

Jet-Fuel Production From Vegetable Oil

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Aviation Sector Challenges

- Projected growth from **4.5 billion** to **7.2 billion** travelers (**60% growth**) by 2035^[1].
- Aviation sector is one of the **fastest-growing polluting industry** in the world^[2].

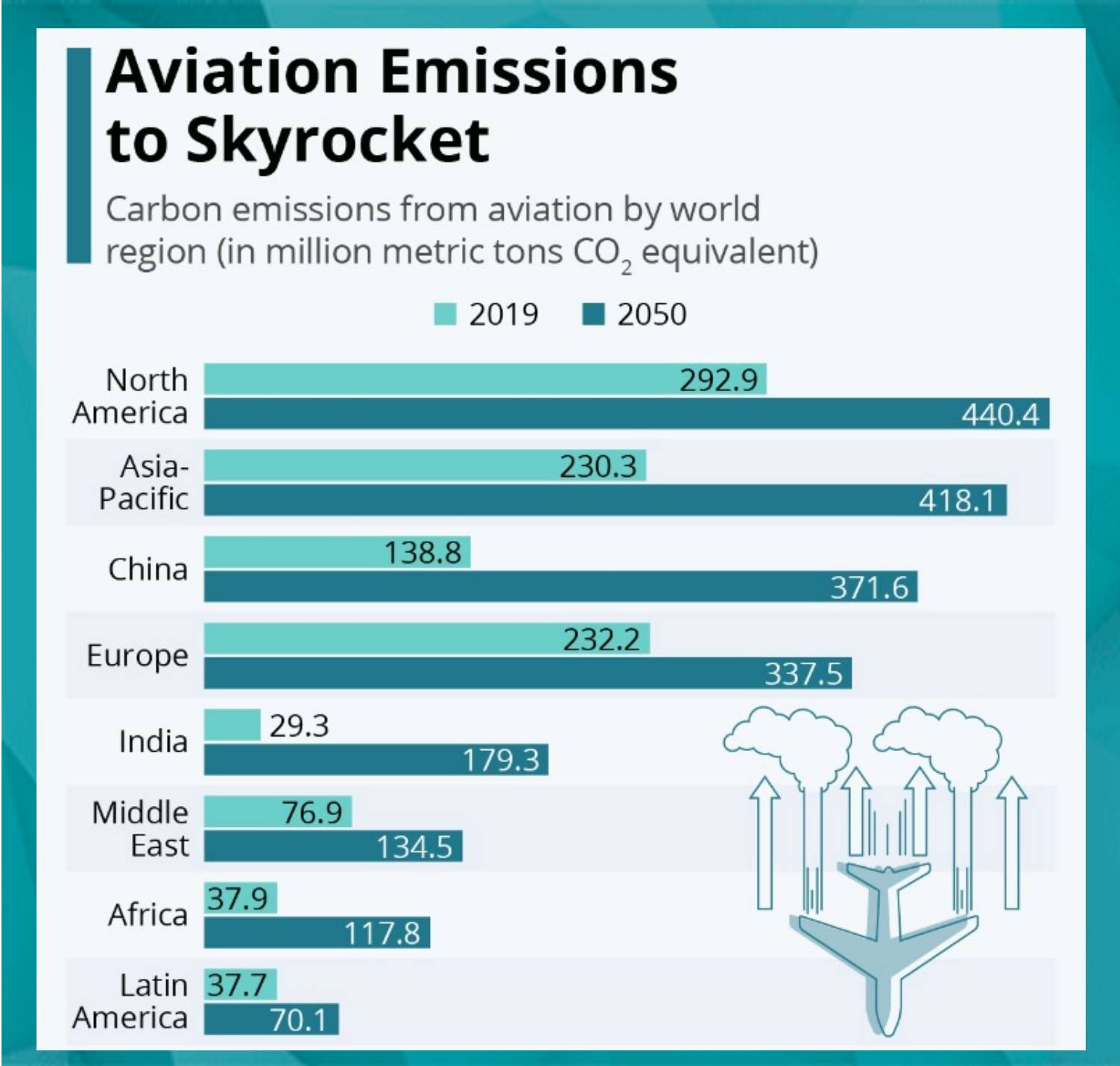


Figure 1: Carbon emissions from aviation by world region [3]

Our Solution

Leverage the **Hydrotreated Esters and Fatty Acids (HEFA)** process with **canola oil as a feedstock** to produce **sustainable aviation fuel (SAF)** and meet the demand of an ever-growing airline industry.

