Maximizing SAF and renewable diesel yields with ExxonMobil Process Technology

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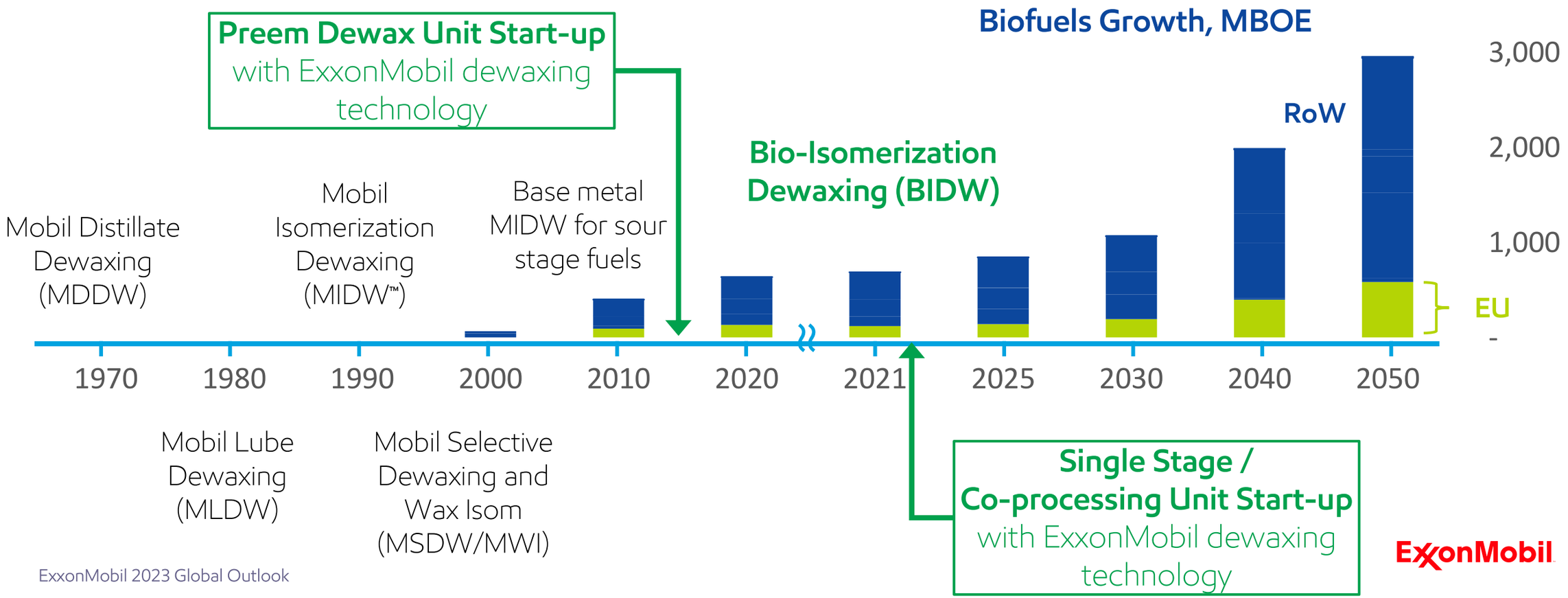
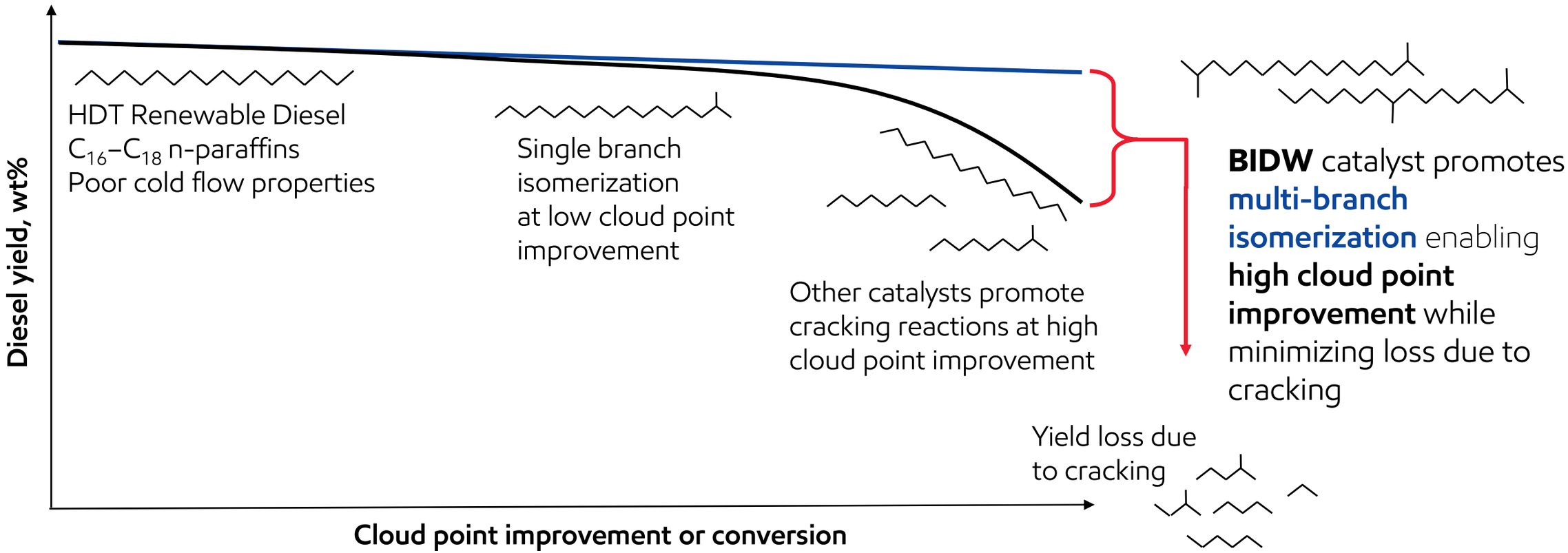
ExxonMobil: Technology leader and operating excellence

