

Sustainable Aviation Fuel (SAF) Industry dynamics & development

Merel Laroy
Head of Marketing & Communication
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SkyNRG

FUTURE FRIENDLY FLYING

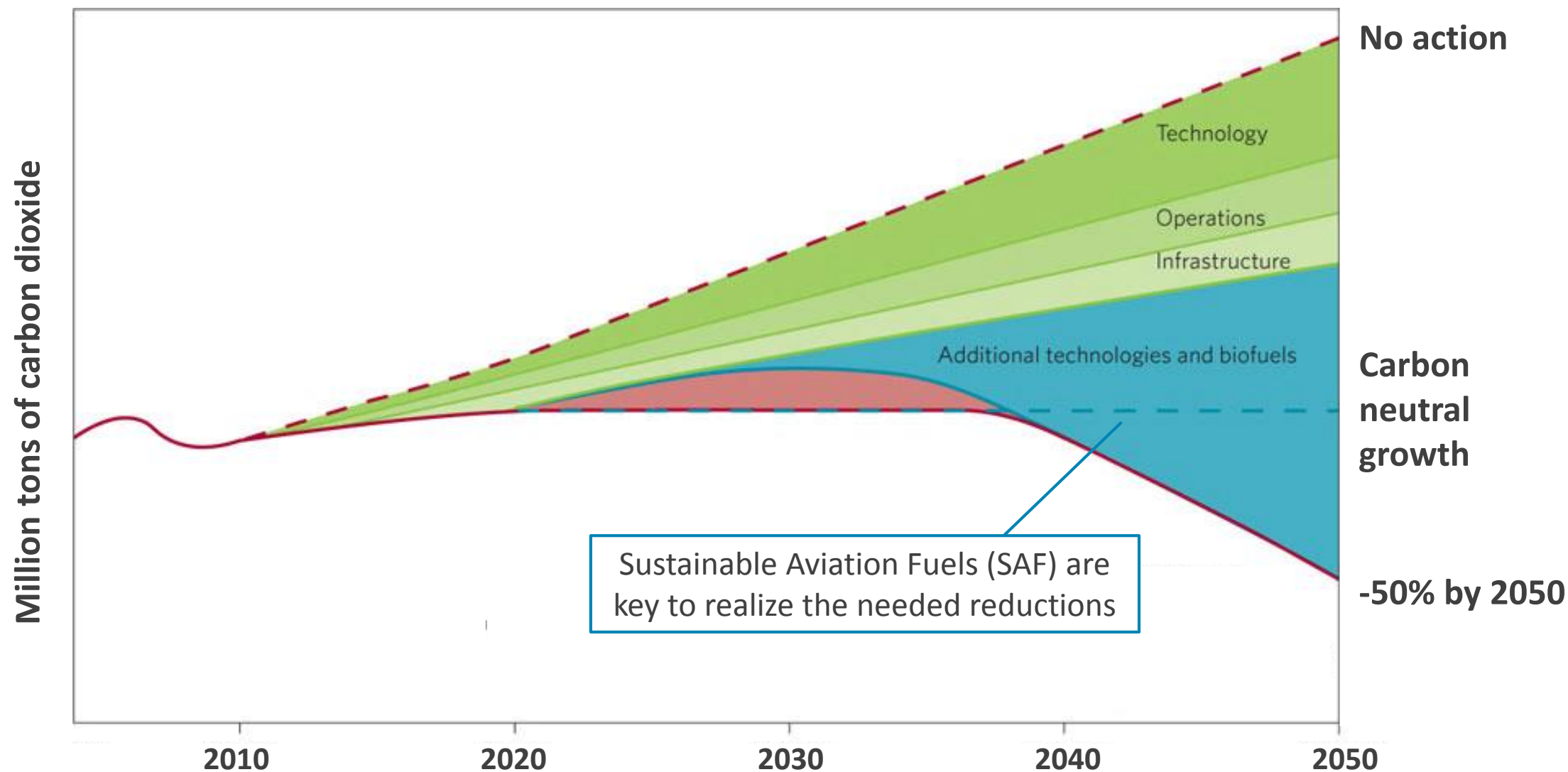
Agenda

Rationale for Sustainable Aviation Fuel

- ▶ Introduction to SkyNRG
- ▶ Technology overview
- ▶ Production capacity
- ▶ Government incentives

