

Desulfurization of Gasoline Using Aqueous Phase of Acids

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Project Background

Objective

Retrofit an existing crude oil refinery to allow for a more effective and profitable desulfurization process to produce a higher octane number gasoline product

Process Innovations

- Catalyst can be recycled up to 4 times
- Condensation of thiophenes takes place at lower operating conditions to reduce OPEX
- Polymerization of olefins is minimised in the final product (Higher Octane Rating)

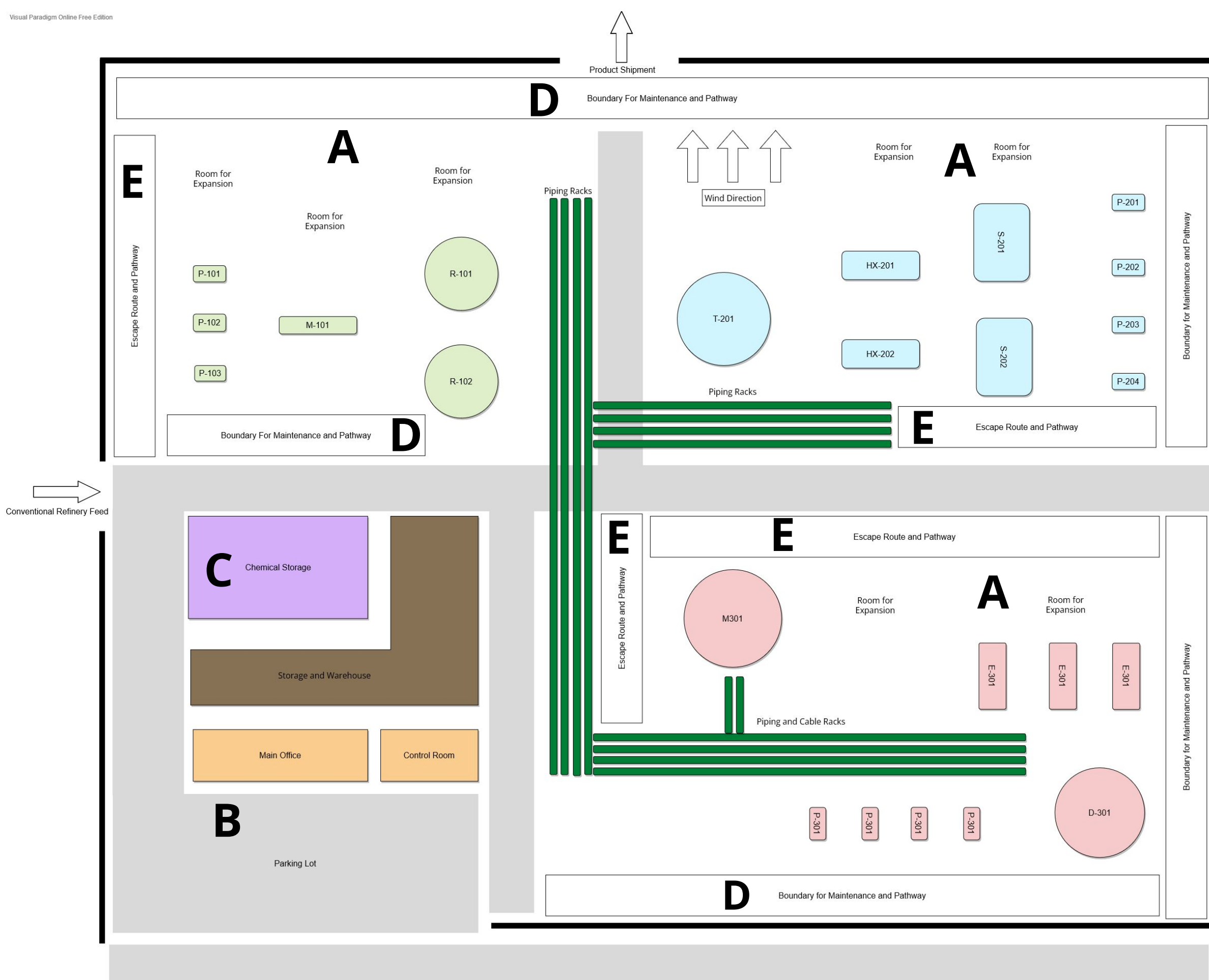