BIDW™ catalysts leverage ExxonMobil's proven track record of deploying dewaxing technologies and integrating into ExxonMobil and third party facilities



BIDW™ isomerization catalysts maintain long-chain products



Conventional fuels cold flow improvement

Lubricants cold flow improvement

Renewable fuels cold flow improvement

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BIDW™ catalyst

- Maximize yields & feed flexibility
- Meet stringent product quality requirements
- Long, robust catalyst life

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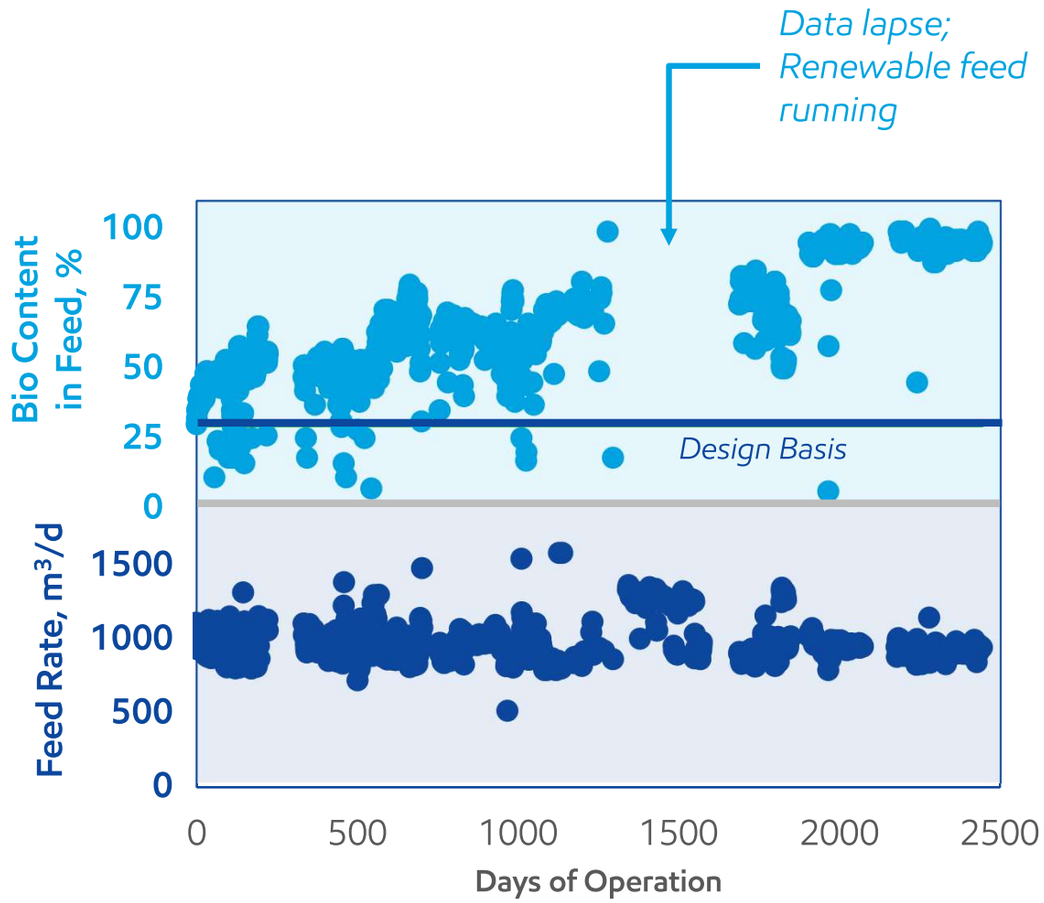
BIDW™ catalysts enable stable, robust operation with feed flexibility

