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# Freight Transportation: Towards a H<sub>2</sub> Economy in Canada

IISD H<sub>2</sub> Economy  
Forum

Oct. 27, 2020



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# NET-ZERO EMISSIONS BY 2050

...COMMITTED TO BY CANADA  
AND 72+ OTHER COUNTRIES\*

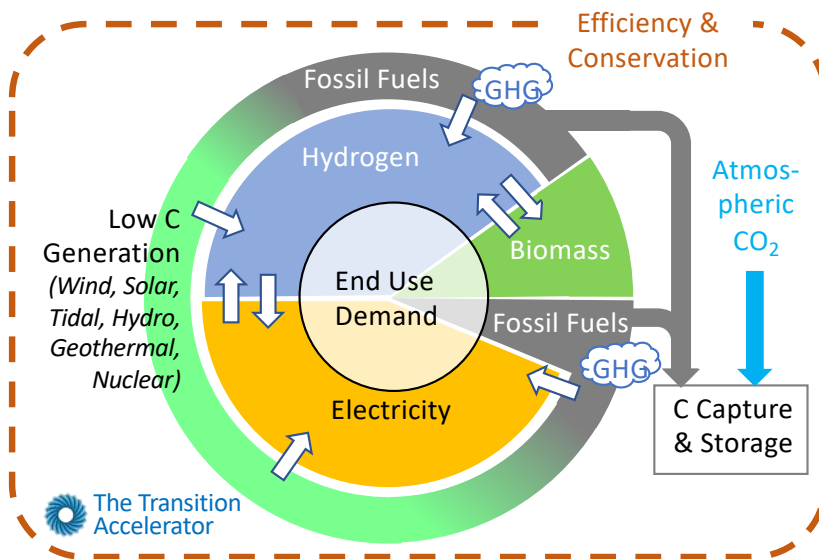
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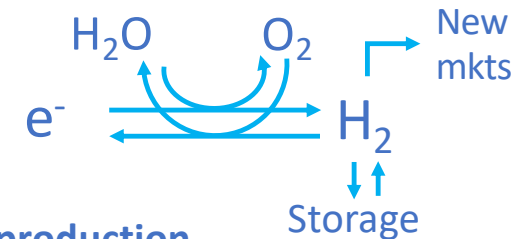
- ❑ *How can Canada 'win'?*
- ❑ *What are the best transition pathways?*

*Our vision for Canada's 'net-zero'  
energy system in 2050*



## Why Hydrogen (H<sub>2</sub>)?

1. **Some sectors need chemical, not electrical energy carriers**
  - Freight transport
  - Heavy Industry
  - Space Heating (*esp. cold regions, large buildings*)
2. **Complements low carbon electricity generation**
3. **Complements biofuel production**
4. **More resilient, interconnected energy system**  
*(One, not three energy systems of today)*