Market Opportunity for SAF

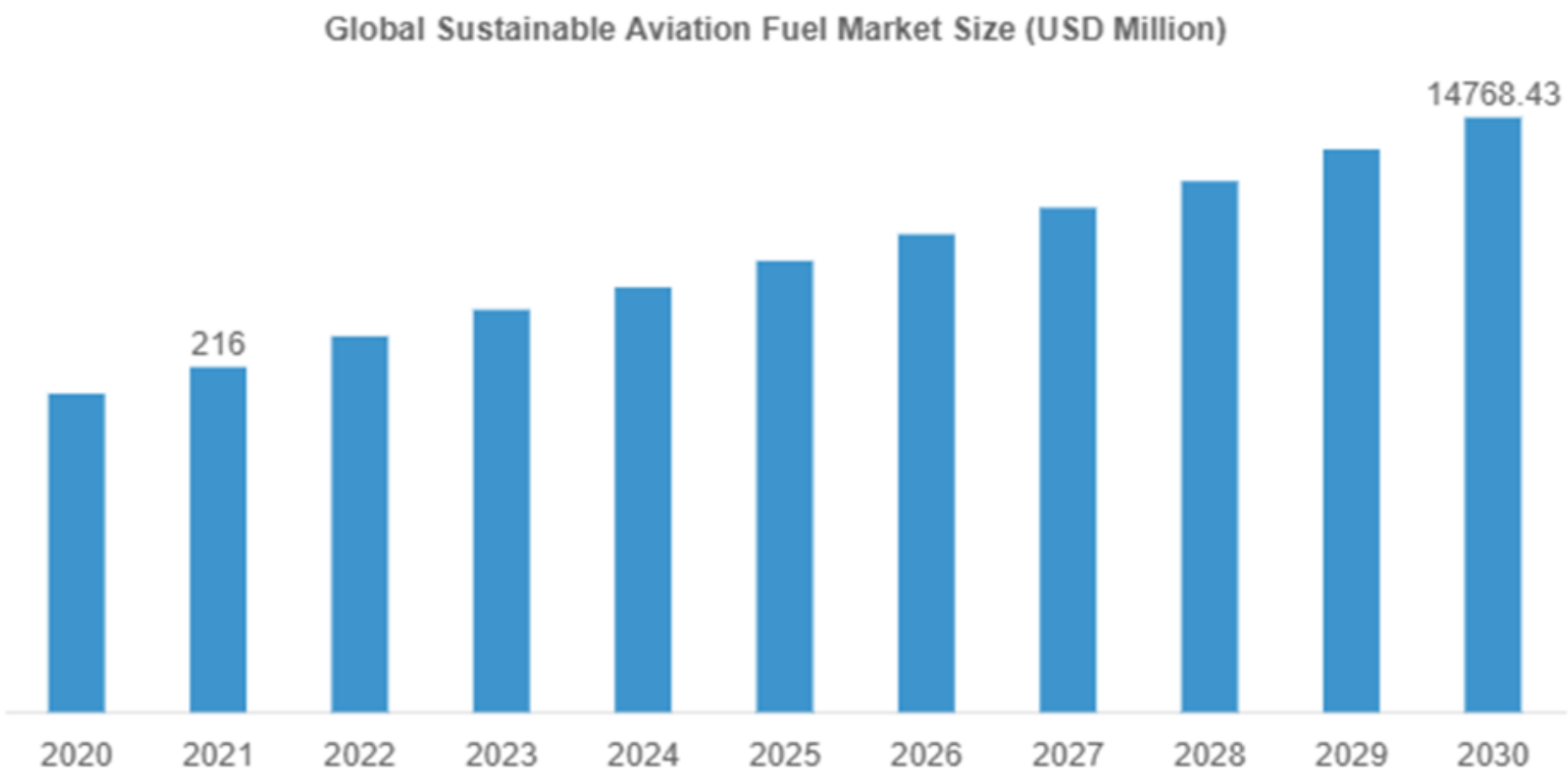


Figure 2: Global SAF market size and growth

SAF market projected to increase from \$216 million dollars in 2021 to more than **\$14 billion dollars by 2030** resulting in a **68.4% market growth**^[4].

