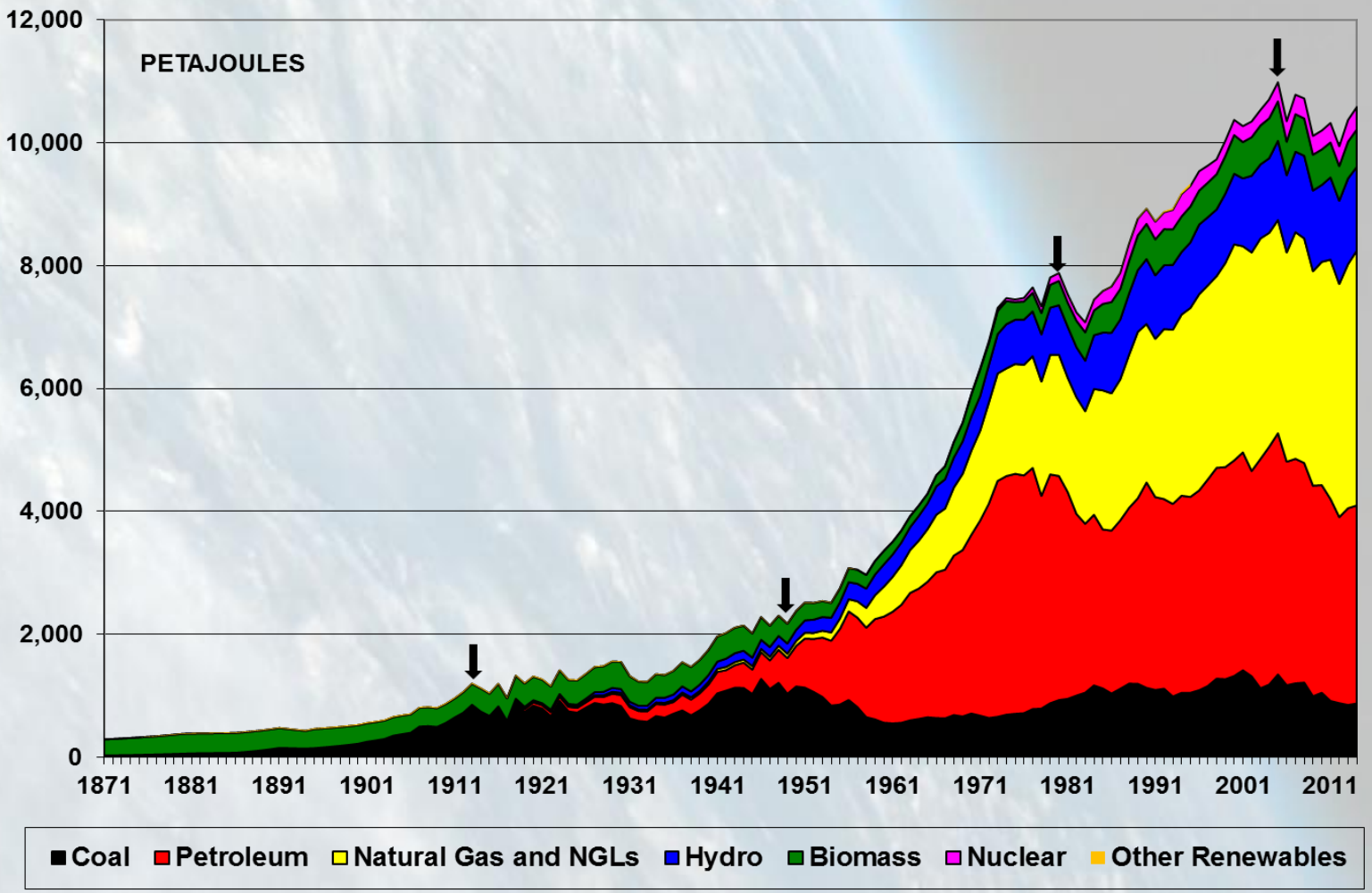


"The picture's pretty bleak, gentlemen. … The world's climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut."

Primary Fuel and Electricity Use in Canada, 1871-2013



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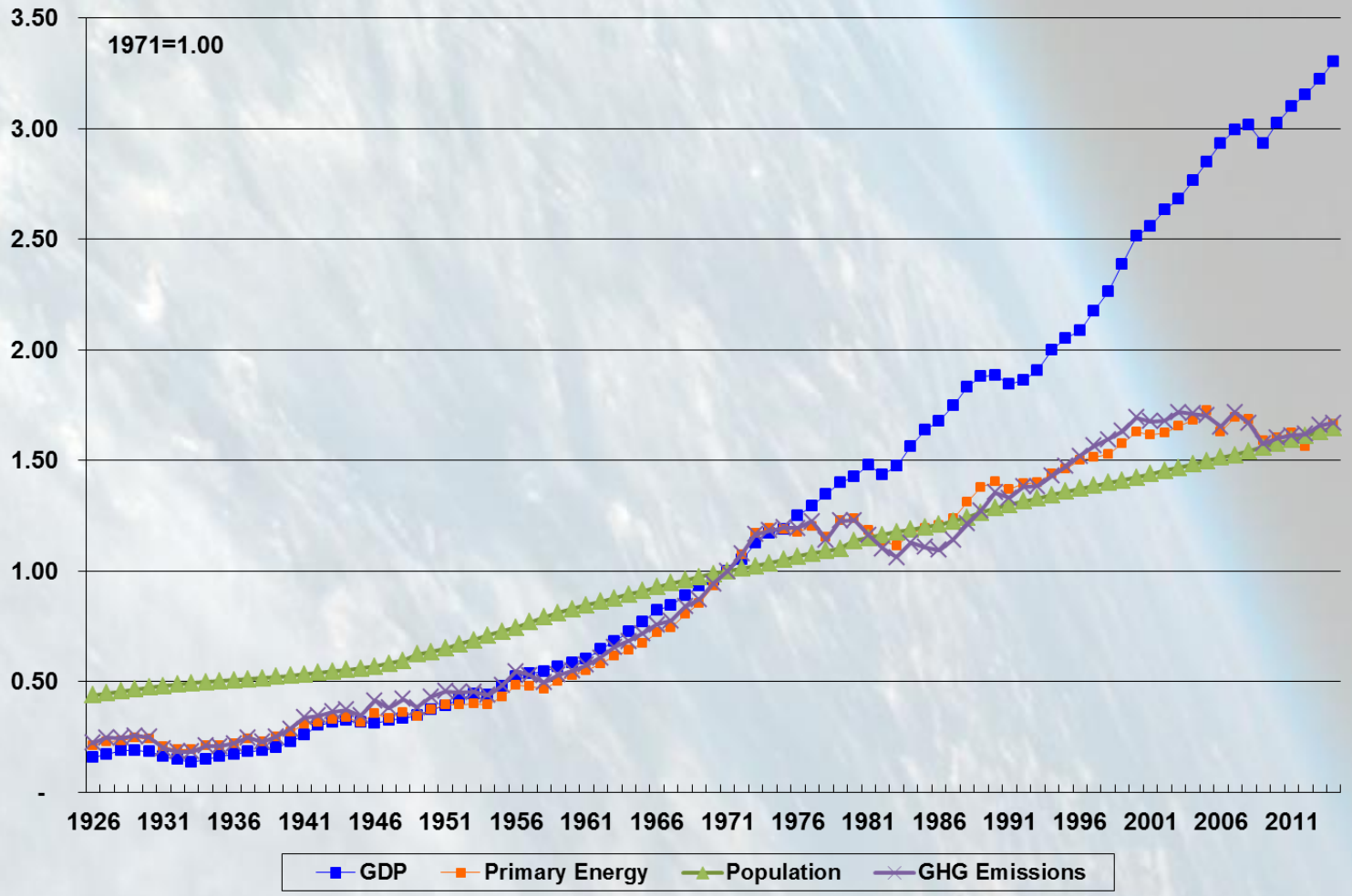
Relative Growth of Population, GDP, Primary Energy and GHG Emissions, 1926-2013, Canada