Capacity

12,000 barrels of oil per day

Location

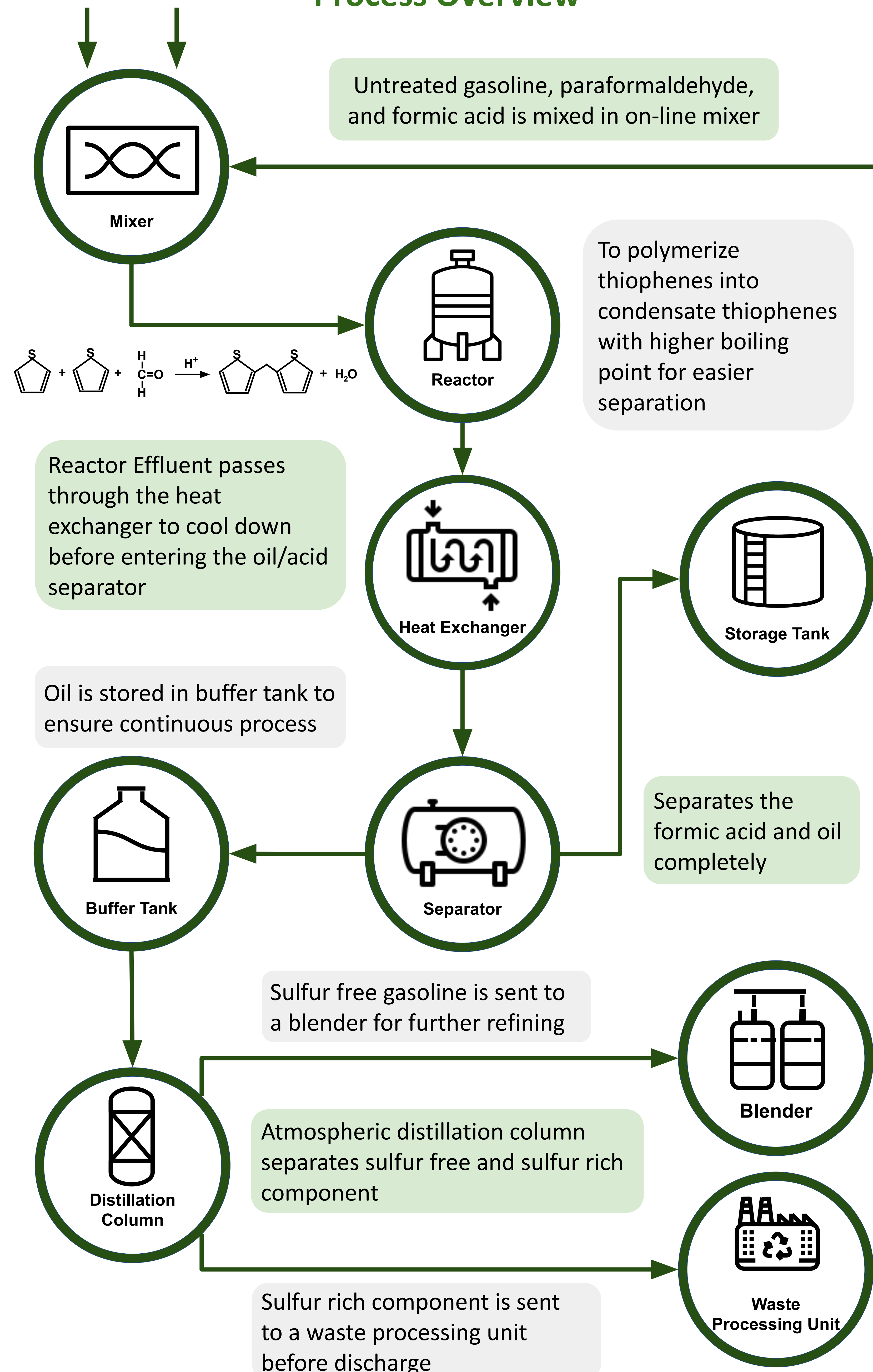
Prince George, British Columbia

Plant Layout



- A. Main process area
- B. Administration and storage area
- C. Chemical storage area
- D. Maintenance and general pathway
- E. Escape route

Process Overview



Environmental Considerations



Environmental Assessment Act

- Must be deemed reviewable project under Environmental Assessment Act



Oil and Gas Operation Regulations:

- Canada Petroleum Resources Act
- Canada Oil and Gas Operations Act
- National Energy Board Act.... etc.