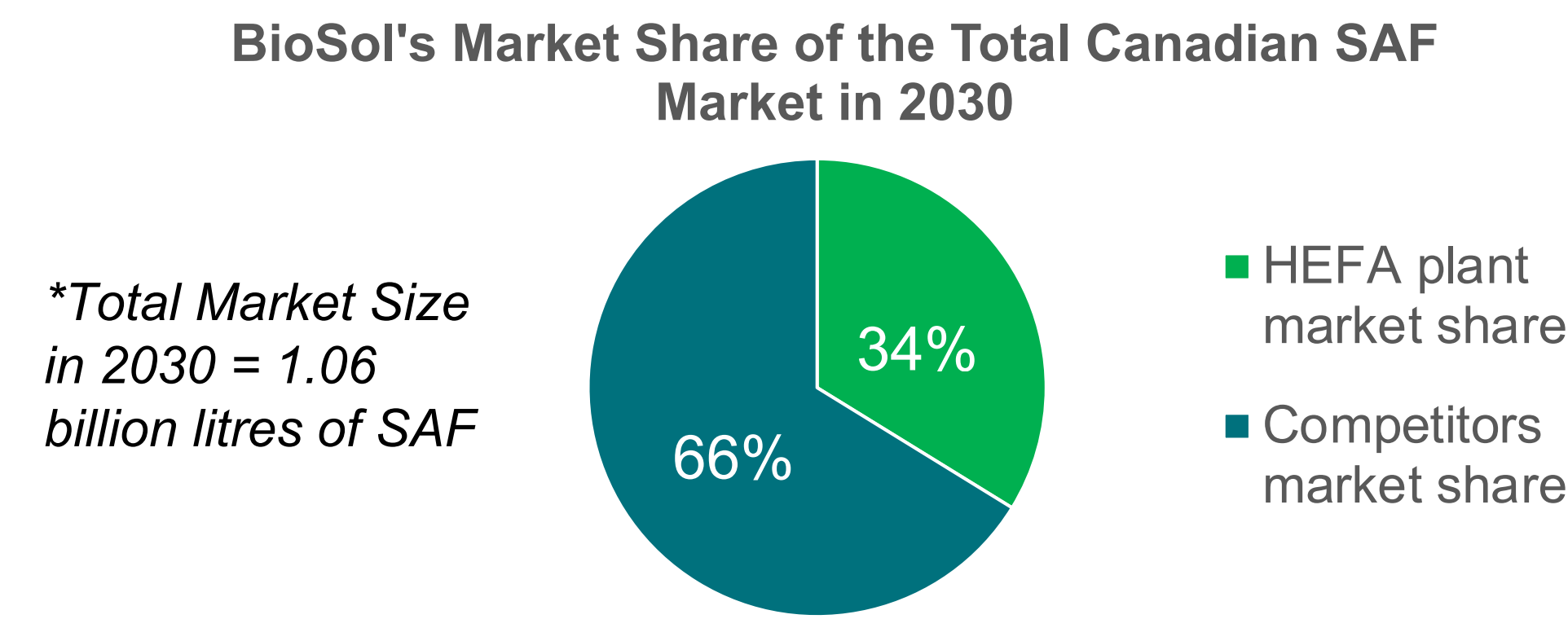