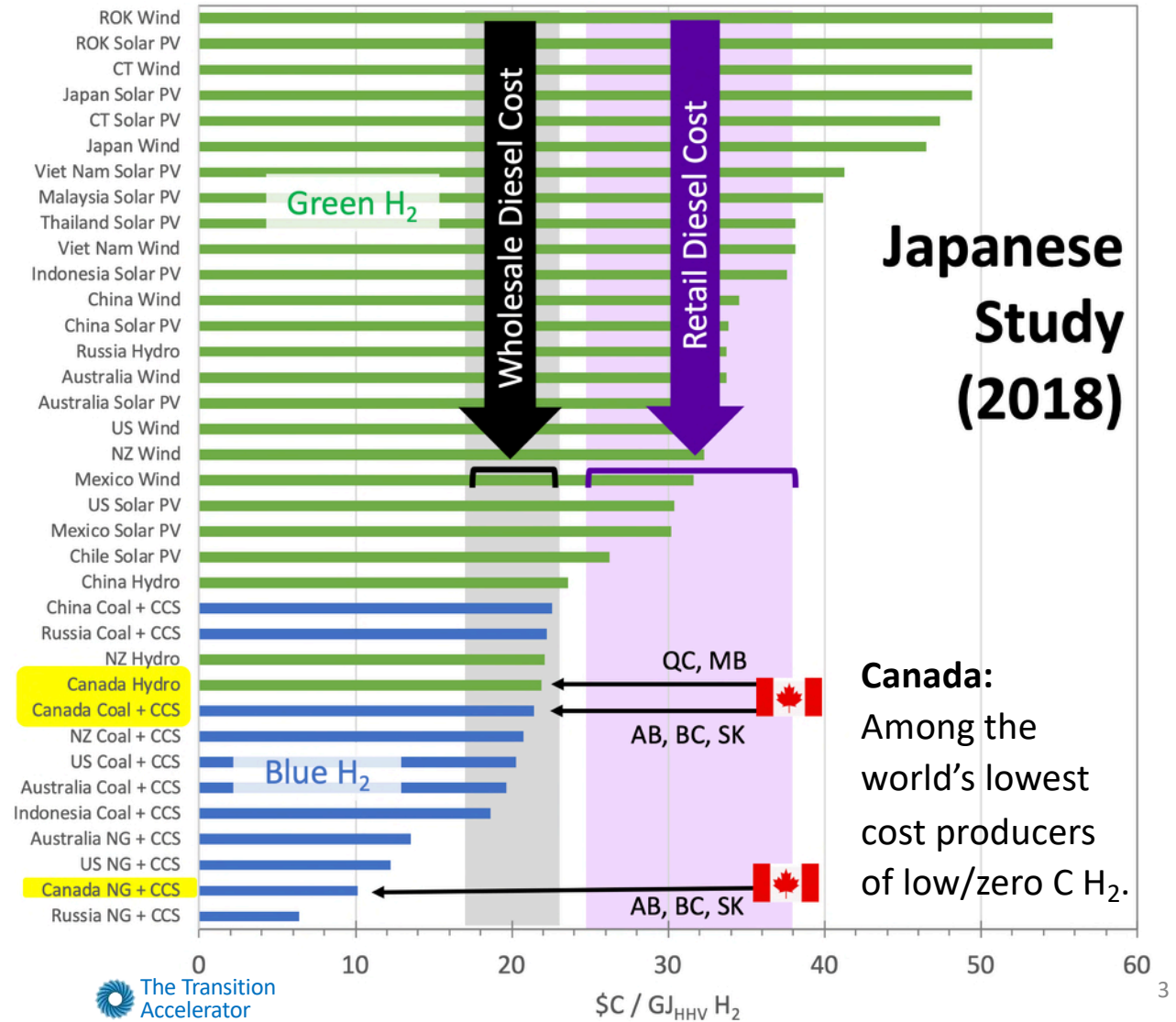


# Canada: Among the World's Lowest cost producers of 'Blue' & 'Green' H<sub>2</sub>

(Lifecycle GHGs: 1-3 kg CO<sub>2</sub>e/kg H<sub>2</sub>)