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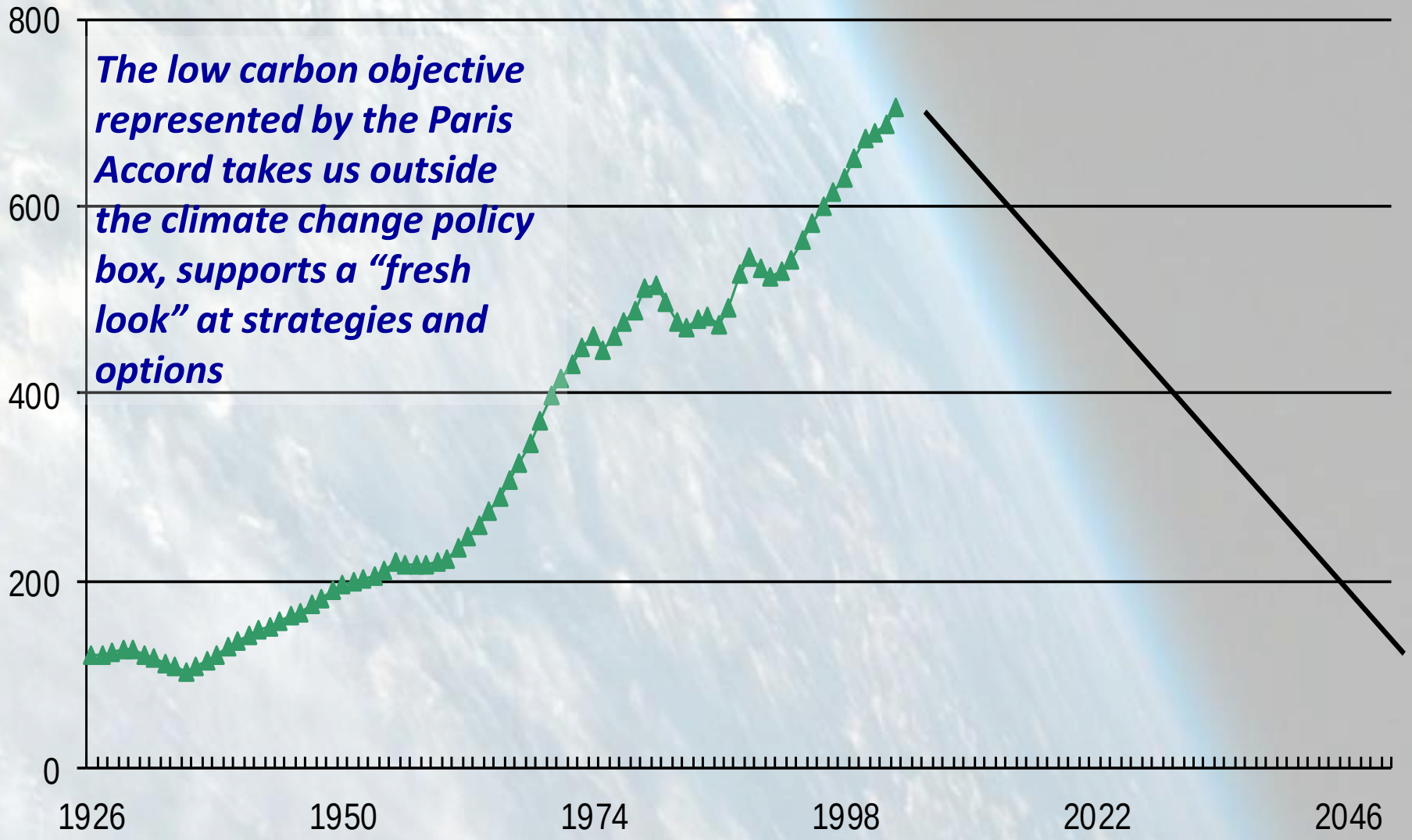

The low carbon objective represented by the Paris Accord takes us outside the climate change policy box, supports a "fresh look" at strategies and options