Permit and Approval Fees Regulation

- Assessed annual fee based on emission type and quantity



Emissions Information:

- Combusted Sulphur, Sulphur Oxides, NOx gases must fall into regulated quantity
- Waste formic acid sent to chemical treatment before discharge/ recycling (Federal Petroleum Refinery Liquid Effluent Regulations)

Economic Assessment

Total Capital Cost (TCI): \$19.62 Million CAD

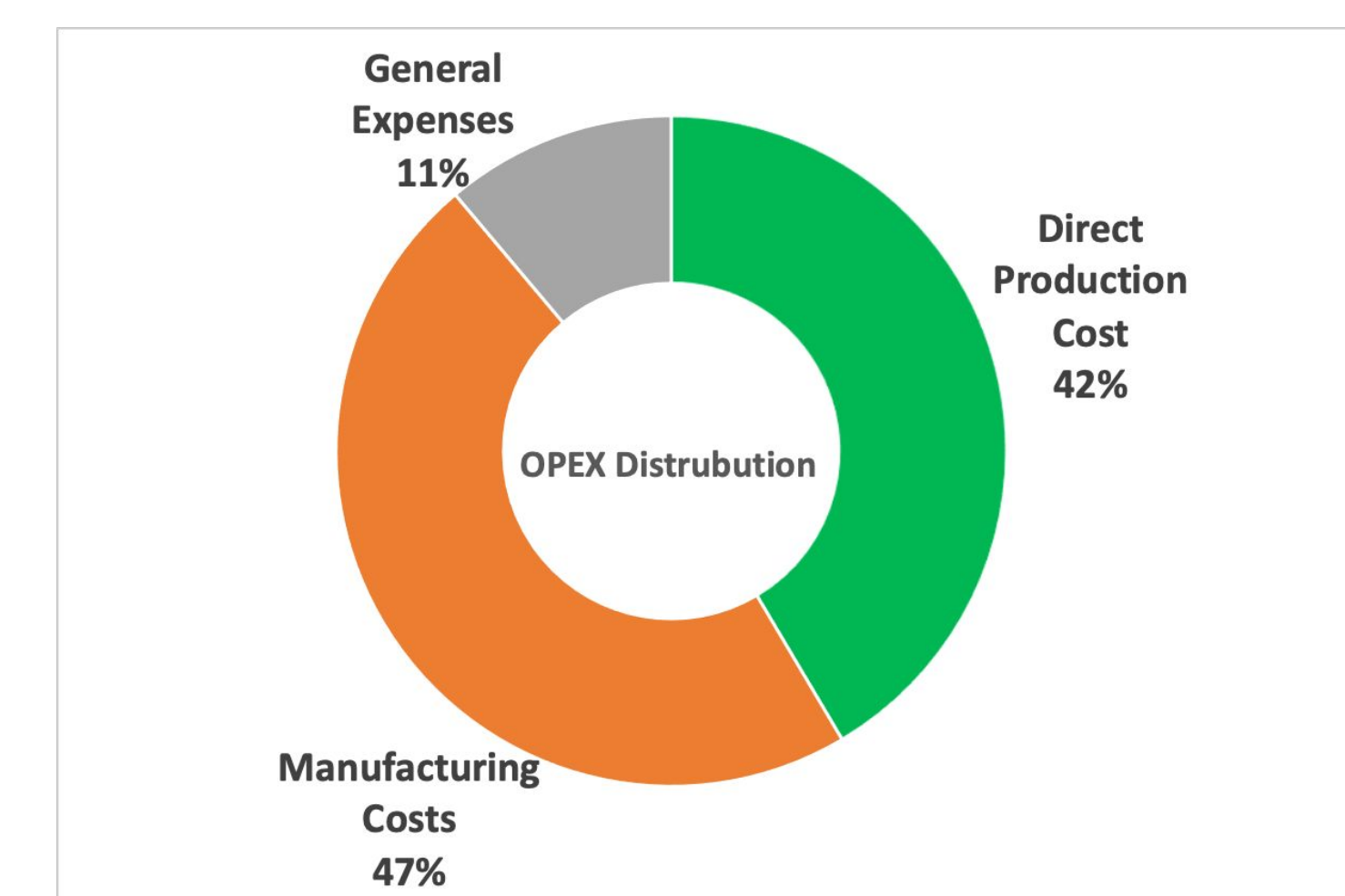
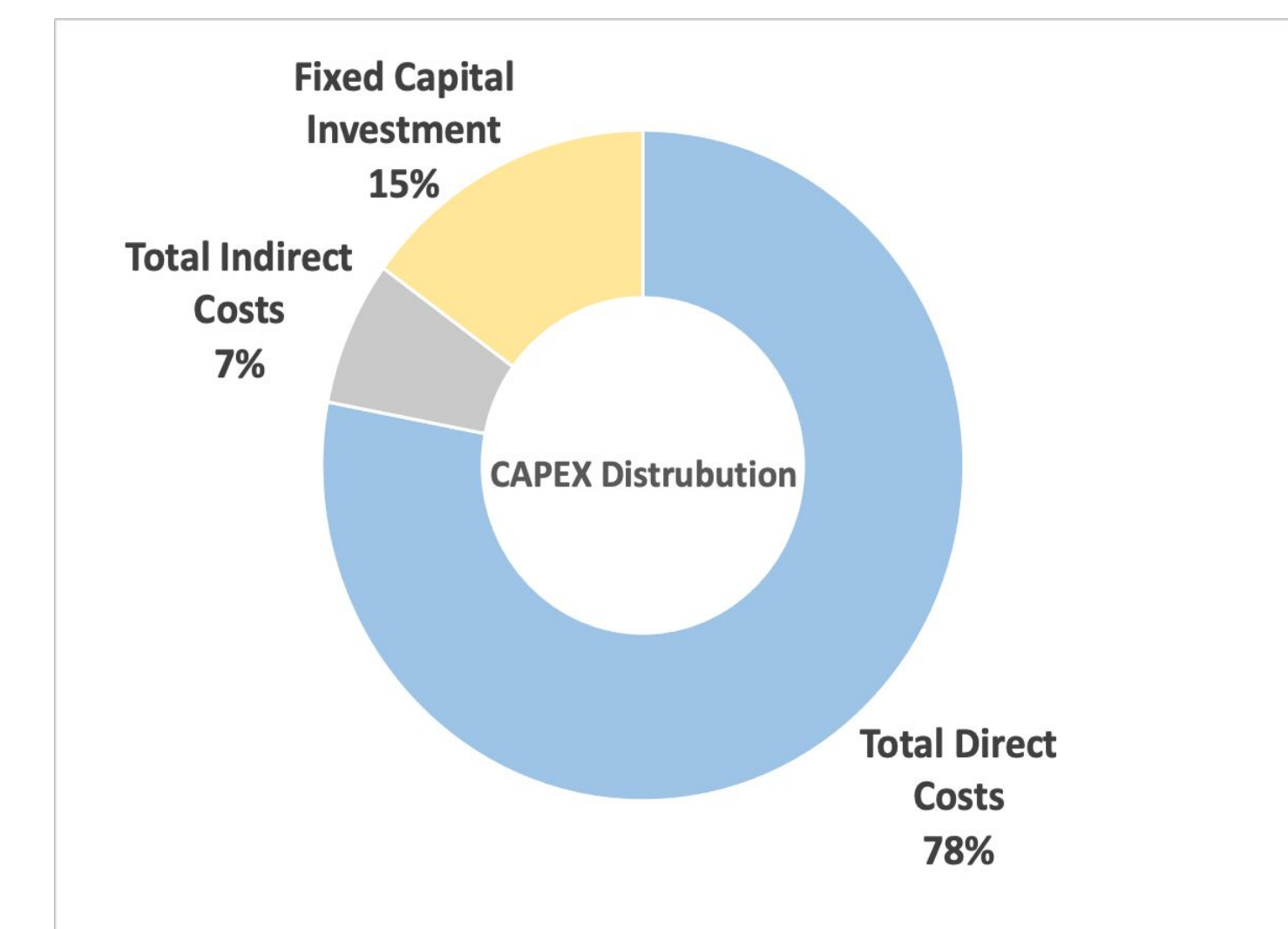
- Fixed capital cost (FCI) 85%
- Working capital (WC): 15%

Total Annual Operating Cost: \$677 Million CAD

- Raw material cost 52%
- Labour cost: 0.68%

Revenue:

- Average 30 day price of Gasoline: 215.64 USD/bbl
- Gross Annual Profit: CAD 16.4 million
- Annual Revenue: CAD 693 million



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