- Stable operation despite varying feed composition and desired product cold-flow property specifications
- Feed co-processing renewable content varies from ~30% (Design Basis) up to 100%
- No need to reduce unit feed rate to accommodate increased renewable content
- Stable performance through upsets



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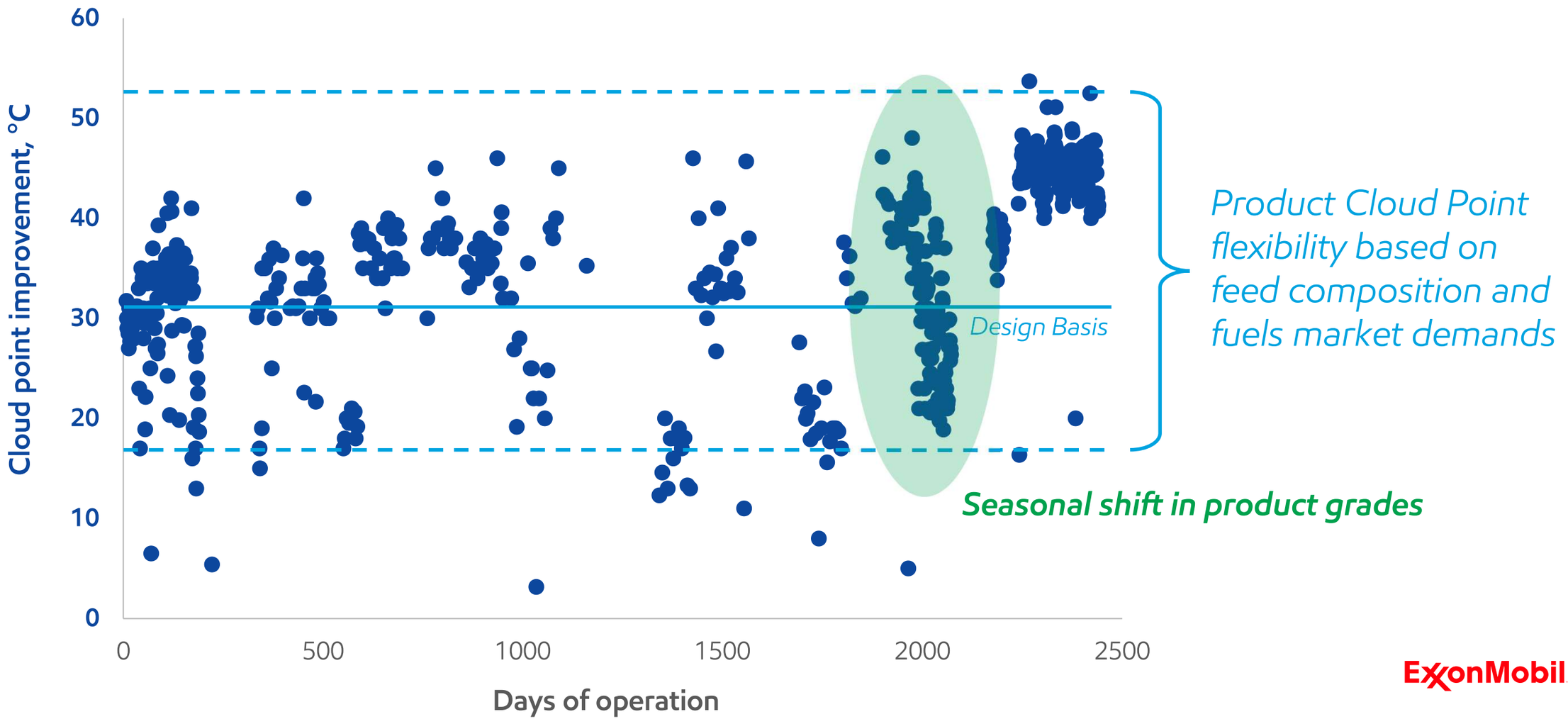
BIDW™ catalysts offer high delta cloud operation & seasonal flexibility