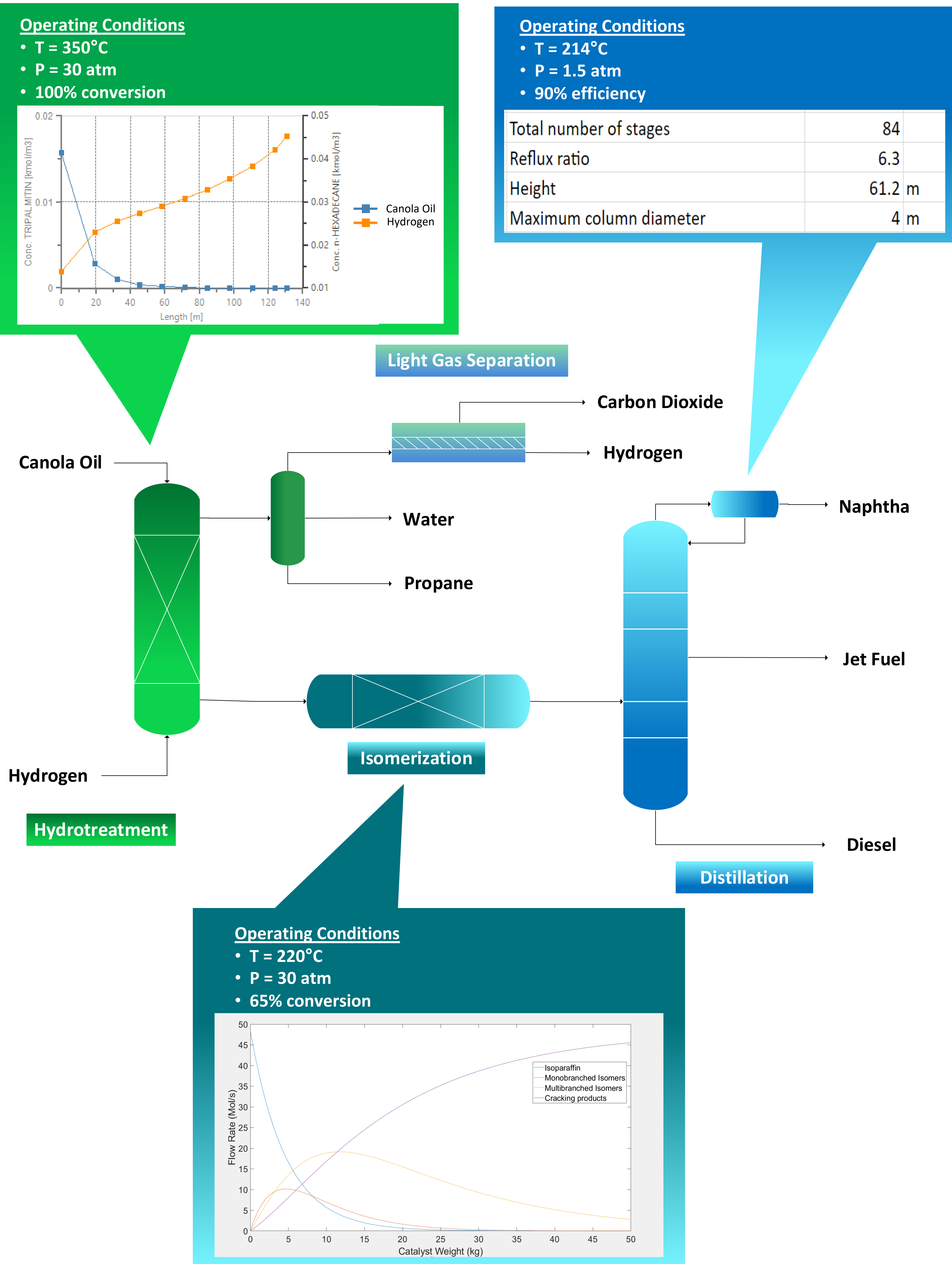


