



Methanol Synthesis from the Gasification of Polyethylene Terephthalate (PET)



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INTRODUCTION

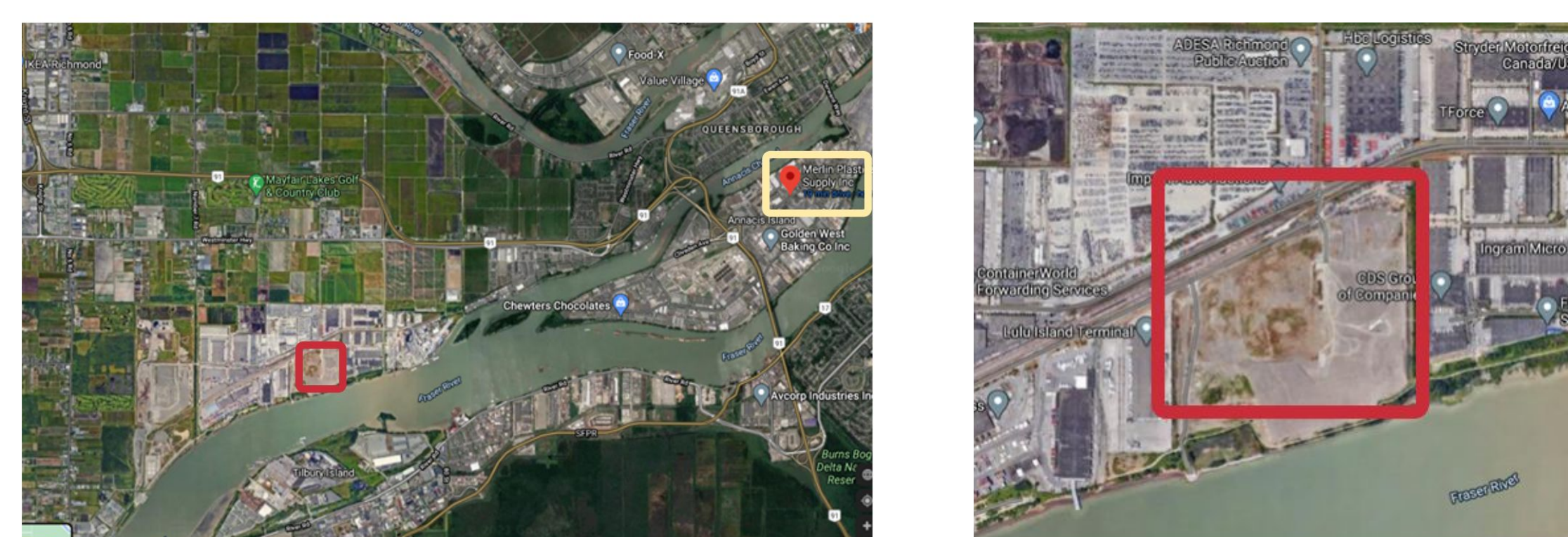
- 381 million tonnes of plastic wastes per year are produced globally - projected to double by 2034
- 9% are recycled and 50% are single-use plastics
- Global demand for methanol reached 20.4 billion USD in 2020, projected to reach 26.6 billion USD in 2025
- Used in the automotive industry - gasoline blending & biodiesel
- Used in the chemical industry - acetic acid, formaldehyde, dimethyl ether

PROJECT OVERVIEW

Feedstock	Product	Plant Capacity
PET flakes Feed rate: 40,000 tonnes/year	Methanol, CH ₃ OH Market value: 428 USD/tonne	Production Capacity: 35,000 tonnes/year of methanol