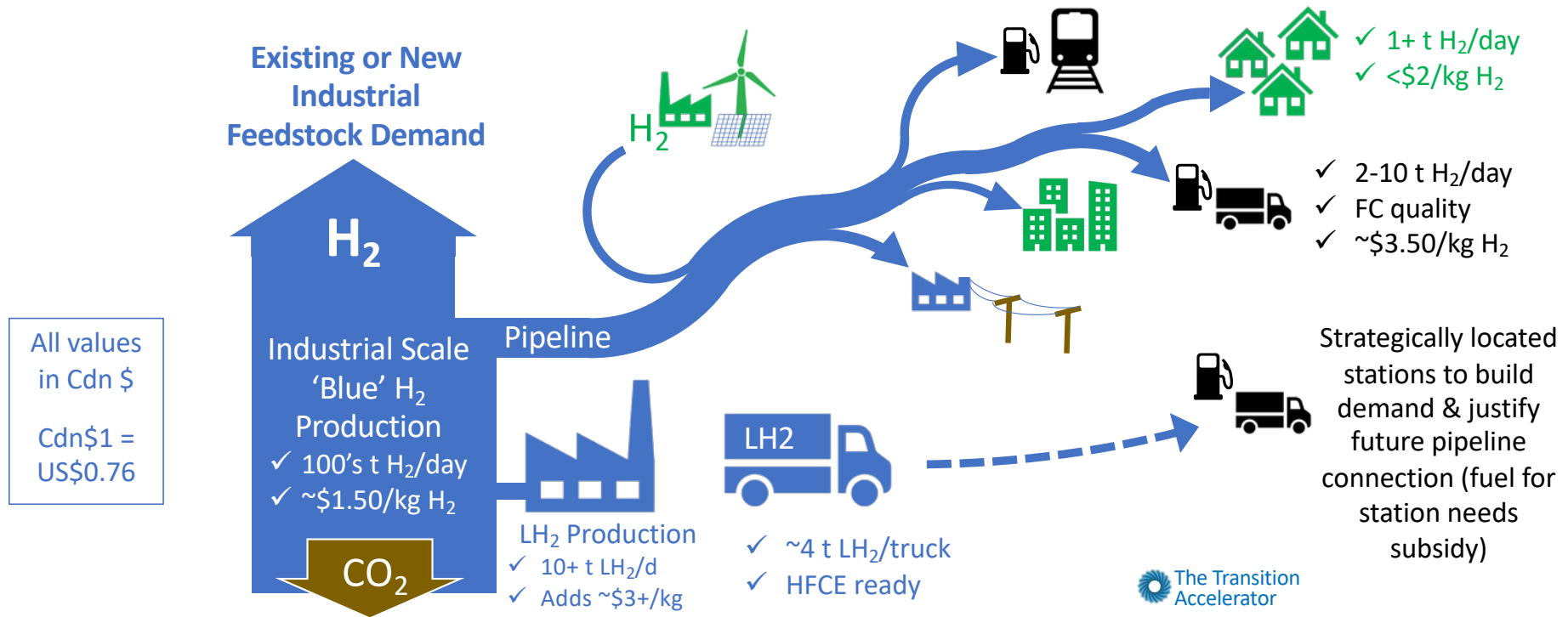
Alberta can make blue hydrogen at  
1/2 the wholesale (1/3<sup>rd</sup> the retail)  
cost of diesel

Adapted from Asia Pacific Energy Research Centre. 2018.  
Perspectives on H<sub>2</sub> in the APEC Region. (Figure 3.4)  
<https://aperc.ieej.or.jp/file/2018/9/12/Perspectives+on+Hydrogen+in+the+APEC+Region.pdf>





# Strategy to Grow the H<sub>2</sub> Economy in Alberta



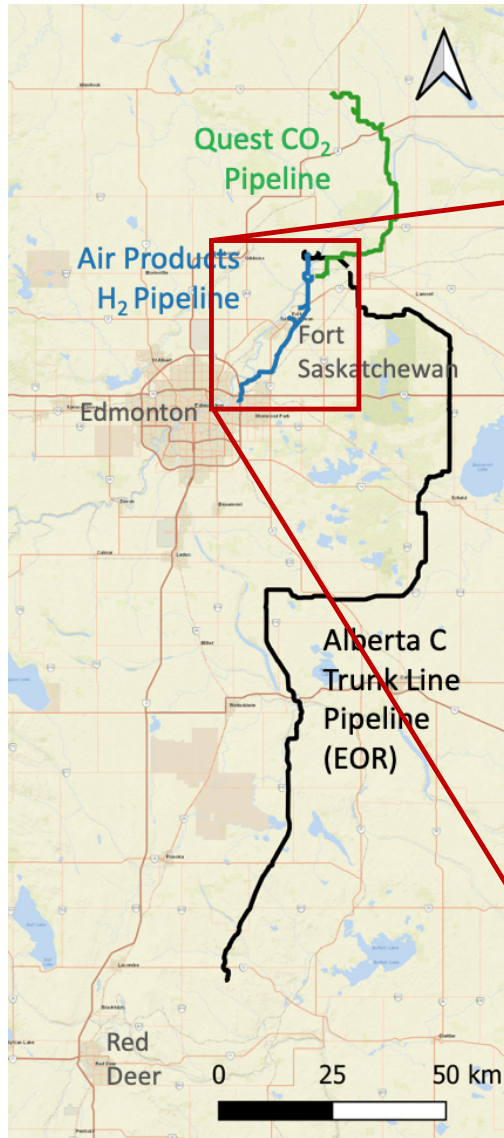
1. 'Piggy-back' on low cost industrial blue H<sub>2</sub> production.
2. Create substantial nearby markets for H<sub>2</sub>.
3. Pipeline connect supply & demand.
4. Attract H<sub>2</sub>-using industries & OEMs



