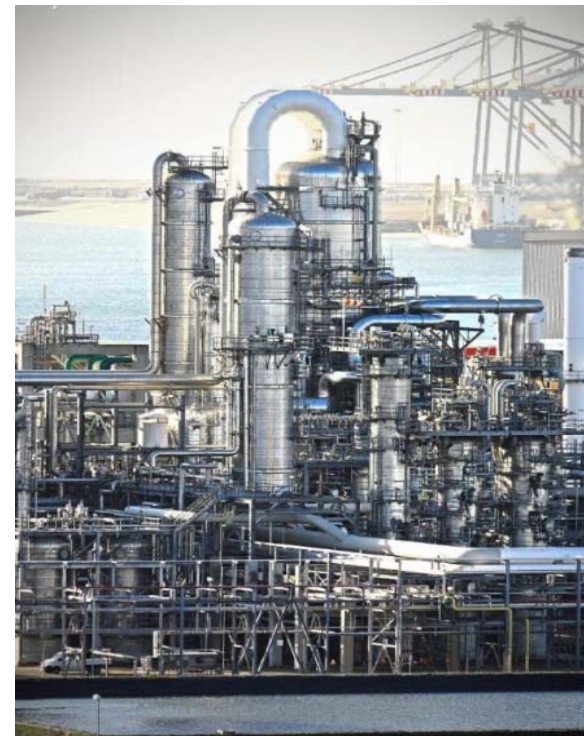


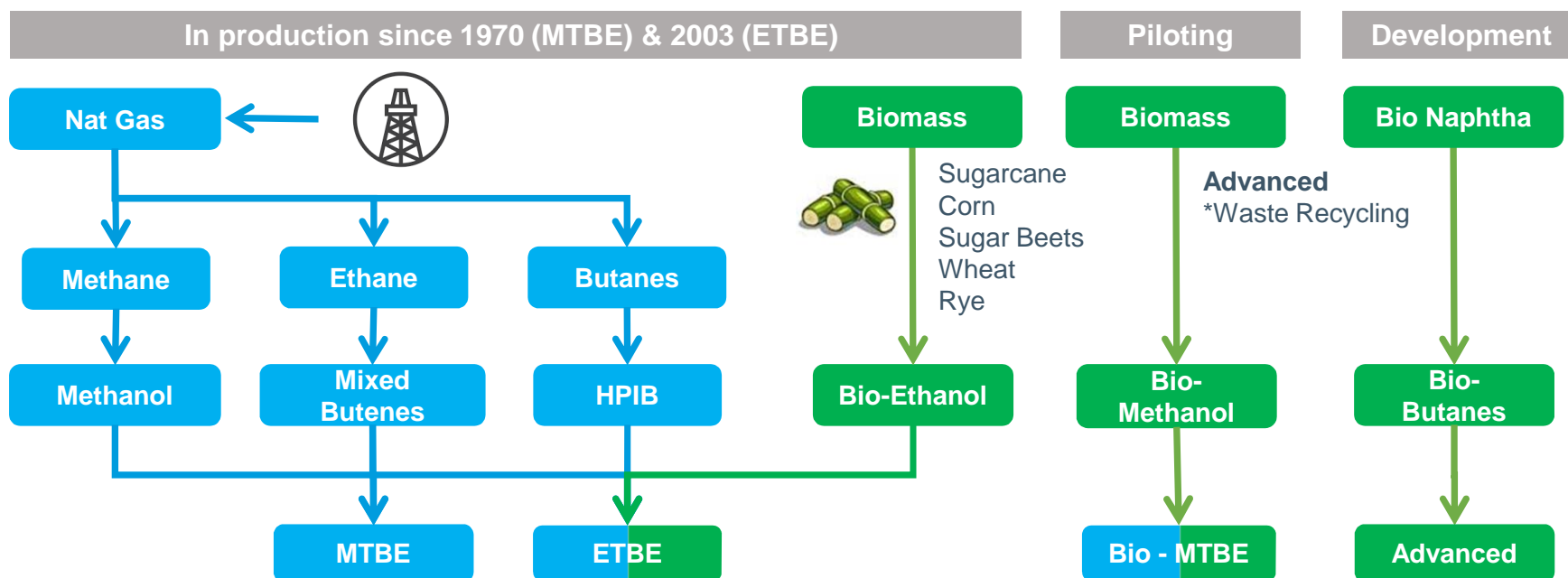
The role of sustainable oxyfuels as a high-octane petrol to improve air quality while addressing biofuels ambition

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Oxyfuels can be produced from hydrocarbons or renewable biomass



■ Production Facilities

- 3 x US Gulf Coast production sites – 1.8 million tons pa
- 2 x European production sites (France, The Netherlands) – 1.2 million tons pa
- 1 x US Gulf Coast site under construction, start-up planned 2021 - 1.4 million tons pa
- 56% (1.7 million tons) of 2019 production was Bio-based

■ LYB reduced GHG emission from feedstock by 69% vs. traditional fossil feedstocks

Oxyfuels can utilize can all forms of advanced Ethanol/ Methanol/Butanes

*Capacities based on 100% TBA conversion to MTBE, % Bio is based on ETBE volume produced in 2019,

India's success story by using (advanced) MTBE/ETBE

(Advanced) MTBE/ETBE will

- make full use of the available bio-ethanol and domestic feedstocks to reduce crude imports
- make it easier and cheaper for refiners to meet Bharat VI specifications and produce 95RON gasoline
- bring advanced fuels to the whole of India with reduced need for additional infrastructure investment
- be used in conjunction with ethanol to improve air quality and increase octane
- improve air quality and reduce emissions of ozone and particulate matter
- sets stage for higher octane consistent with EU trend to reduce emissions and improve fuel efficiency



What is required to enable this?

- Allow Oxyfuels up to 3.7 weight % oxygen limit
- Allow Oxygenates in import gasoline

Oxyfuels are the best solution for improved air quality and energy independence