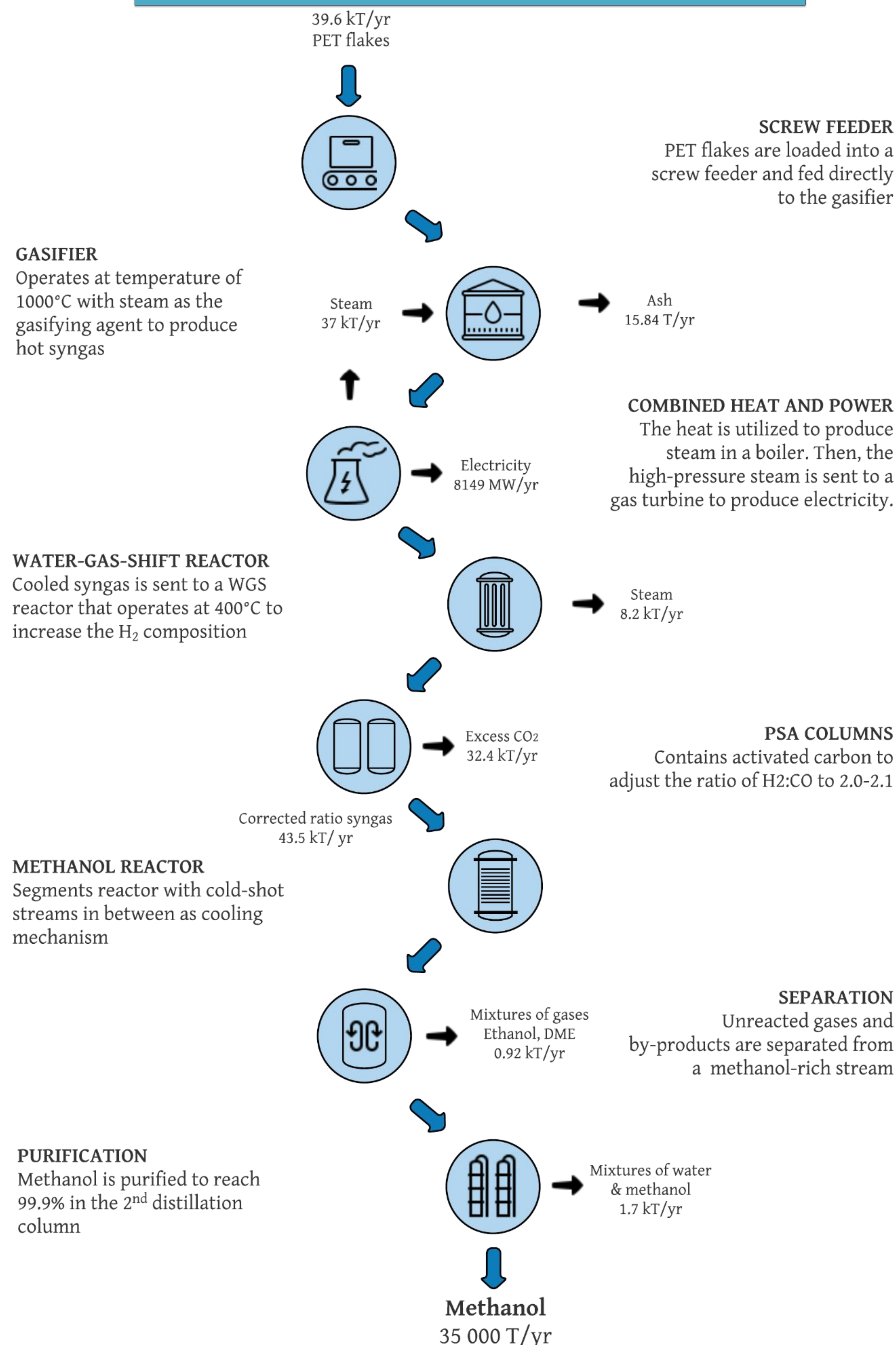


LOCATION & SUPPLIER



- Location: Industrial area in Richmond
- Ease of transportation of materials and products from the feedstock supplier
- Merlin Plastics located in New Westminster, BC ~ 8.7 km away from the plant.