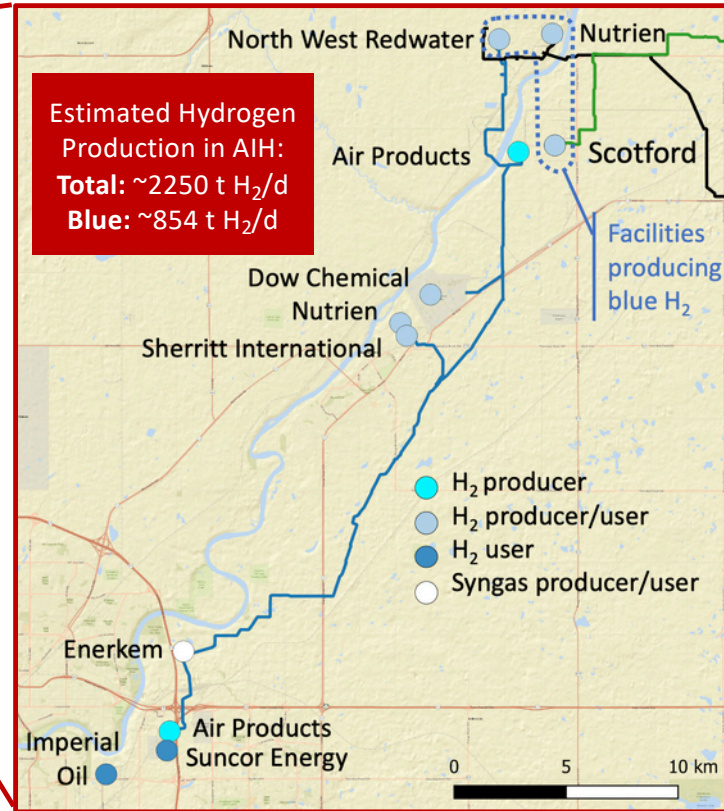
# Where to Start?

