

Session 1:

Evaluating Hydrogen
Opportunities
For BC First Nations

Why Hydrogen?

- Economic opportunity
- Energy sovereignty



Regional Considerations

- Transportation corridors or ports
- Local industry (mines, forestry, oil & gas, trucking, pulp and paper)
- Production limitations (feedstock, alternatives, power gen)



Production Considerations

- Feedstock
- Power
- Infrastructure
- Cost, funding, and access to capital
- Carbon intensity

Production Considerations

Feedstock:

- Electrolysis - purified water
- Reformation - natural gas
- Pyrolysis - natural gas or appropriate biomass



Production Considerations

Power:

- Electrolysis - **more electricity**
 - 50-55 kWh of electricity → 1 kg of H₂
- Reformation/Pyrolysis - **less electricity**
 - ~2 kWh of electricity → 1 kg of H₂



Production Considerations

Infrastructure:

- Electrolysis (green) - **electrolyzer, water treatment**
- Pyrolysis (turquoise) - **pyrolysis reactor**
- Reformation (blue) - **reformer, CCUS**
- All - **compression, storage, transport infrastructure**
- Also consider end-use infrastructure



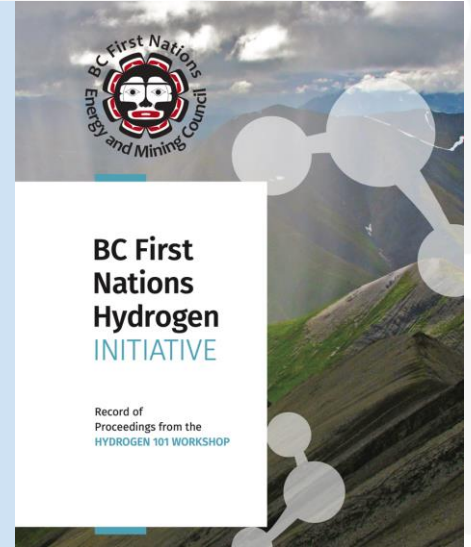
Production Considerations

Cost:

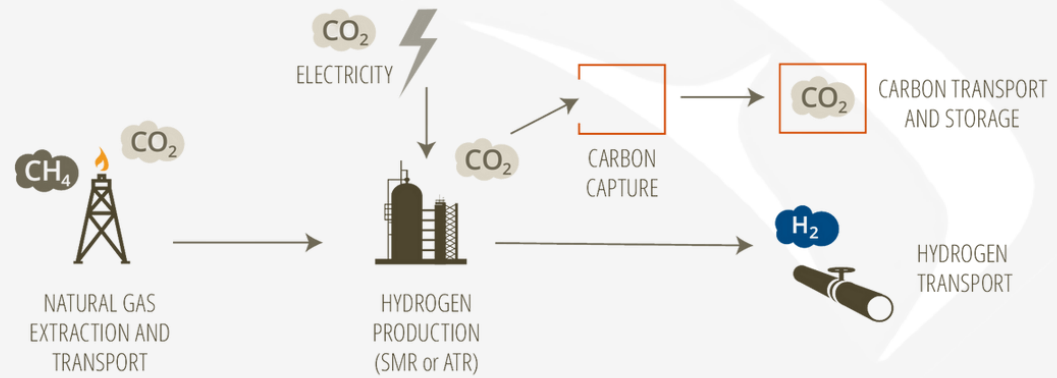
- Production: feedstock, capital, operating
 - Carbon pricing (fossil feedstocks)
- Transportation

Funding

BC Community Climate Funding Guide

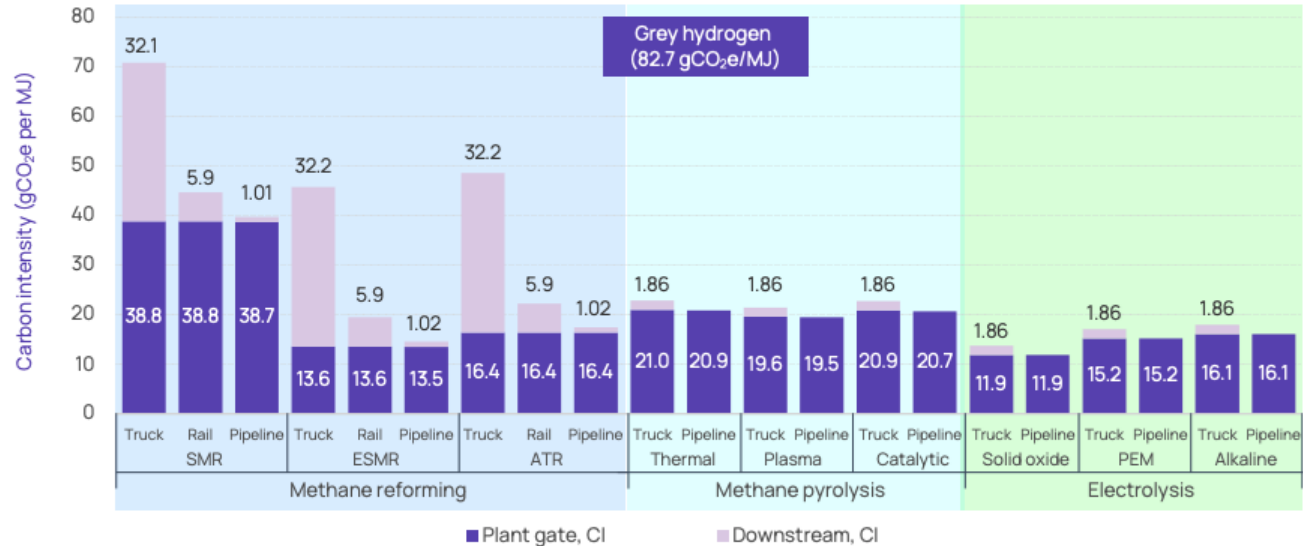


Production Considerations



Carbon intensity

- Consider the life cycle emissions of production pathways AND the intended use of hydrogen



Images: Pembina Institute (upper); BC CICE (lower)

Risk Analysis

Environmental and Safety Risk Analysis

- Hydrogen as a GHG
- Combustion
- Differences with methanol, ammonia

Sensitivity Analysis

- Take note of all assumptions
 - Energy requirements, carbon intensity, cost, projected demand for hydrogen, etc.

Summary of Considerations

- Why is there interest?
 - Energy sovereignty or economic opportunity?
 - Both?
- What are the alternative energy generation options?
- What is notable about our region?
- Production considerations
 - Feedstock availability
 - Power
 - Infrastructure
 - Cost
 - Carbon intensity
- What are the risks and assumptions we've made?

NEXT: What else is a factor?

Coffee break
(15 minutes)

Session 1 continued:

Hydrogen project
decision-making pathway

Before implementing a hydrogen project, what factors are important to consider for your Nation?

Political/Governance

- Ex. Political structures that may impact projects (e.g., Indian Act)

Social/Cultural

- Ex. Concerns around traditional cultural activities or specific sites, employment and training

Legal

- Ex. Community level provincial/federal barriers

Environmental

- Ex. Global impact of hydrogen economy on the environment

Lunch break
(return at 12:45)

Q: What is the primary byproduct of producing hydrogen through pyrolysis (turquoise hydrogen)?