Figure 3: Proposed HEFA plant market share of the total Canadian SAF Market

Proposed SAF production amount of **268.64 million kilograms per year**.

Design & Performance



Will it be Profitable?

Economic Metric	Financial Metric
CAPEX	\$202.9M
OPEX	\$863.3M
Annual Revenue	\$1,078.2M
Net Present Value, NPV	\$10.4M
Lifetime Projected Cashflow	\$194.4M
Discounted rate of Return, DRR	16.2%
Return on Investment, ROI	10.9%
Discounted Payback Period	4.4 years

Figure 4: Economic indicators with values for the HEFA plant

Social and Environmental Impacts

- Wastewater and carbon dioxide to be sent to wastewater treatment.
- A **reduction of 14.4 gCO₂-eq/MJ** for SAF compared to conventional jet fuel.
- Minimal negative social impact** towards food industry.

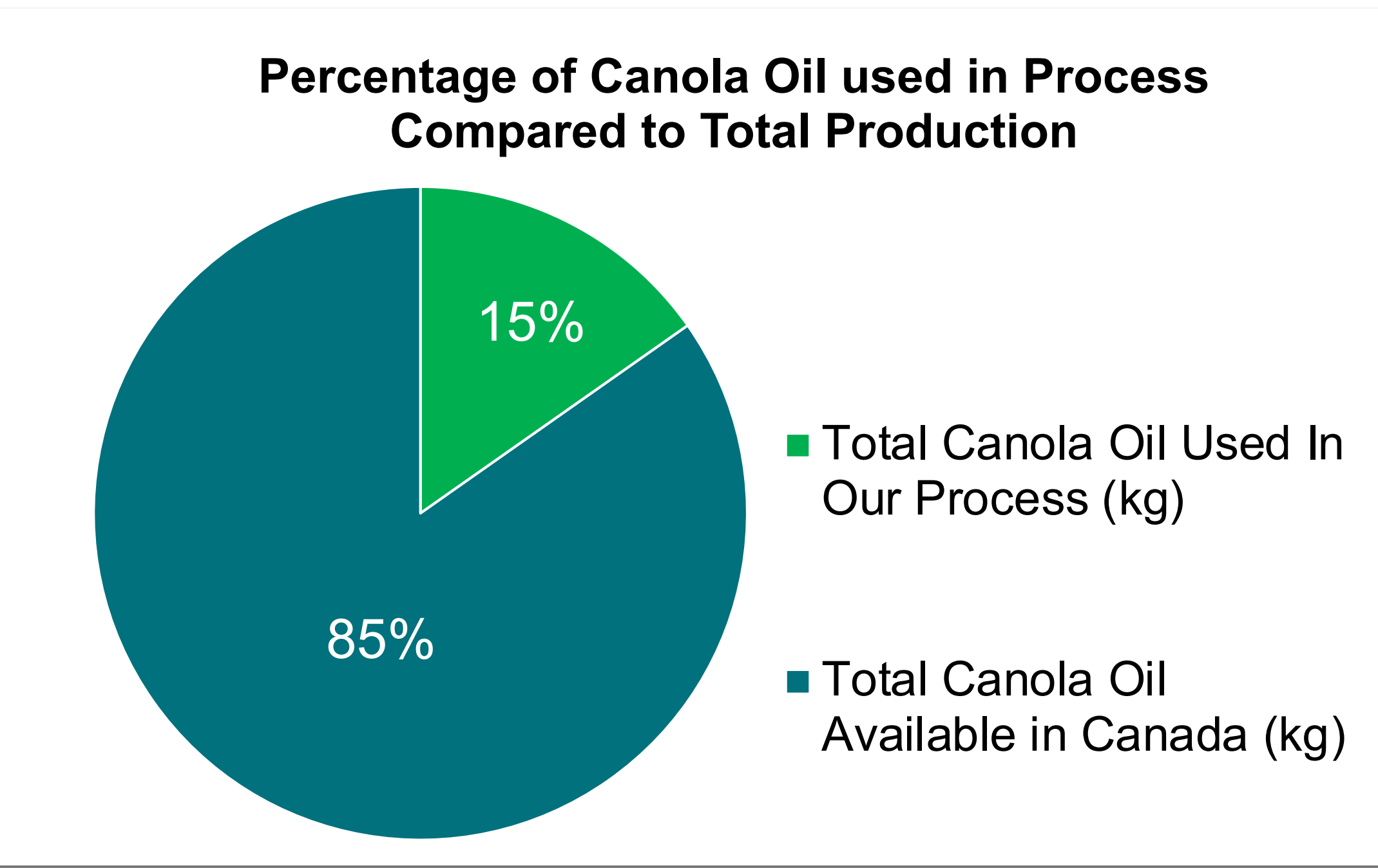


Figure 5: Comparison of canola oil used in the BioSol process and the total canola oil available in Canada (2022 data)^[5]

Conclusion

- Economically feasible with a reasonable payback period.
- Environmentally friendly in comparison to conventional jet fuel and socially sensible.
- Finalizing the P&IDs, plot plan, and plant layout.

References

[1] IATA. (2017, October 24). Passenger numbers to double by 2035. IATA. <https://airlines.iata.org/news/passenger-numbers-to-double-by-2035>

[2] Ritchie, H., & Roser, M. (2020). CO2 emissions from aviation. Our World in Data. <https://ourworldindata.org/co2-emissions-from-aviation#:~:text=Non%2DCO2%20climate%20impacts,number%20of%20more%20complex%20ways.>

[3] Statista Research Department. (2022). Aviation emissions by continent. Statista. Retrieved March 22, 2023, from <https://www.statista.com/chart/23321/aviation-emissions-by-continent/>

[4] The Brainy Insights. (2022, July). <https://www.thebrainyinsights.com/report/sustainable-aviation-fuel-market-12818#summary>

[5] Canola Council of Canada. (2022, February 11). Canola industry: At a glance. Canola Council. <https://www.canolacouncil.org/markets-stats/>