



# HydroGEN: Hydrogen and Natural Gas Co-generation Plant

UBC

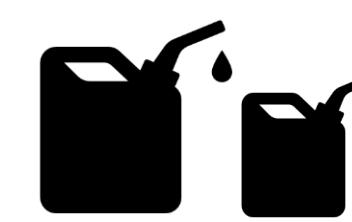
CHBE

Nicolas Bednar, John Mendoza, Cameron Nagle, Dhruv Banerjee, Harsh Singh, Jade Henzie, Sara Bozorgzad

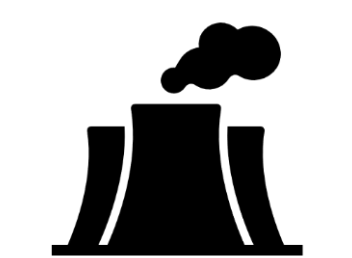
## Background



**Plant Location:** Clarke Lake, BC



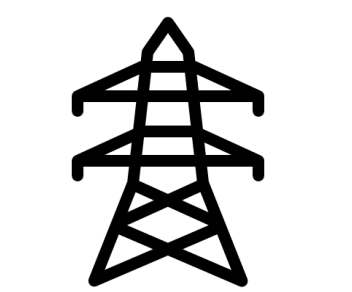
**Fuel Blend:** 25% H<sub>2</sub> and 75% NG (volumetric basis)



**CO<sub>2</sub> Capture:** H<sub>2</sub> gas blend, Post-Combustion MEA Absorption, Stripping, and Condensing for underground storage