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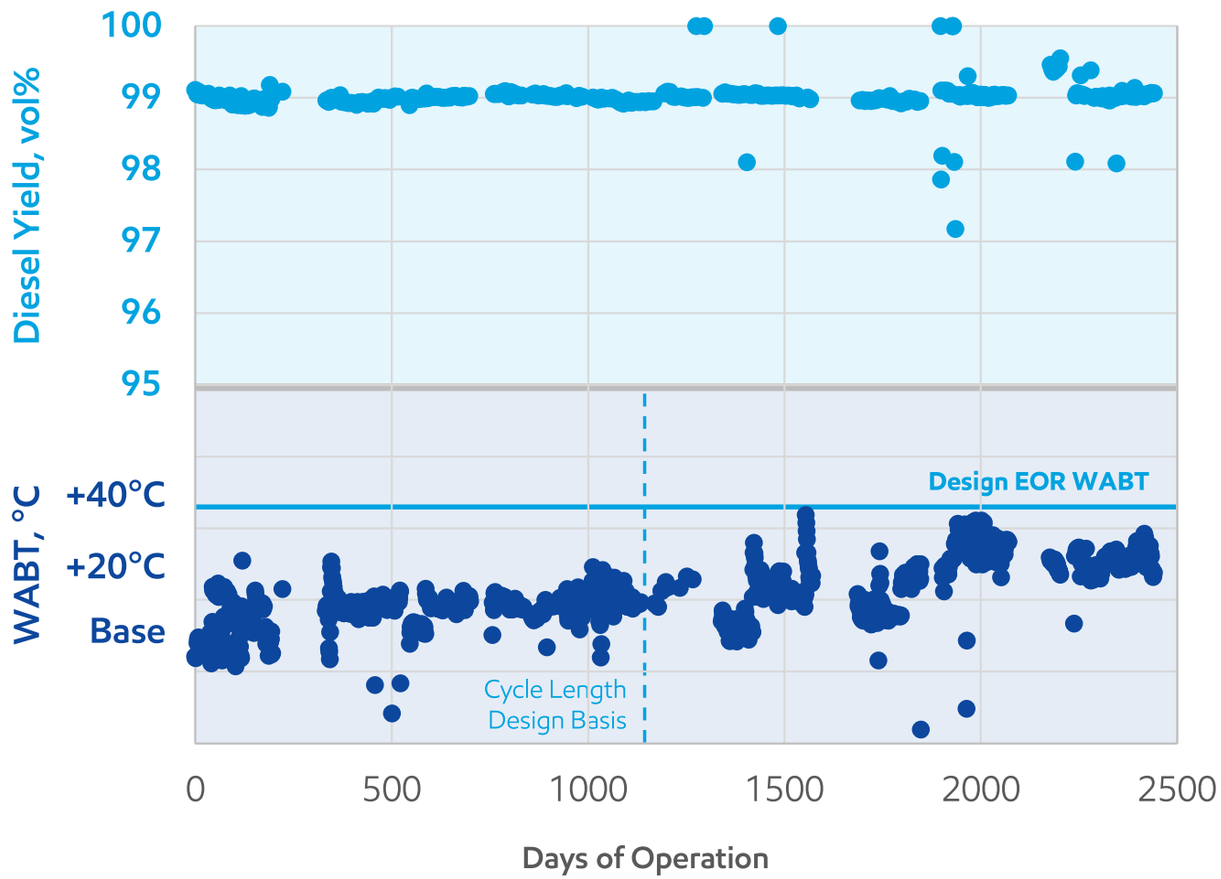
BIDW™ catalysts maximize yields & provide operational stability

- Diesel yield remains near 100% during entire operation
- Weighted-Average Bed Temperature (WABT) remains stable despite site upsets
- Feed N spikes up to 2-4 ppm for extended periods of time
- Multiple power outages
- Cycle length set not by dewaxing, but by aromatics
- **Customer selected BIDW-3 catalyst for reload; successful 4Q 2023 start-up**