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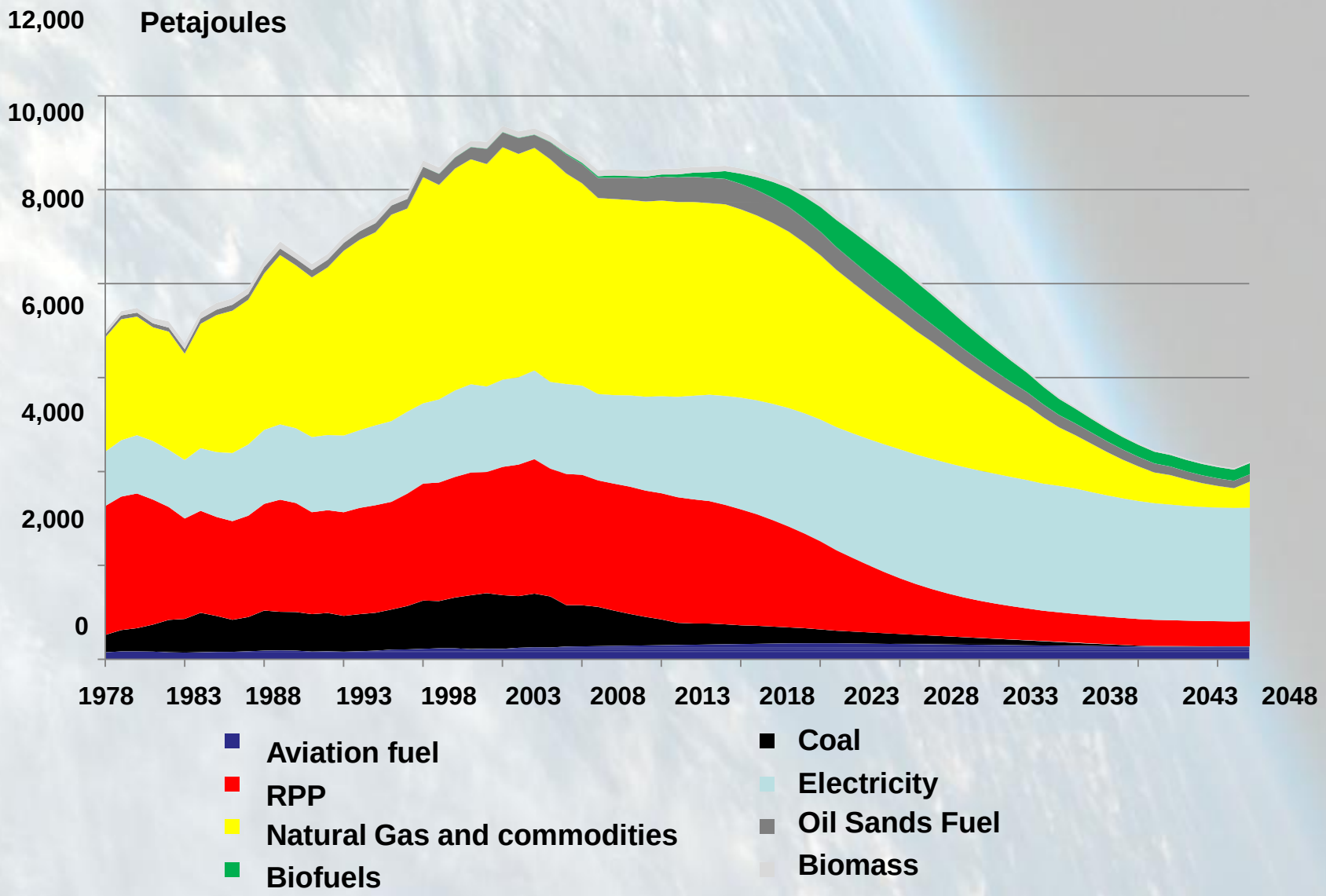
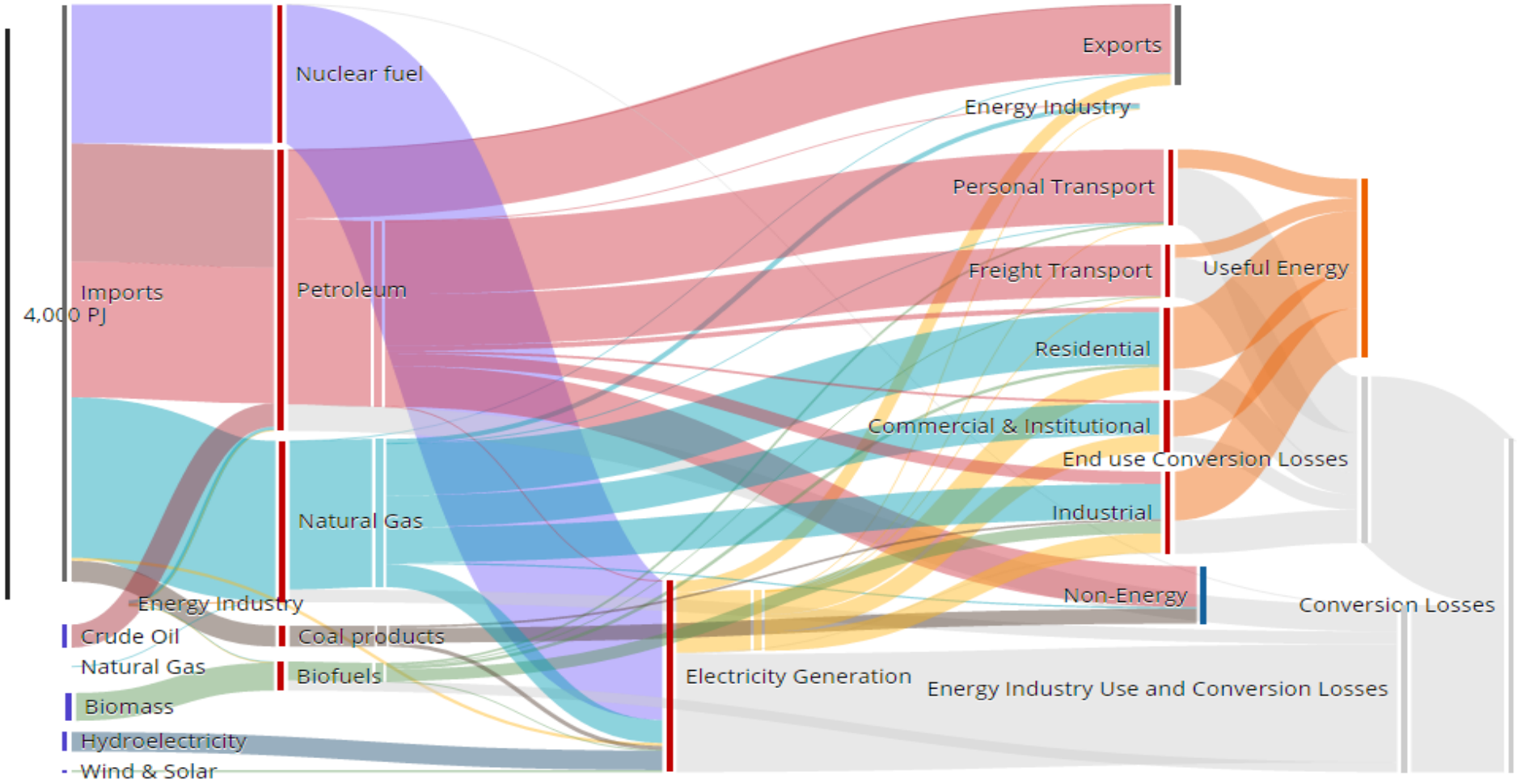
Illustrative Low-Carbon Energy Transition for Canada…



Ontario's Energy Systems in 2013



LEGEND

Flows

- Crude oil
- Hydroelectricity
- Renewable energy
- Natural gas
- Uranium
- Electricity
- Coal
- End-use energy
- Conversion losses

Processes

- Primary energy
- Harvesting and conversion technologies
- Imports and exports
- Fuel use for energy producers

Data source: CanESS v7.
Sankey diagram built with D3's Sankey plugin.