**NO<sub>x</sub> Control:** Low NO<sub>x</sub> burner, SCR

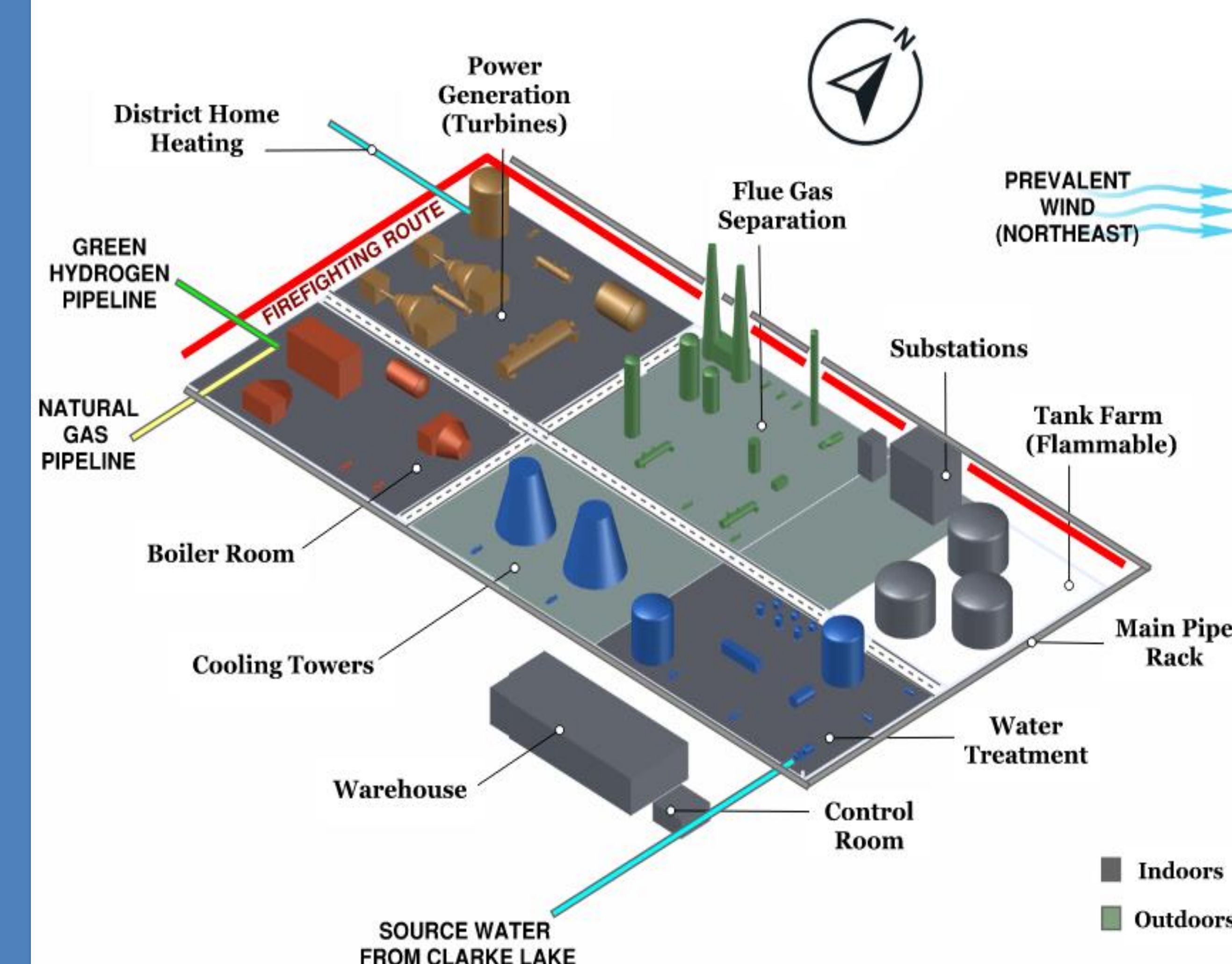


**50MW Electricity & 7.5 MW District Home Heating**

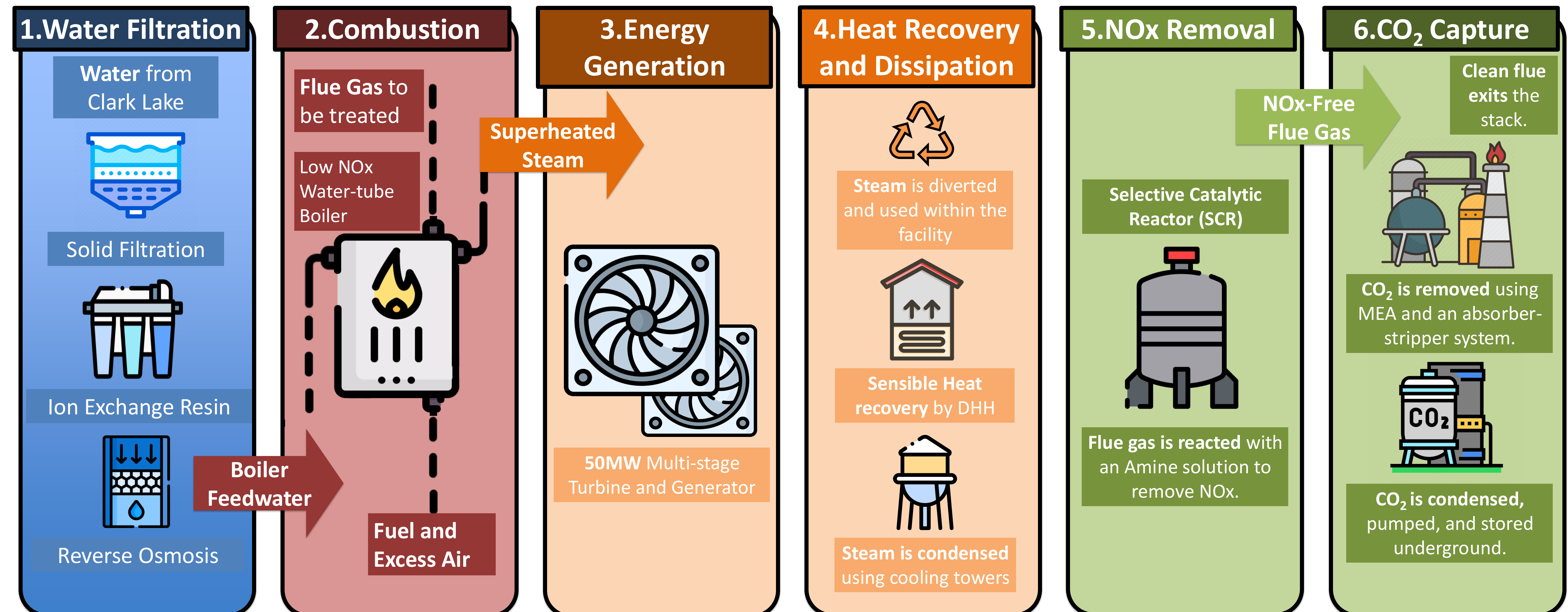
## Plant Layout

### Location Features:

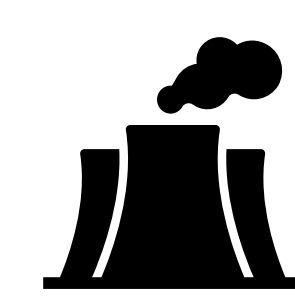
- ✓ Plant Footprint: ~30,000 m<sup>2</sup> (with space for expansion)
- ✓ Source water from Clarke Lake in Northeastern Rockies, BC
- ✓ Depleted oil wells for potential CO<sub>2</sub> sequestration
- ✓ Target electricity consumer is Alberta, Canada
- ✓ Close proximity to Fort Nelson, BC for District Home Heating Services