Aviation does not have many options to reduce its footprint

CO₂ reduction options for aviation 2005-2050



Agenda

- ▶ Rationale for Sustainable Aviation Fuel

Introduction to SkyNRG

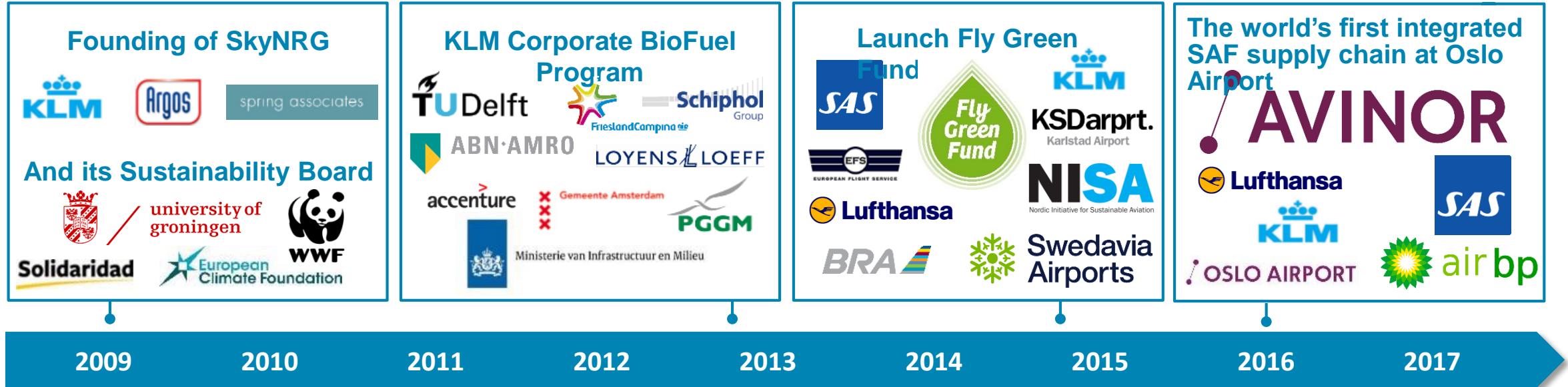
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SkyNRG is global market leader for Sustainable Aviation Fuel

Highlights in SkyNRG's track record



SkyNRG supplied most commercial sustainable aviation fuel flights up to date

Logos include: porter, Alaska Airlines, TAM, Air Canada, ETIHAD AIRWAYS, THAI, NEXTJET, british midland bmi, LAN, Thomson Airways, QANTAS, Jetstar, FINNAIR, AEROMEXICO, AIRBUS, ANA, BOEING, AIRFRANCE, KLM, SOUTH AFRICAN AIRWAYS.



Geneva Airport

- Working towards implementation of an airport wide SAF blend of 1% starting in 2018

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Currently there are 5 conversion pathways certified, and more pending

NOT EXHAUSTIVE

Technology	Code	Feedstock	Max blend	Status	Technology providers
Fischer-Tropsch	FT	Biomass, MSW	50%	2009 ✓	Fulcrum BIOENERGY, VELOCYS
Hydroprocessed Ester and Fatty Acids	HEFA	Oils and fats	50%	2011 ✓	Uop A Honeywell Company, Axens IFF Group Technologies, Syntroleum®, HALDOR TOPSØE, NESTE
Synthesized iso-paraffins	SIP	Sugars	10%	2014 ✓	AMYRIS
FT Synthesized Paraffinic Kerosene plus Aromatics (also known as SAK)	SPK/A	Biomass, MSW	50%	2015 ✓	SASOL
Isobutanol to Jet	ATJ-SPK	Sugars, biomass, MSW	30%	2016 ✓	gevo
Ethanol to Jet		Sugars, biomass, MSW, CO	?	Possibly 2018	Swedish BioFuels, Vertimass Transformative fungible biofuels
Co-processing vegetable oil		Oils and fats	?	Possibly 2018	REPSOL, Chevron
Hydrotreated Renewable Diesel	HFP-HEFA	Oils and fats	?	2018/2019?	Uop A Honeywell Company, Axens IFF Group Technologies, Syntroleum®, HALDOR TOPSØE, NESTE