POWERED BY CanESS

Greenhouse Gas Emission Factors for Fuels and Electricity in Ontario, 2013

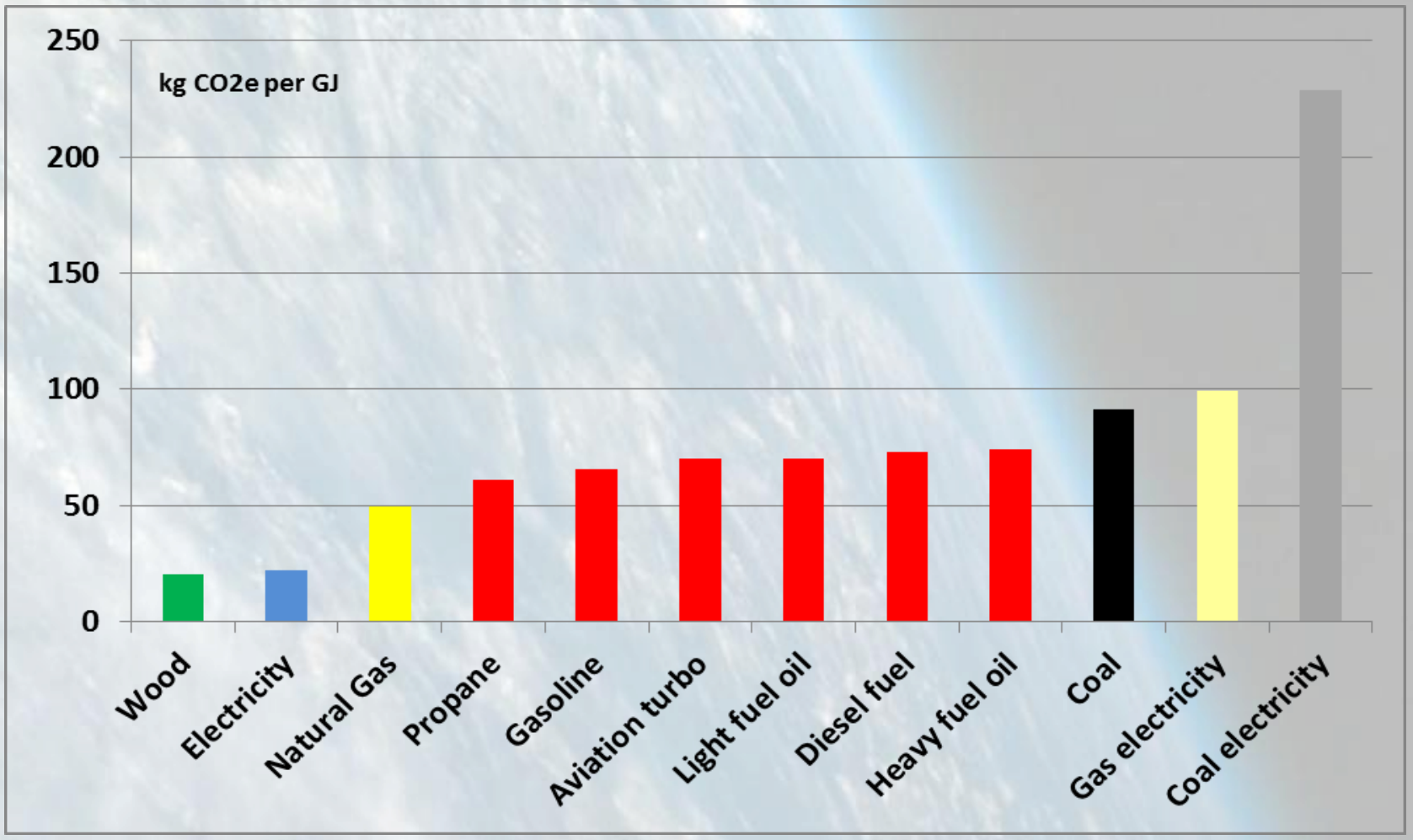


Figure 5-12: **Fuel and Electricity Prices in Canada, by Province**

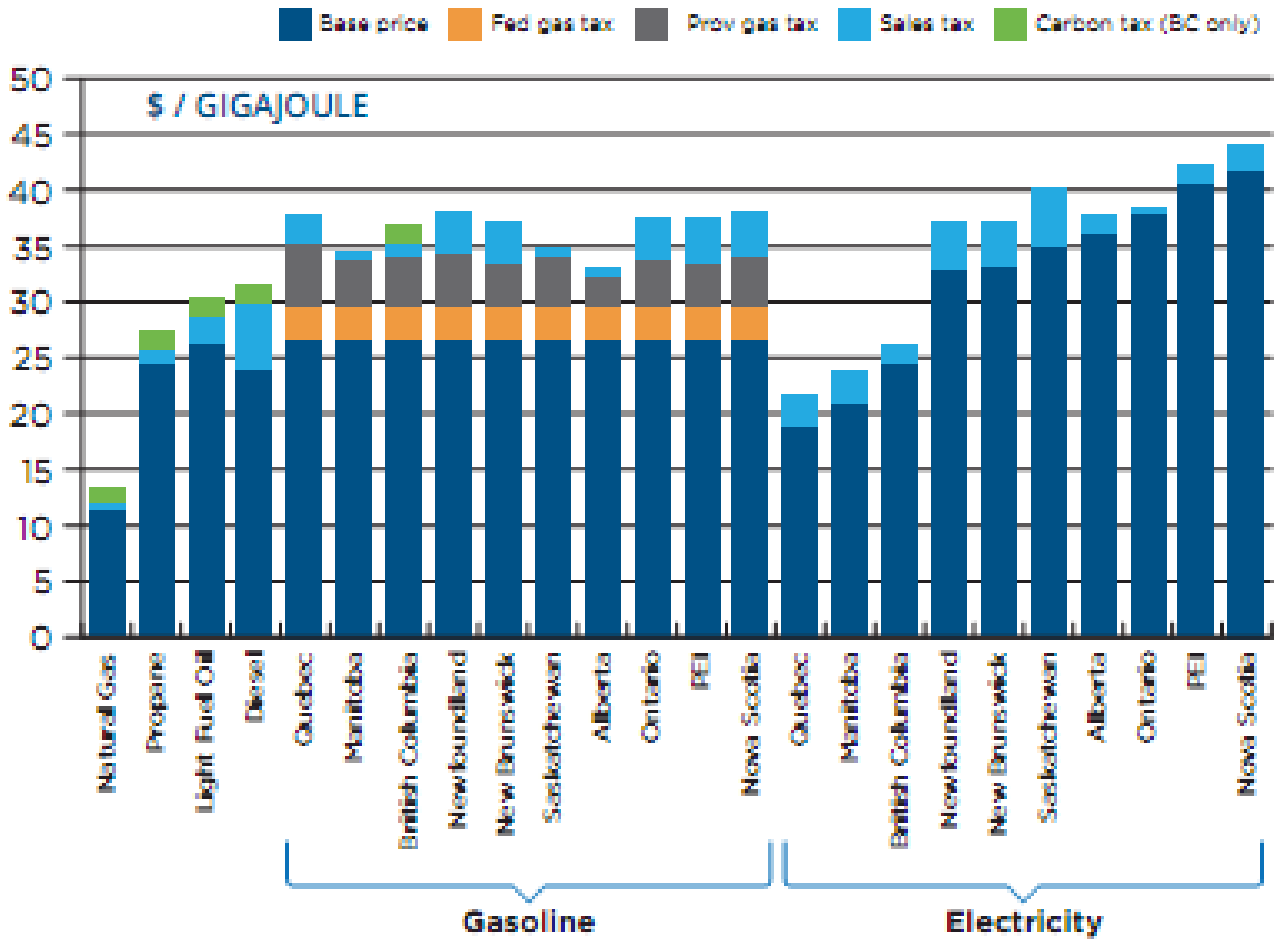


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Figure 5-13: **Energy Price Comparison by Country and by Fuel, 2012**