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EMRD™ & EMRJ™ advanced process technologies

- Enabled by high performance BIDW™ catalyst
- Decades of deep dewaxing & licensing experience
- Operator know-how

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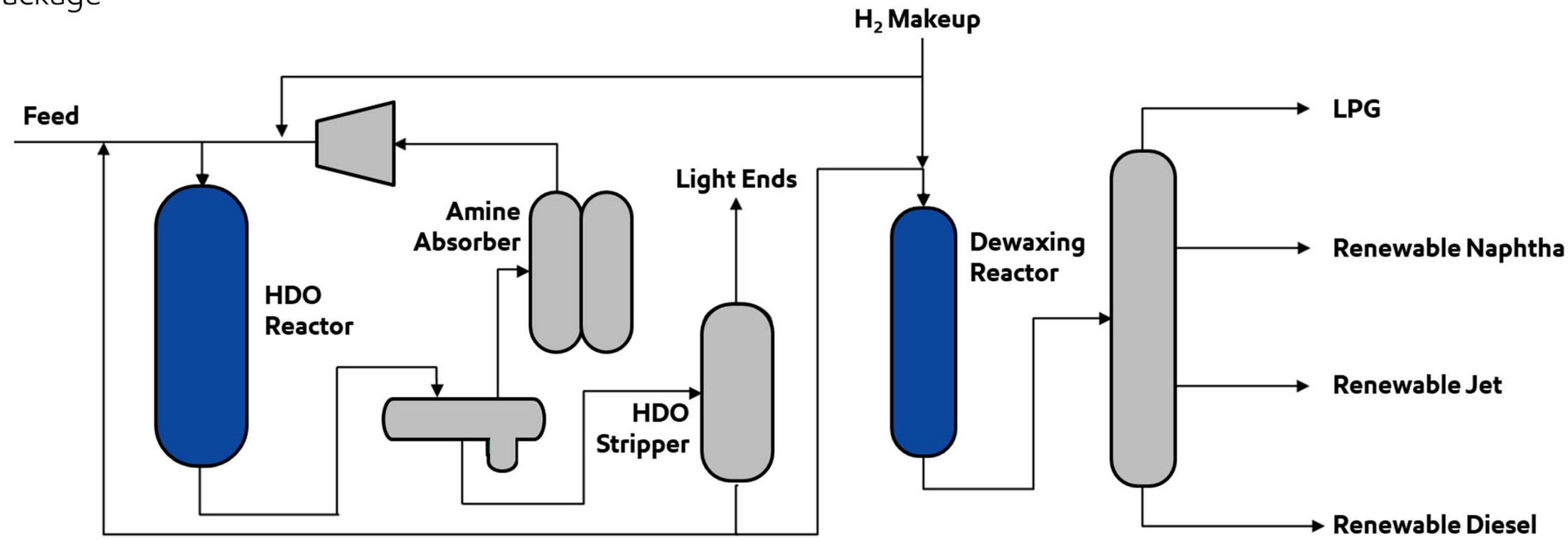
ExxonMobil Renewable Diesel (EMRD™) & Renewable Jet (EMRJ™) processes with BIDW™ catalyst

ExxonMobil is an **industry leader** in design and operation of hydroprocessing units and **advantaged dewaxing technology**, and is utilizing this expertise to provide an integrated SAF and renewable fuels technology package