## Process Description



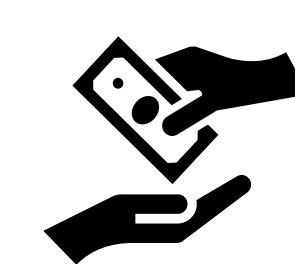
## Economics



**Lifetime:**  
30 Years

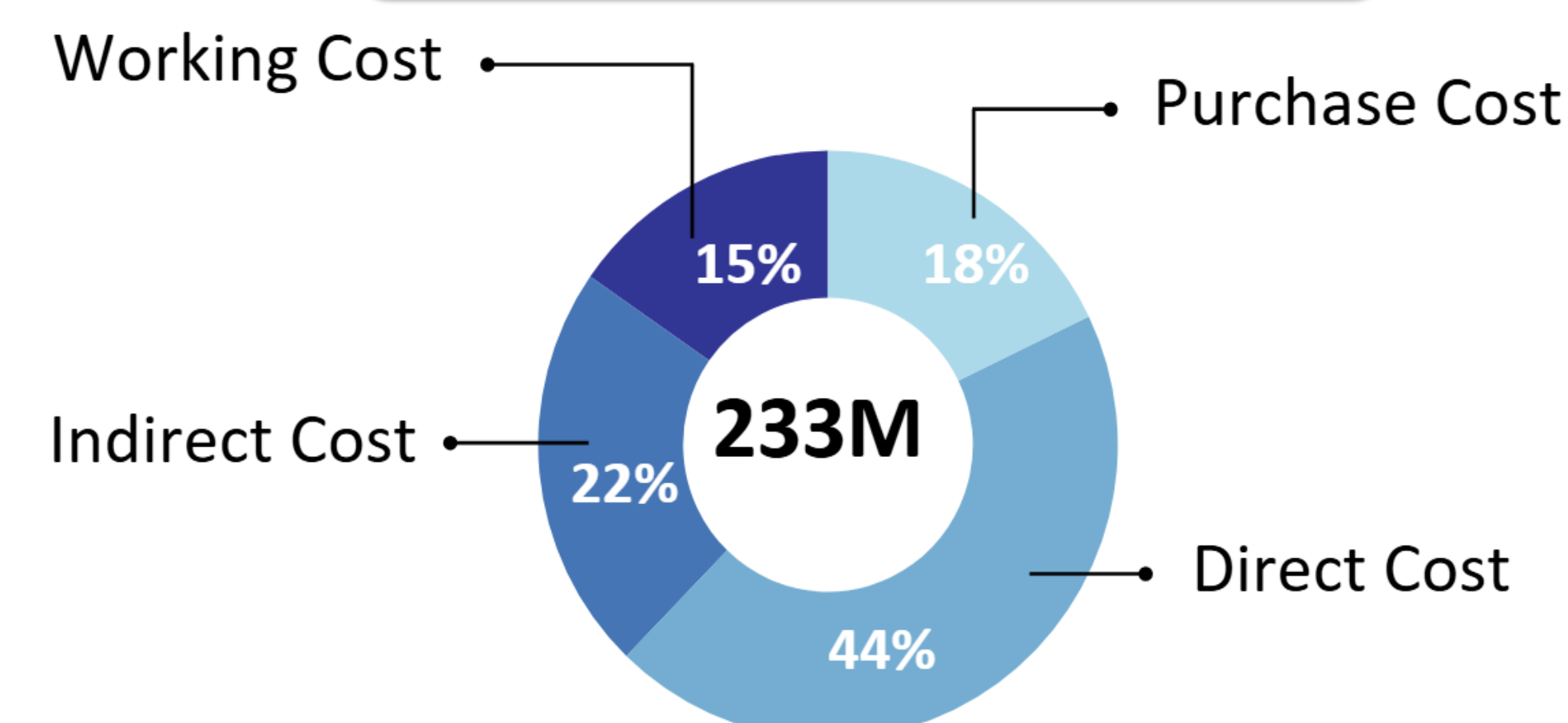


**Construction:**  
2 Years

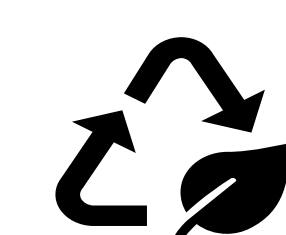
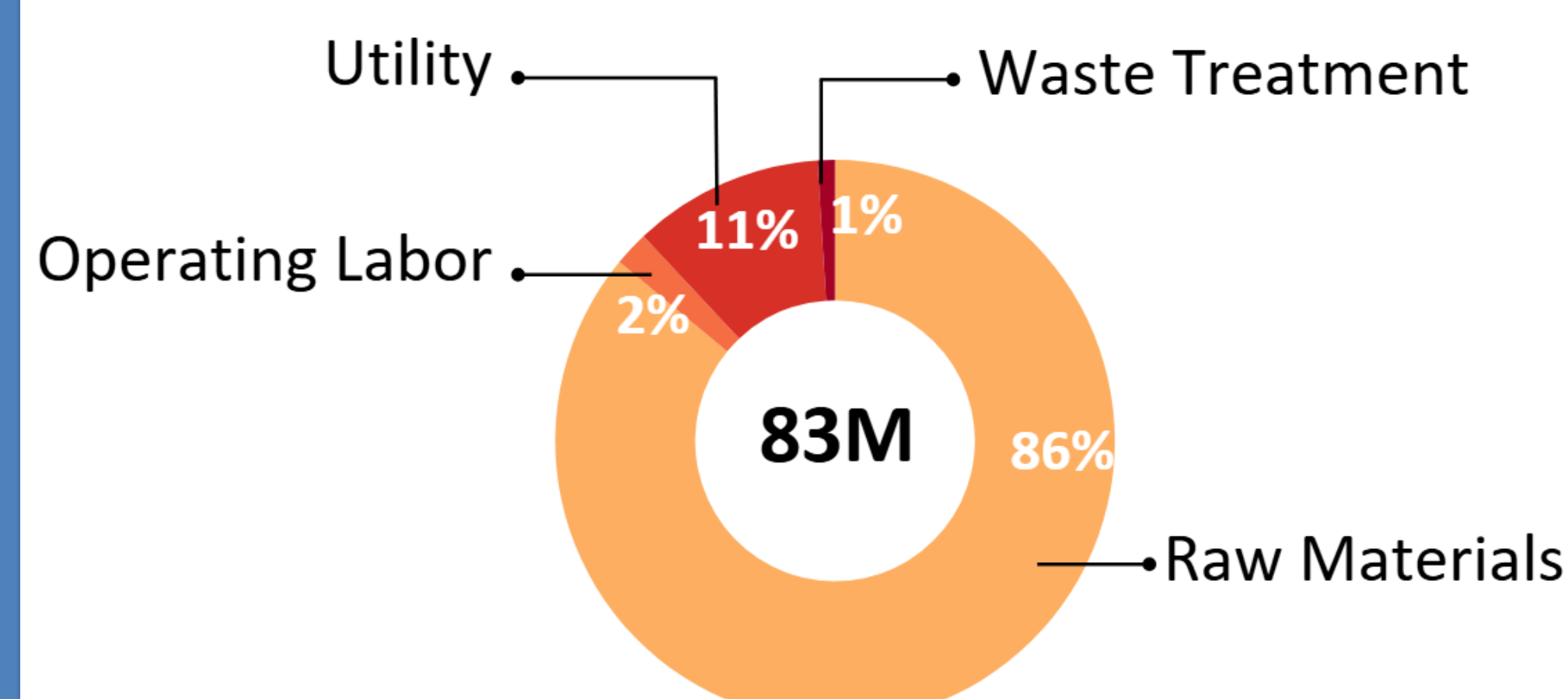


