

Should Alberta Fast-Track a Shift Away from Hydrocarbon Fuels?

Every fuel choice trades off energy yield against consequence, and Alberta's economy runs on that trade-off.

Prompt: Alberta's government must decide whether to accelerate the phase-out of hydrocarbon fuels in favour of alternatives within the next decade. Using enthalpy data, combustion chemistry and STS reasoning, argue for or against this policy ([Outcome](#), [Outcome](#)).

Where to start

- Compare the molar enthalpy of combustion for a common hydrocarbon (such as octane or propane) against an alternative fuel (such as ethanol). What does the calorimetry data actually show about energy yield per mole ([Outcome](#), [Outcome](#))?
- Hydrocarbon combustion in an open system produces gaseous water and carbon dioxide. How does this compare to the reactants and products of photosynthesis and cellular respiration, and what does that comparison suggest about carbon cycling ([Outcome](#), [Outcome](#))?
- Technological solutions carry both intended and unintended consequences. What are the intended benefits of continued hydrocarbon use in Alberta, and what are the documented health and environmental consequences of that combustion ([Outcome](#))?
- How did early inhabitants of Alberta select fuels for their needs, and how does that selection process compare to how urban, rural and remote communities choose fuels today ([Outcome](#))?
- Explain, in general terms, where the chemical potential energy in hydrocarbons originated. Does this origin affect the argument for or against continued use ([Outcome](#))?

Stretch

Use Hess's law and standard enthalpies of formation to calculate the enthalpy change for the complete combustion of two candidate fuels, one hydrocarbon and one alternative. Present the calculations with correct SI units and significant digits, then use the numeric result as direct evidence in your argument ([Outcome](#), [Outcome](#), [Outcome](#)).