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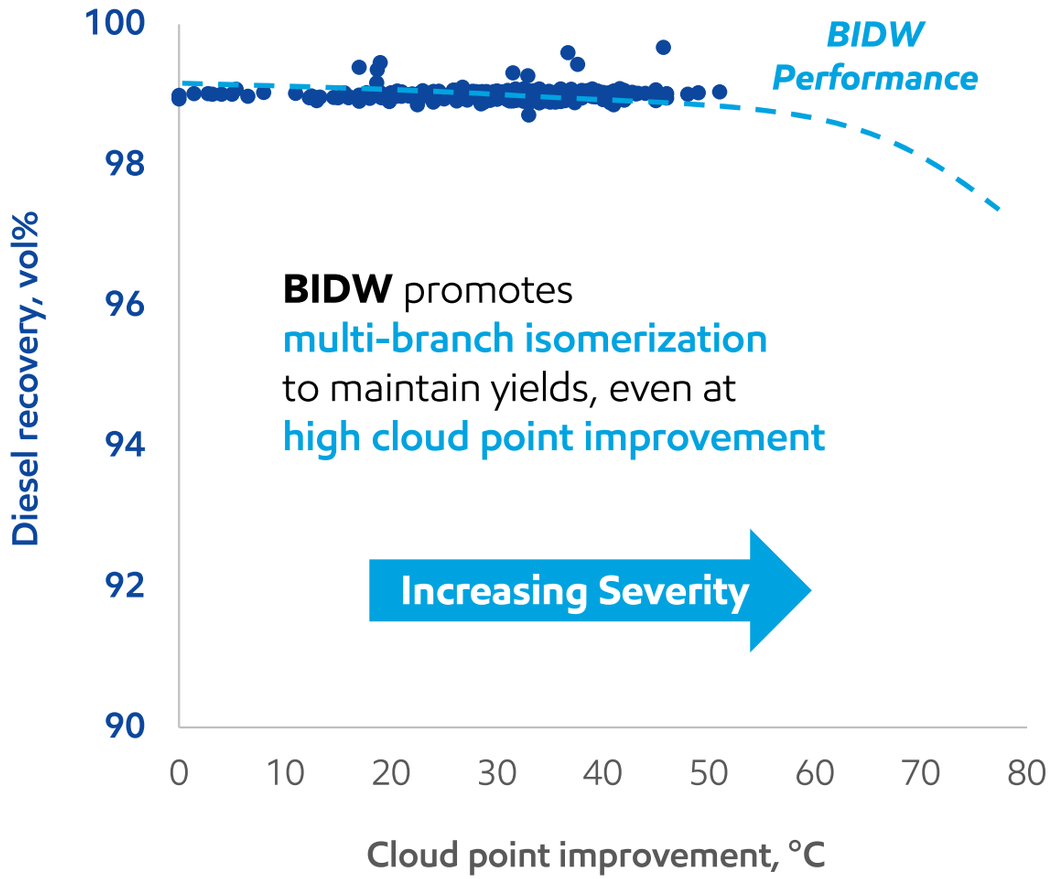
EMRD™ process with BIDW™ catalyst: High diesel yields at high dewaxing severity



Example: EMRD with BIDW vs. Alternatives**

		Base 30°C dCP		Arctic Diesel	
	Units	NBA	BIDW	NBA	BIDW
Cloud Point Improvement (dCP)	°C	30	**30**	60	**60**
Hydrotreated Veg Oil Cloud Point	°C	25	**25**	25	**25**
Renewable Diesel Cloud Point	°C	-5	**-5**	-35	**-35**
Yield Advantage	wt%		**+1.0 to +2.0**		**+6.0 to + 8.0**
Incremental Diesel on **1600 m^3/d** Bio Feed Rate	bpd		**+100 to +200**		**+600 to +800**
Incremental Margin Estimates	M$/yr		**+11 to +21**		**+63 to +84**

Notes: Cutpoint between naphtha and diesel assumed at 135°C, actual operations will set absolute diesel yields. Margin credit assumes ~1800 $/m^3 value on renewable diesel.
*Source: IHS Markit, long term forecast, RD HVO US West Coast- naphtha value
**Source: ExxonMobil data