PROCESS DESCRIPTION



ENVIRONMENTAL CONSIDERATIONS

- Without treatment:
- Liquid waste → Diluted alcohols (Methanol + Ethanol + Water)
 - Gas waste → CO + Methanol + Ethanol + Dimethyl ether
 - Solid waste → Fly ash

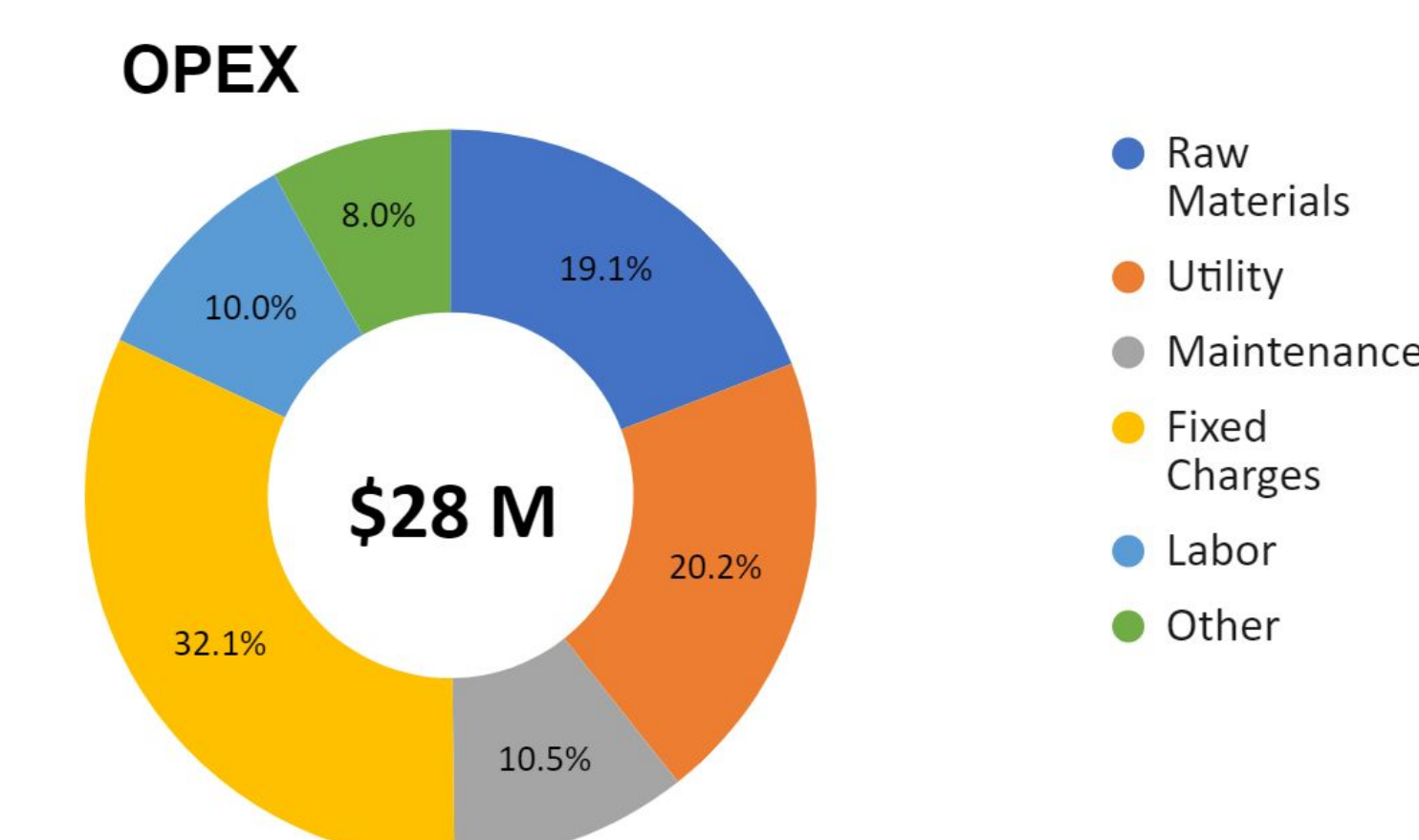
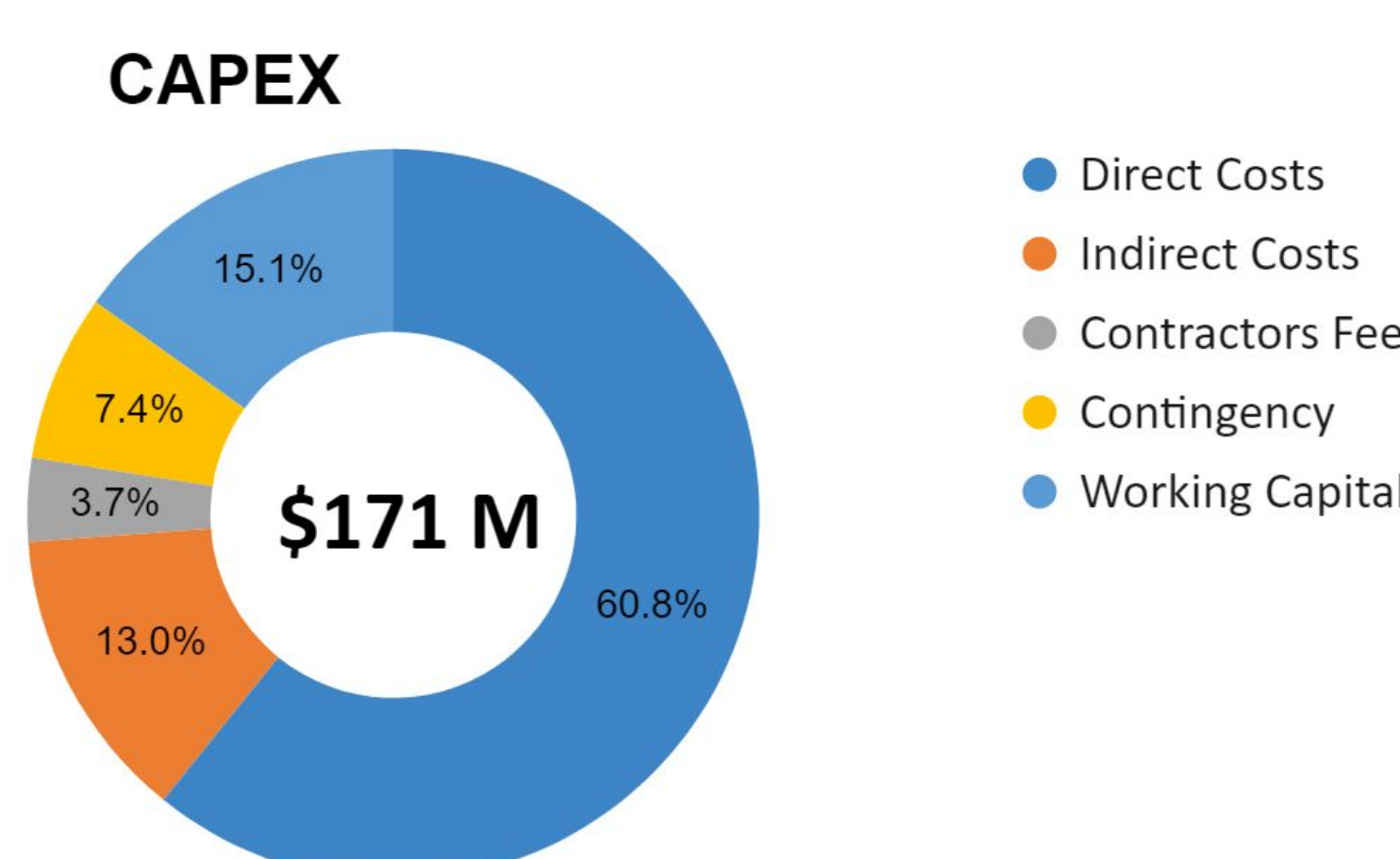
- Combust gas and liquid waste:
- Hot gases are used to generate high pressure and temperature steam
 - Emissions are primarily CO₂ + Water

- Steam is used to generate electricity using a turbine:
- Power generated = 600 kW
 - Savings = \$375,000 per year

- 16 tonnes of Ash produced per year
- Disposed at approved landfills

- 50,000 tonnes of CO₂ produced per year
- Sent for Carbon Capture

ECONOMIC ANALYSIS



\$15 M Annual Revenue

950 USD/MT Break Even Price



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