*Greater Edmonton Region in Alberta*

*[~1.1M people]*

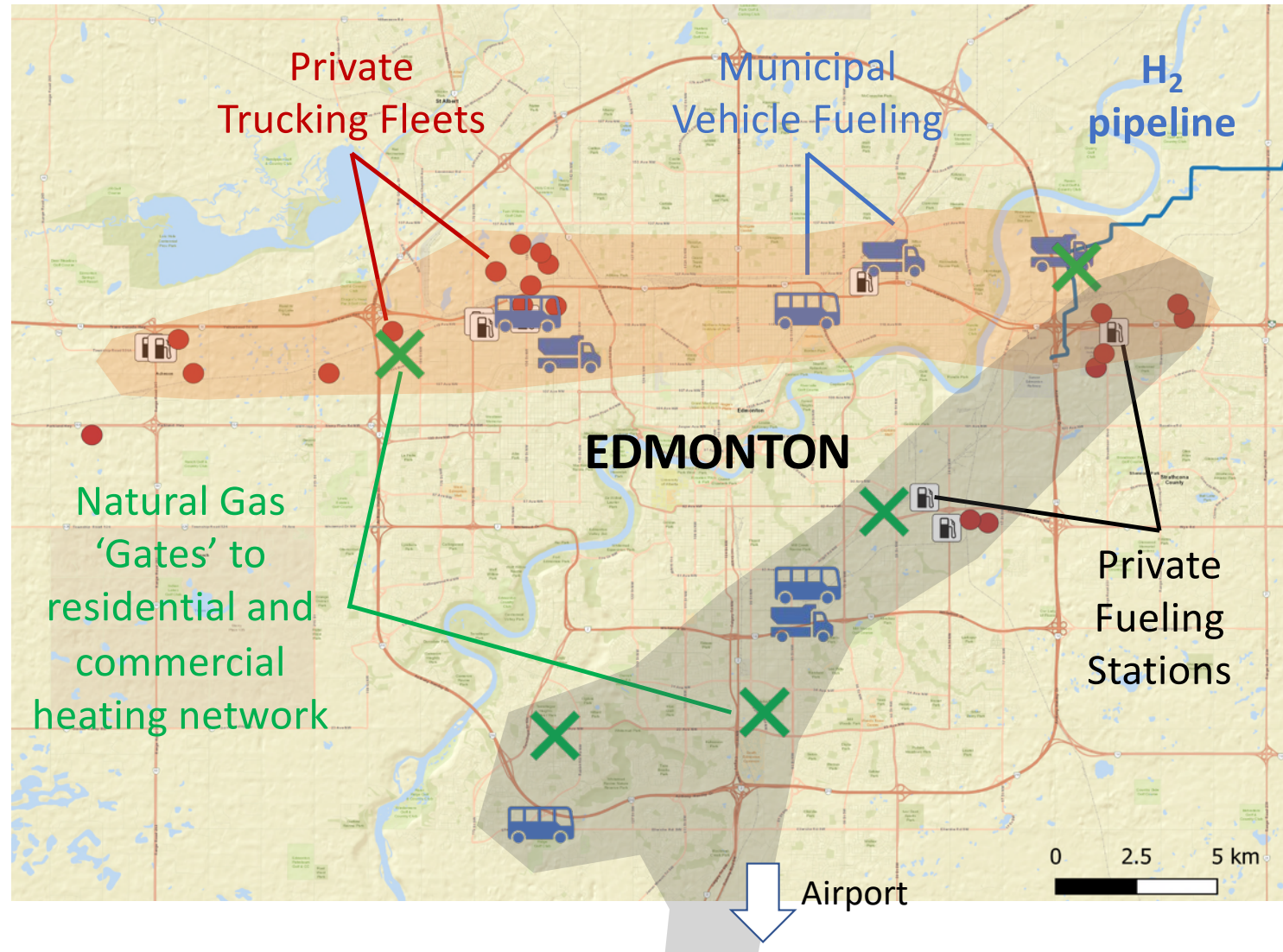


## THE ALBERTA INDUSTRIAL HEARTLAND (AIH)



 **The Major Potential Markets for the Hydrogen are on Two ~40 km Corridors**

**Fuel Market Size:**  
**2030:** ~400 t H<sub>2</sub>/d  
**2050:** 2200 t H<sub>2</sub>/day  
**+ Export**





# Initial Pilots to Engage Vehicle OEMs & Operators



**AMTA** Alberta Motor Transport Association

← LEAD BY

**AZETEC**  
ALBERTA ZERO-EMISSION TRUCK ELECTRIFICATION COLLABORATION



- Two HFCE HD (63.5 t<sub>gross</sub>) vehicles
- Edmonton → Calgary return;
- 700 km between refueling
- Road trials: Sept '21- Mar '23



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## H<sub>2</sub>-Diesel bi-fuel Project



- Retrofit of diesel vehicles to take ~40% of energy from H<sub>2</sub>;
- Important 'bridge' technology;
- Valuable in creating fueling station demand for H<sub>2</sub>.

## HFCE Municipal Bus Fleet Project

## H<sub>2</sub> Train Project



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Thank you

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