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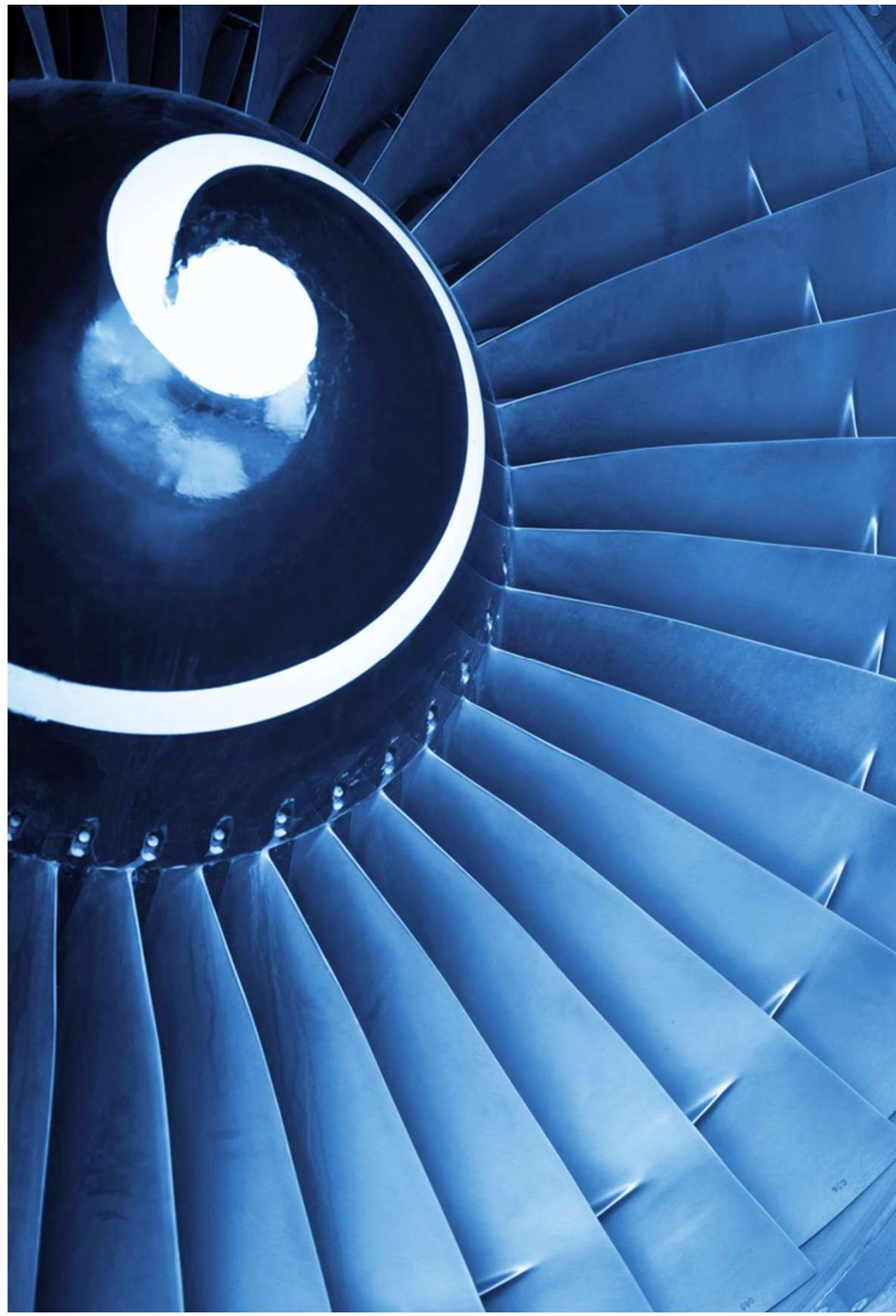
EMRJ™ process: High SAF yields at very high dewaxing severity

- ExxonMobil is a recognized leader in isomerization catalysis
- 40+ year history of deep isomerization design and operation
- Developed with an eye **from feed sourcing through SAF blending**
  - Designed from an operator's perspective
  - High liquid yields throughout cycle
  - Robust performance and tolerance to upsets
  - Product quality



Conclusions

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ExxonMobil: Differentiated solutions to maximize profitability

- ExxonMobil is an industry leader in the design and operation of hydroprocessing units and advantaged dewaxing technology
- EMRD™ and EMRJ™ processes leverage BIDW™ catalysts and enable **front and back-end flexibility with advantaged activity and yield profiles**
- BIDW catalyst platform offers **proven, commercially available, drop-in solutions** that
  - Enable feed flexibility
  - Maximize yields
  - Meet stringent product quality requirements
  - Offer long, robust operation over long cycle lengths
  - Fit existing dedicated and co-processing units

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BIDW™ Portfolio: Solutions to maximize product yields & quality

Hydro-Dewaxing Catalyst	BIDW-1	BIDW-3	BIDW-2
Applications	Refills / Grassroots		Refills
Processing Objective	**Diesel**	**Max Jet**	**Co-processing**
Typical Renewable Feed, %	100%	100%	Up to 100%
Feeds	Vegetable Oils (HVO), Animal Fats, UCO, Others		
Yields			
Diesel	**High**	**High**	**Medium**
Jet / SAF	**Medium**	**Highest**	**Medium**
Contaminant Tolerance	Medium	Medium	High
Upset Tolerance	High		
H_2 Consumption	Low/Minimize	Low/Minimize	Medium
Cycle Length	High	Highest	Medium*
Potential Cloud Improvement, °C**	**90**	**120**	**40-50**