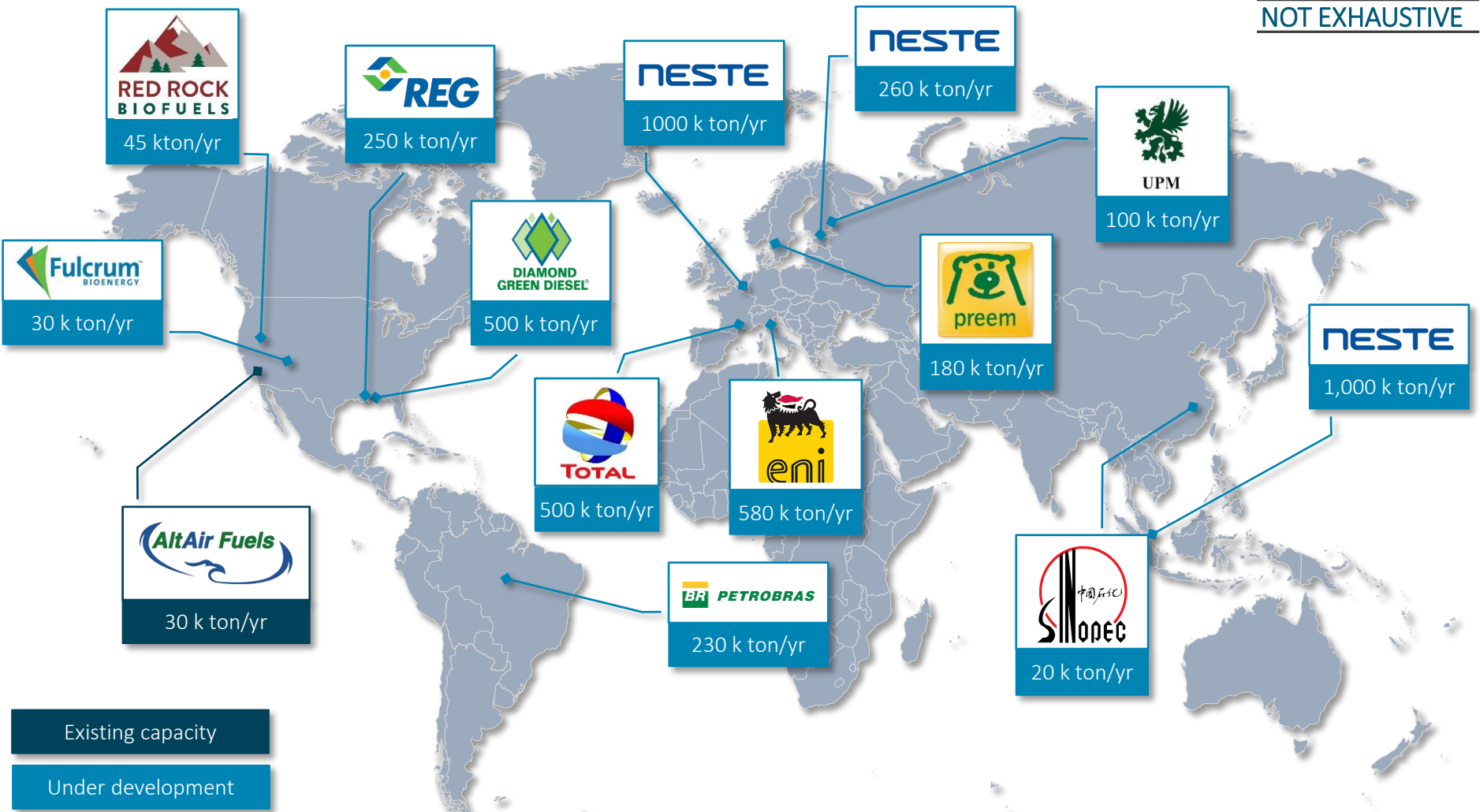
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There is only one SAF refinery in the world; it produces roughly 30 k ton of SAF per year since 2016



But many more facilities are under development or awaiting fuel certification



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Government incentives

Up till now no incentives for SAF were in place. But change is coming.

Sweden: fossil free aviation from 2030 (domestic)

Norway: SAF Mandate pending approval:
1% in 2019
30% in 2030

United States
RFS2 allows for SAF to generate RIN credits

European Union
RED I: voluntary inclusion for SAF
RED II: preferential treatment SAF

Contact

Merel Laroy

Head of Marketing & Communication

merel@skynrg.com

SkyNRG

Rapenburgerstraat 109

1011 VL Amsterdam

+31 20 470 70 20

info@skynrg.com

www.skynrg.com