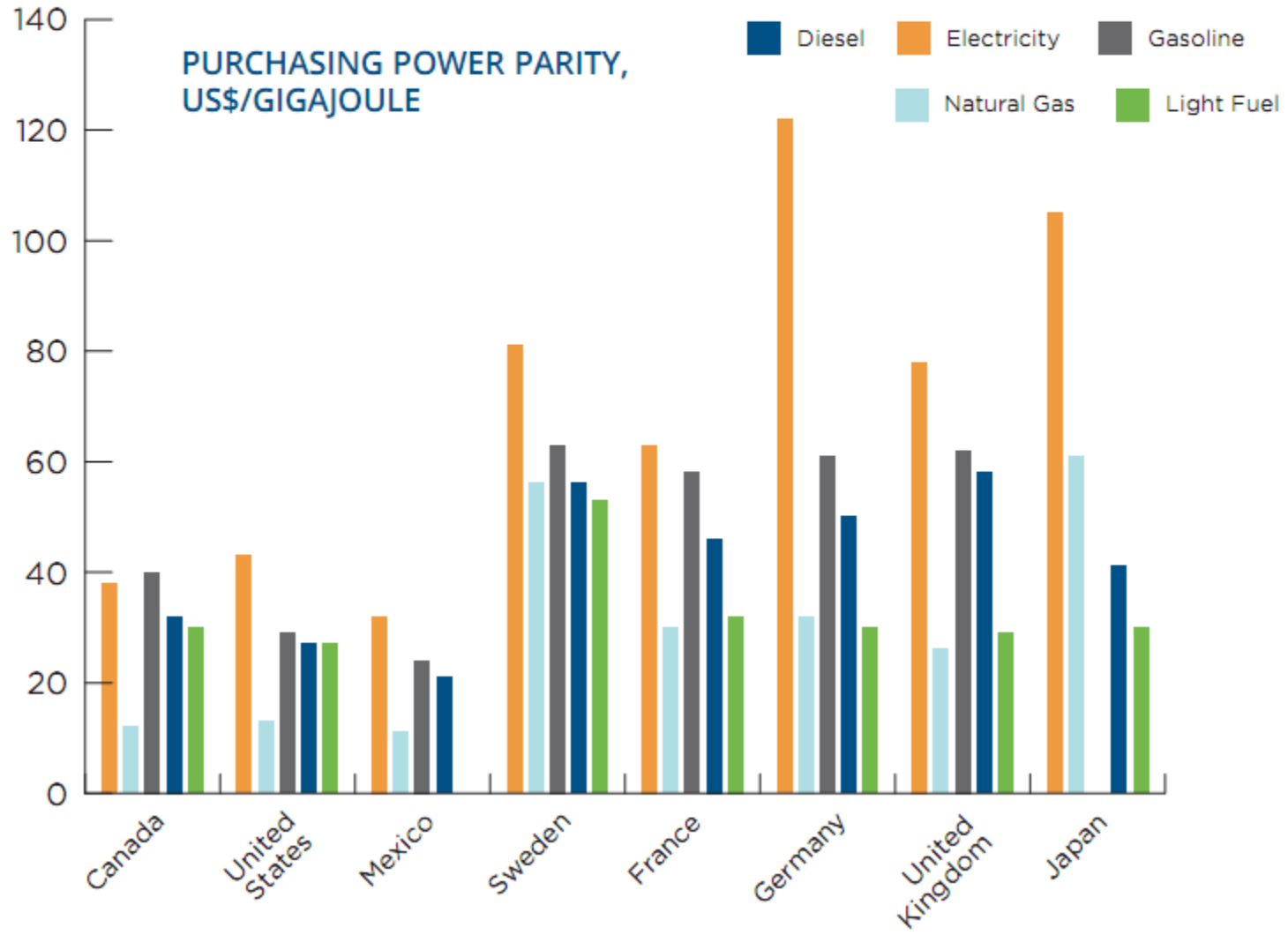

Figure 5-7: **Fuel and Electricity in Canada, 2012 – Consumption and Cost**

Sector	Fuel		Electricity		Total	
	Energy (petajoules)	Cost (millions $)	Energy (petajoules)	Cost (millions $)	Energy (petajoules)	Cost (millions $)
Residential	914	12,546	542	15,801	1,457	28,347
Commercial	728	7,944	448	13,210	1,176	21,154
Transportation (personal and freight)	2,586	75,245	4	96	2,590	75,341
Industrial	2,638	39,541	747	14,548	3,385	54,089
TOTAL	**6,867**	**135,277**	**1,741**	**43,655**	**8,608**	**178,932**

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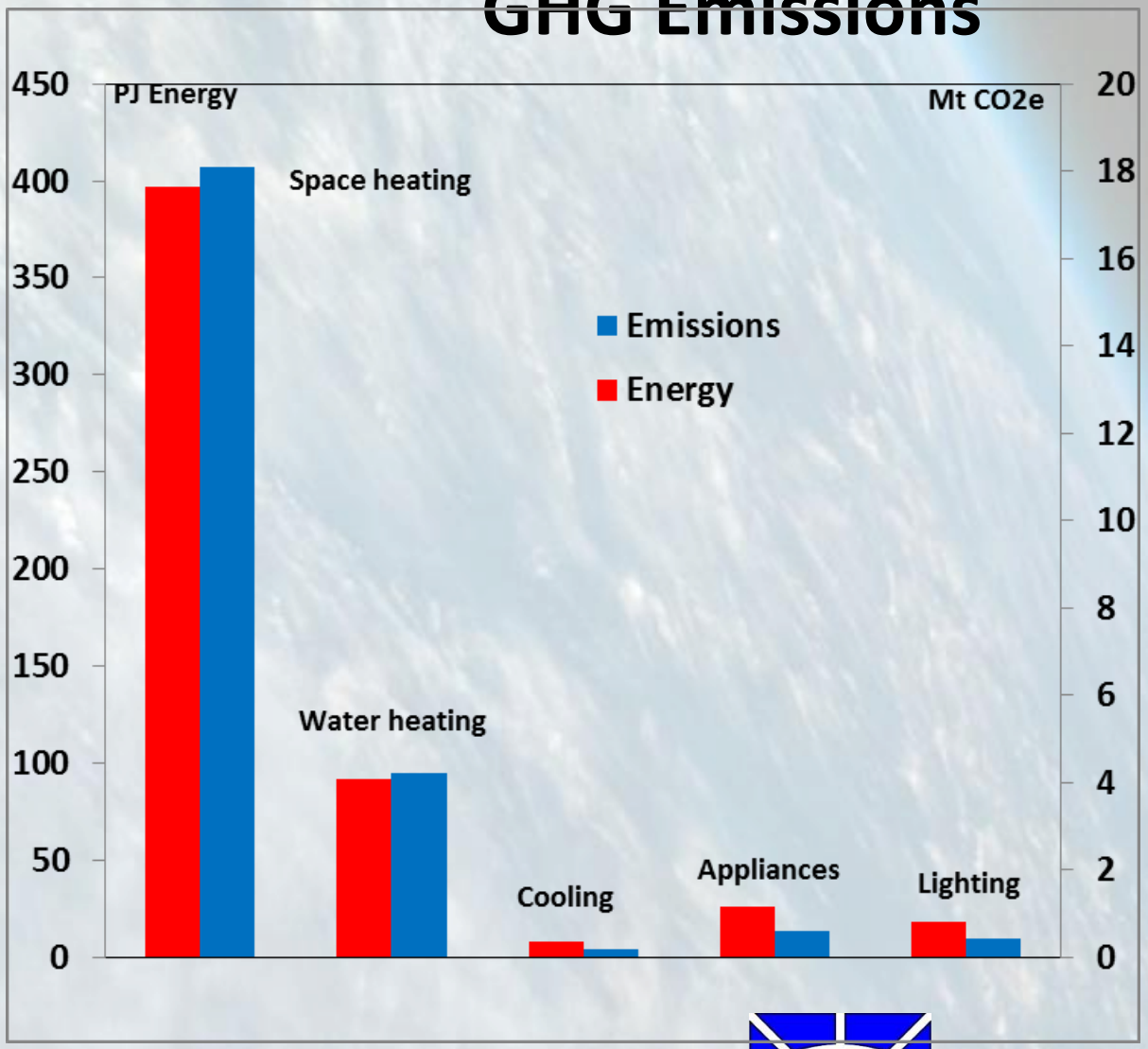
Ontario Residential Buildings in 2013 – Energy and GHG Emissions