**CAPEX Loan:**  
15 Years

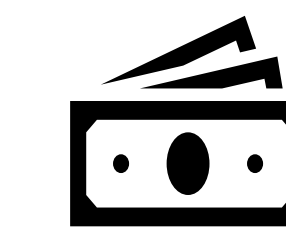
### Capital Investment



### Operational Expenses



**Green Hydrogen:**  
\$5000/tonne



**Revenue:**  
\$52M/year

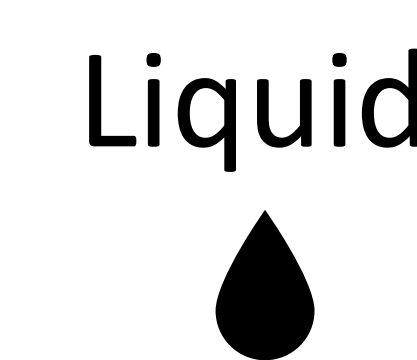
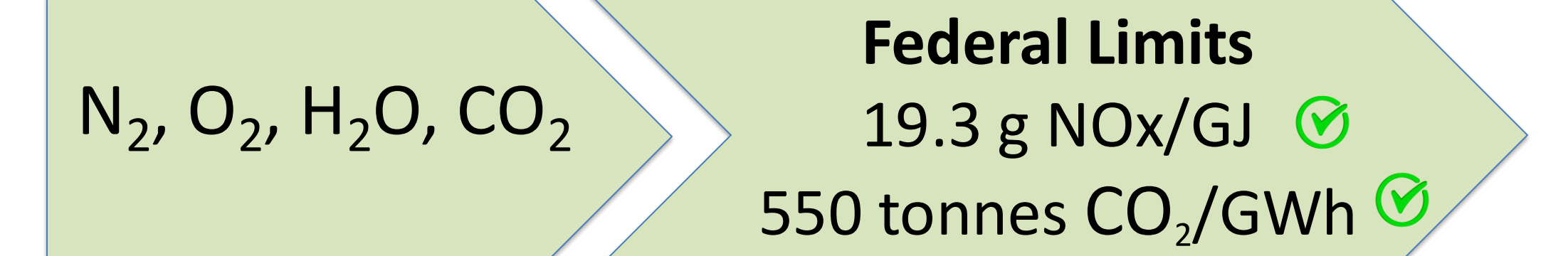


**Breakdown:**  
90% Electricity  
10% DHH

## Environmental

**Land Use:** The plant is located 40 km away from Fort Nelson First Nation (FNFN)

**Water Source:** Permitting will be acquired from BC Ministry of Water, Land and Resource Stewardship to remove water from Clarke Lake



## Acknowledgements

Petros Englezos, Sergio Berreta, Jonathan Verrett, Jeremy Zhao, Keith Timms, Danica Josefchak