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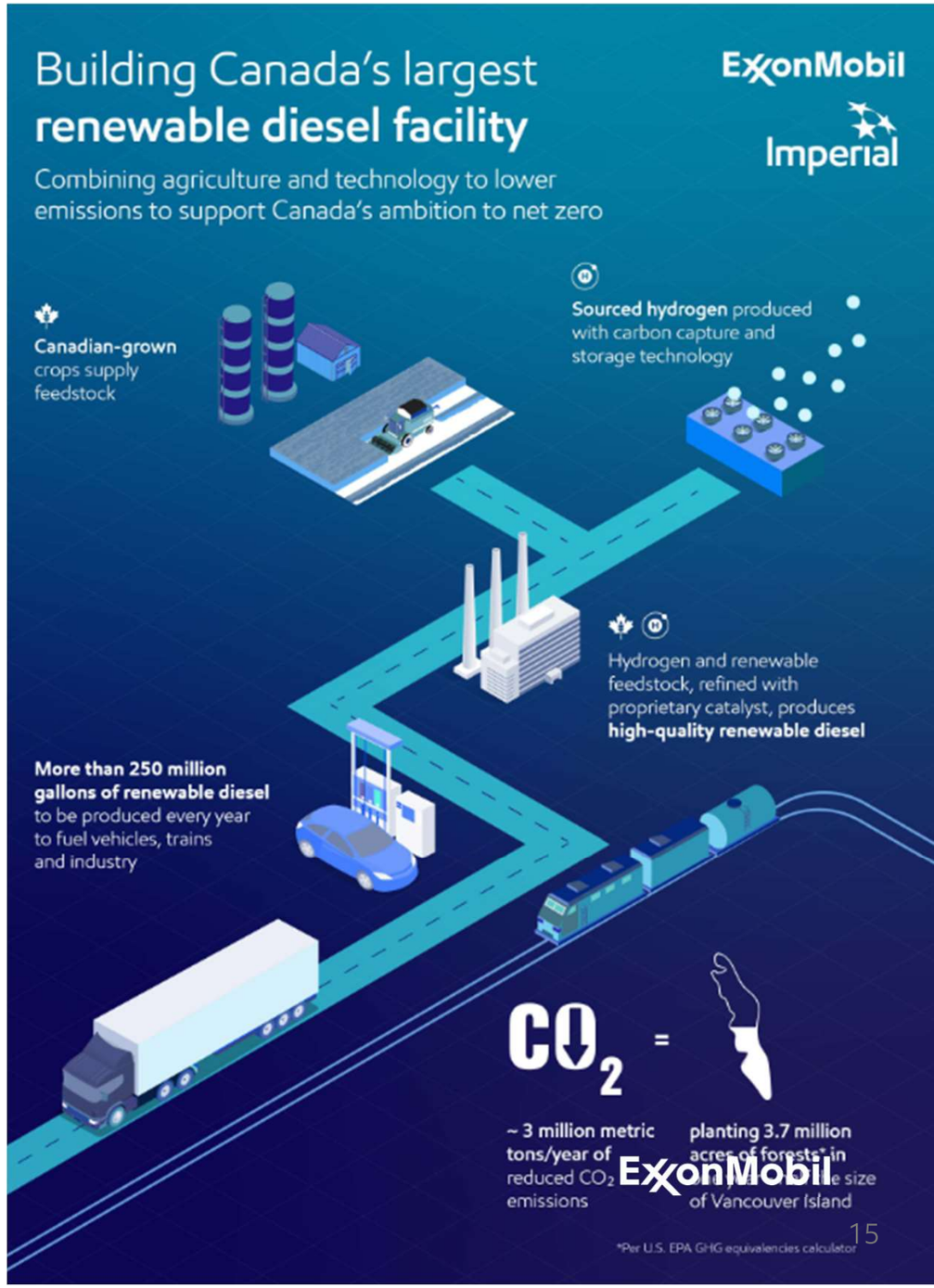
*Often limited by HDO catalyst cycle length
**Dependent on feed, process conditions, and desired cycle length

ExxonMobil BIDW™ catalyst for Renewable Diesel at Strathcona Refinery

- 20 kbd renewable diesel facility currently under construction at ExxonMobil/Imperial refinery
- $500M+ USD investment; planned 2025 start-up
- Utilizing BIDW catalyst for dewaxing of paraffinic species to produce Renewable Diesel product

*ExxonMobil Announcement, August 2021



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Thank you!