CanESS data courtesy of whatif? Consulting

CanESS whatIf?

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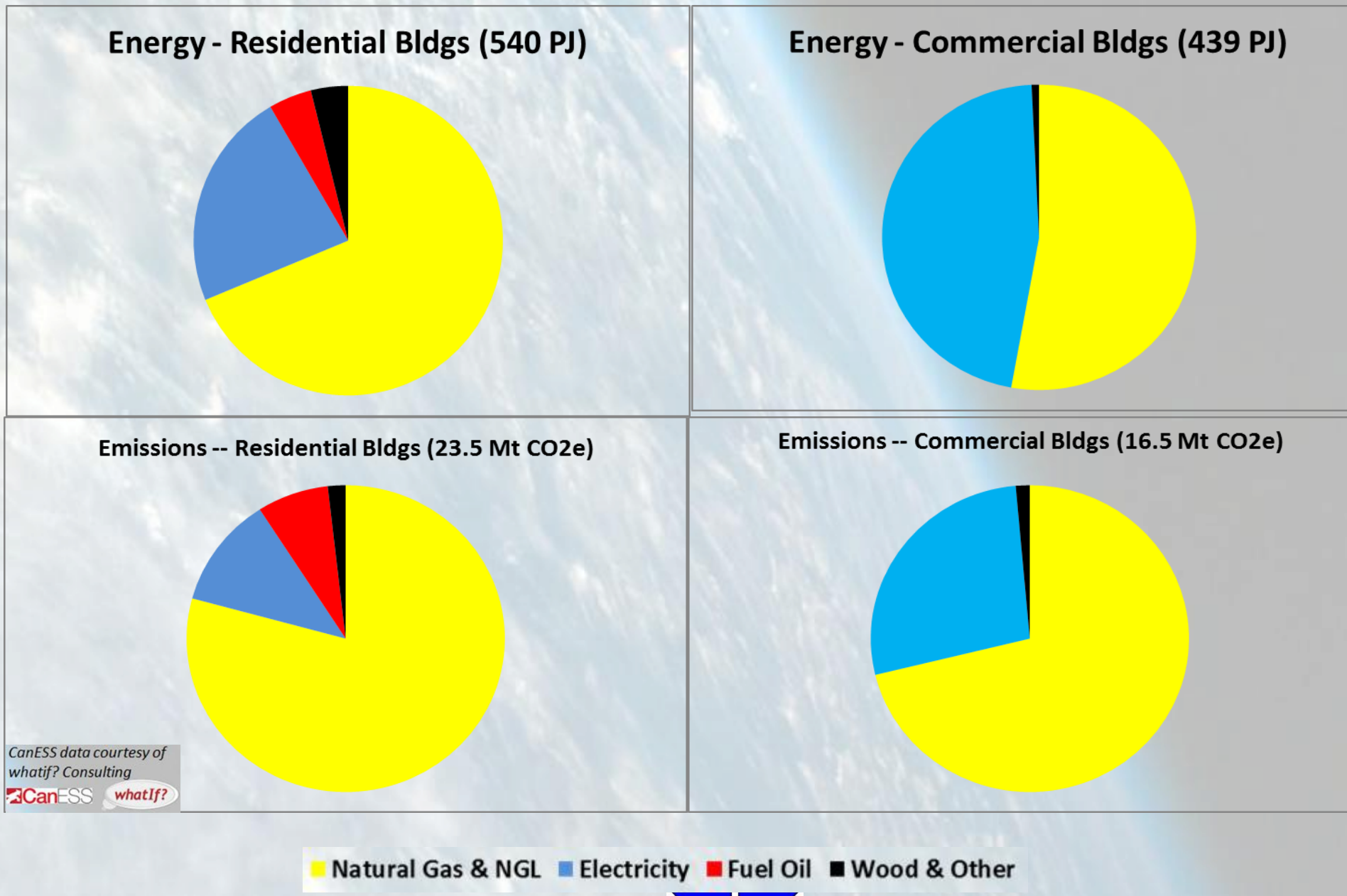
Energy - Residential Bldgs (540 PJ)
Energy - Commercial Bldgs (439 PJ)
Emissions -- Residential Bldgs (23.5 Mt CO2e)
Emissions -- Commercial Bldgs (16.5 Mt CO2e)
CanESS data courtesy of whatif? Consulting
CanESS
whatIf?
Natural Gas & NGL
Electricity
Fuel Oil
Wood & Other

Low Carbon Energy Futures – These five things must happen:

- **Efficiency, efficiency and then more efficiency**
- **Electricity's role expands into transportation and heat**
- **Decarbonize the electricity supply**
- **Sustainable production of biofuels**
- ***Innovation to reduce fuel and electricity in provision of human needs, amenities***

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Some wicked complications:

- Climate change and its deleterious impacts will increase throughout this century.
- The time frame for the transition is short compared to the inertia in the current energy system.
- The pre-tax price of fossil fuels will be permanently depressed in a low carbon future.
- The prices Canadian households and businesses currently pay for fuel and electricity, when converted to implied carbon prices, are in the range of $200-$500/tonne CO2eq and higher.

Some good news and opportunities:

- The technology is “available”
- Low carbon solutions yield co-benefits that are often of greater value to stakeholders than climate mitigation
- Building out a low carbon future will require a very large, skilled work force
- Infrastructure renewal presents an historic opportunity to implement resilient, low carbon solutions

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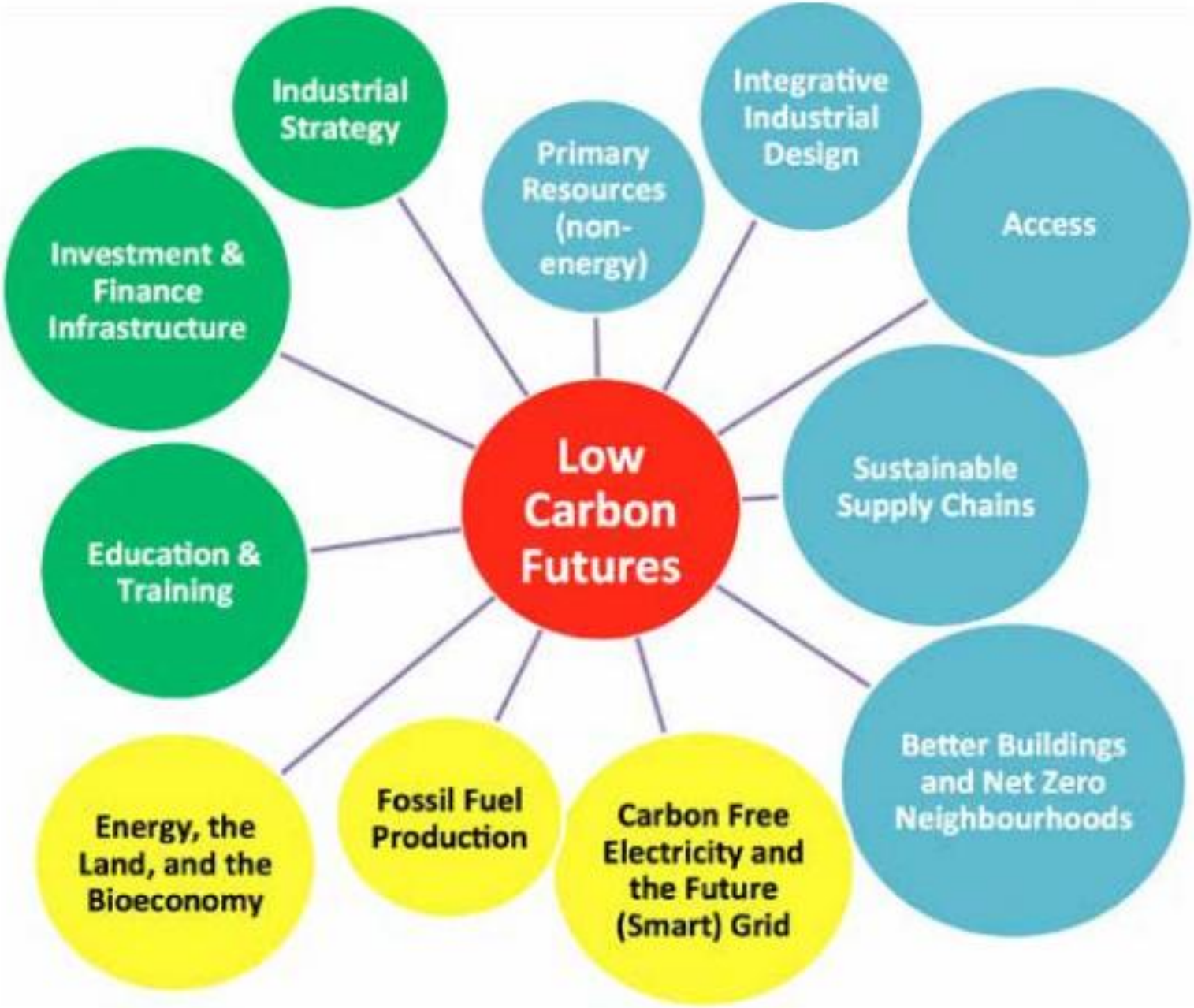
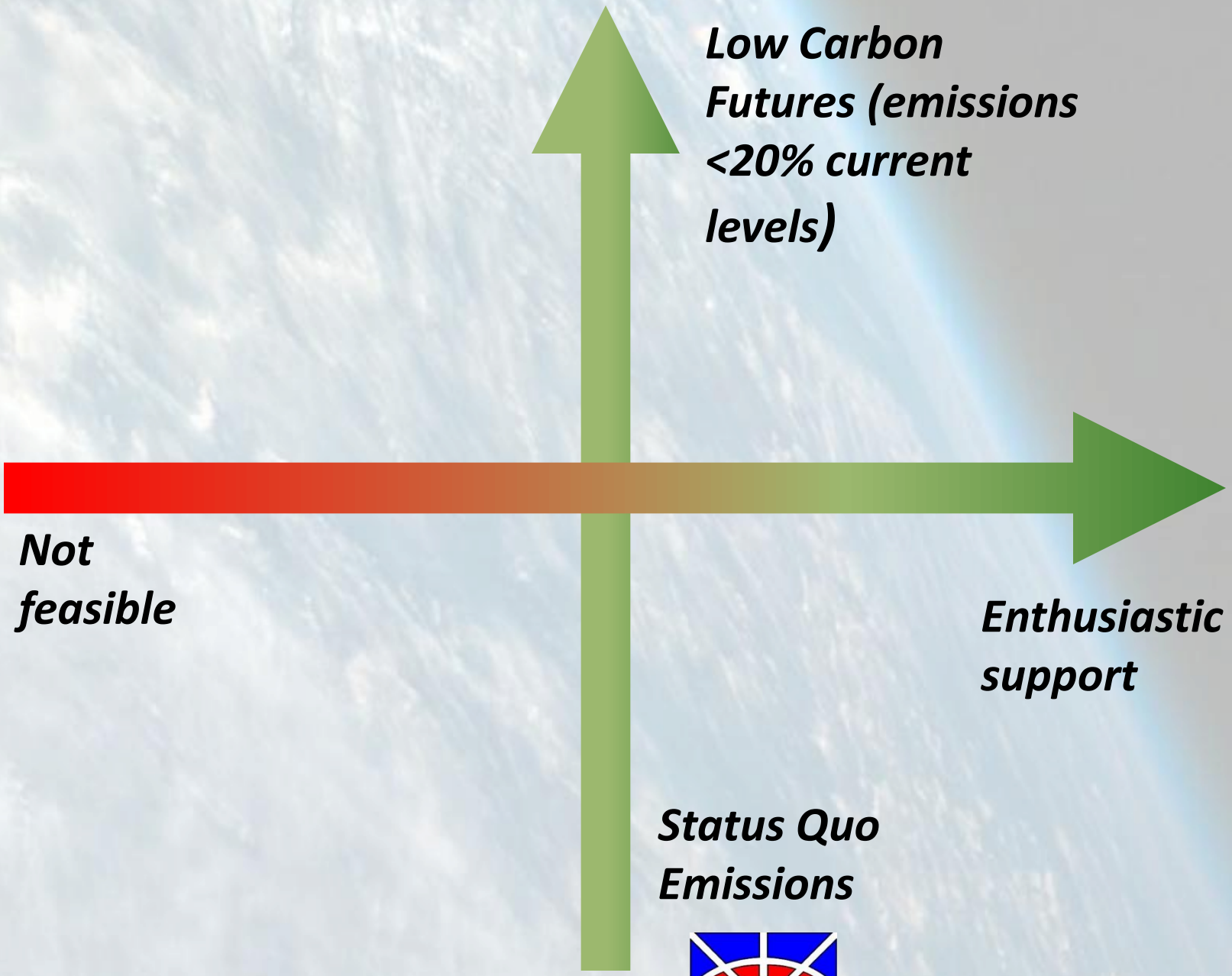
Key considerations:

- Transition to low carbon will take place simultaneously with other disruptive and far-reaching transitions, some helpful, some not.
- Capital intensity presents a challenge to policy and business models, but not the same thing as expensive.
- Innovation in financing and business strategies necessary to remove “first cost” barrier, and to resolve split incentives.
- Education and climate literacy will speed the transition.
- Low carbon solutions vary according to local circumstances; local agency and capacity, including in city halls, are essential.
- Human and institutional capacity development are constraints on the accelerated deployment of otherwise ready solutions.


Industrial Strategy
Investment & Finance Infrastructure
Education & Training
Primary Resources (non-energy)
Integrative Industrial Design
Access
Low Carbon Futures
Sustainable Supply Chains
Better Buildings and Net Zero Neighbourhoods
Energy, the Land, and the Bioeconomy
Fossil Fuel Production
Carbon Free Electricity and the Future (Smart) Grid



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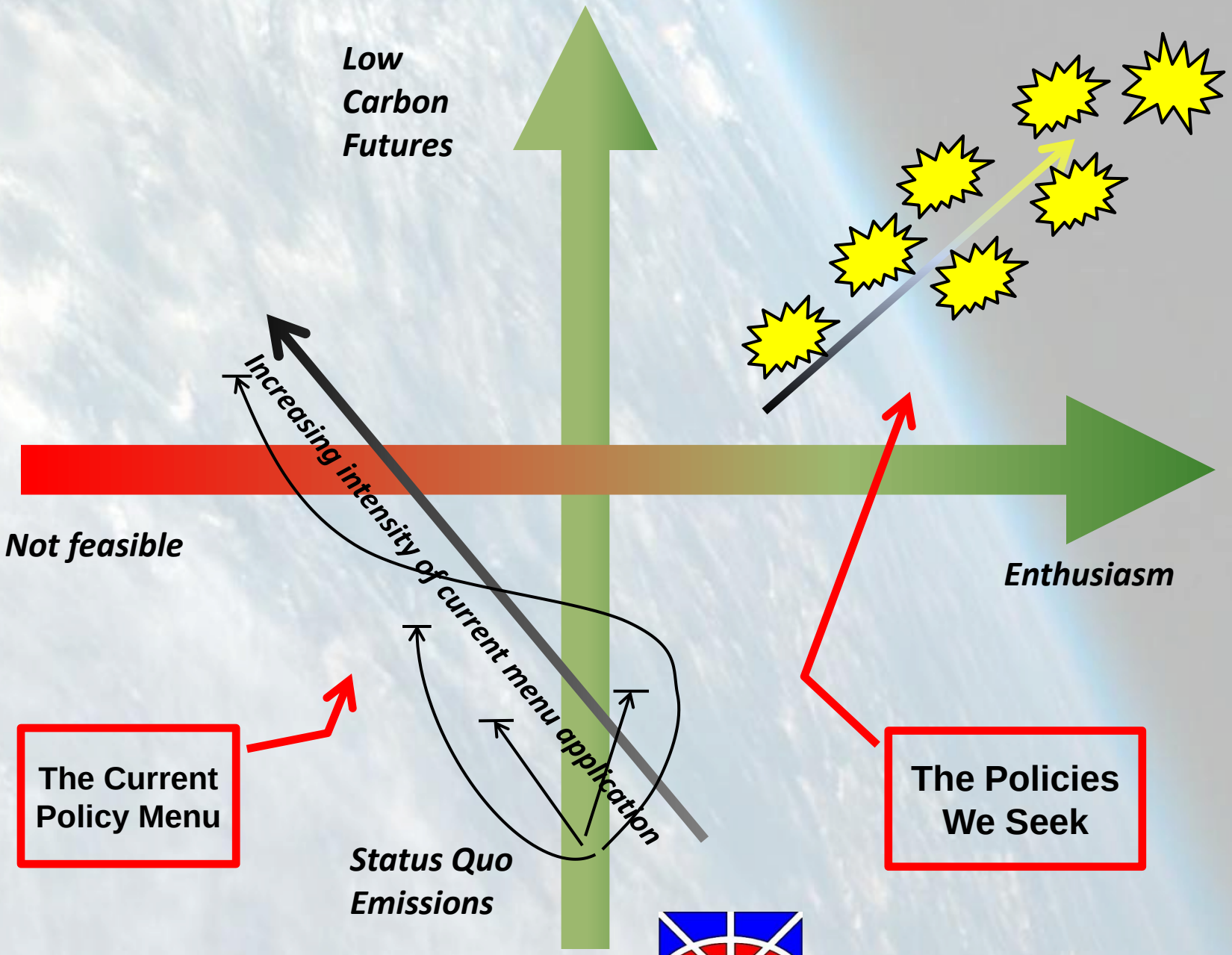

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Climate Change, Energy Efficiency & Social Housing
Connecting the Dots…

Stakeholders	Motivations
• Occupants and tenants • Tenant and neighbourhood associations • Landlords/building owners • Senior government departments • Local government, municipal service providers • Developers • Local businesses • School boards • Builders and construction industry • Trade unions • Colleges • Appliance and equipment suppliers • Banks and financers • Gas and electric utilities • Building technology suppliers • … • …	• Home ownership • Affordable access to housing • Comfort • Convenient access to stores and services • Densification • Secure tenure • Safety • Energy cost savings • Profit • Asset value • Client Satisfaction • Sales, investment and business opportunities • Resiliency, risk minimization • Energy cost savings • Air quality • Employment • Training and education • Local economic development • Climate mitigation • Climate adaptation • Increased supply of social housing • Public policy objectives… • Demand management opportunity

“Mixed-use, democratic neighborhoods with jobs and services nearby are the low-carbon gold standard.”

– Daniel Cohen

“It’s extremely important for us to also look at future investment and growth in affordable and social housing through an environmental lens.”

Catherine McKenna,
Minister of Environment and Climate Change

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