

State of the SAF Market



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We have three decades to scale up SAF production by hundreds of times, and all aviation stakeholders play key role for the transition

2023 SAF production

Million tonnes

2050 net zero SAF requirement

Million tonnes

0.5



x800

~400

Agenda

1

Current SAF landscape

2

SAF implementation barriers

3

Getting SAF facilities built

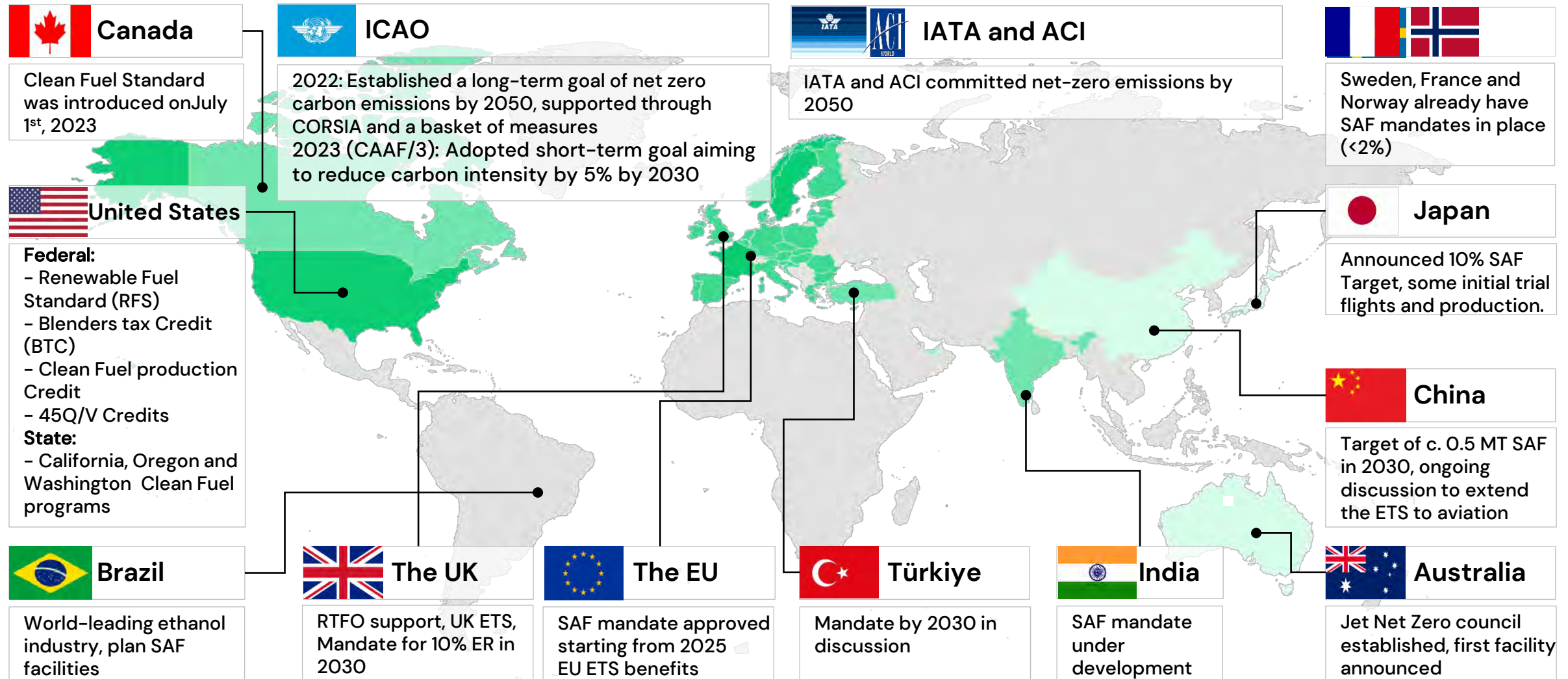
4

Questions

SAF is the a key tool for decarbonizing long-haul and most medium haul flights – which in total account for over 70% of aviation emissions

	2020	2025	2030	2035	2040	2045	2050	
Commuter » 9–50 seats » <60 minute flights » <1% of industry CO ₂	SAF	Electric or hydrogen fuel cell and/or SAF	Electric or hydrogen fuel cell and/or SAF	Electric or hydrogen fuel cell and/or SAF	Electric or hydrogen fuel cell and/or SAF	Electric or hydrogen fuel cell and/or SAF	Electric or hydrogen fuel cell and/or SAF	~27% of CO ₂ emissions
Regional » 50–100 seats » 30–90 minute flights » ~3% of industry CO ₂	SAF	SAF	Electric or hydrogen fuel cell and/or SAF	Electric or hydrogen fuel cell and/or SAF	Electric or hydrogen fuel cell and/or SAF	Electric or hydrogen fuel cell and/or SAF	Electric or hydrogen fuel cell and/or SAF	
Short-haul » 100–150 seats » 45–120 minute flights » ~24% of industry CO ₂	SAF	SAF	SAF	SAF potentially some hydrogen	Hydrogen and/or SAF	Hydrogen and/or SAF	Hydrogen and/or SAF	
Medium-haul » 100–250 seats » 60–150 minute flights » ~43% of industry CO ₂	SAF	SAF	SAF	SAF	SAF	SAF	SAF potentially some hydrogen	~73% of CO ₂
Long-haul » 250+ seats » 150 minute + flights » ~30% of industry CO ₂	SAF	SAF	SAF	SAF	SAF	SAF	SAF	

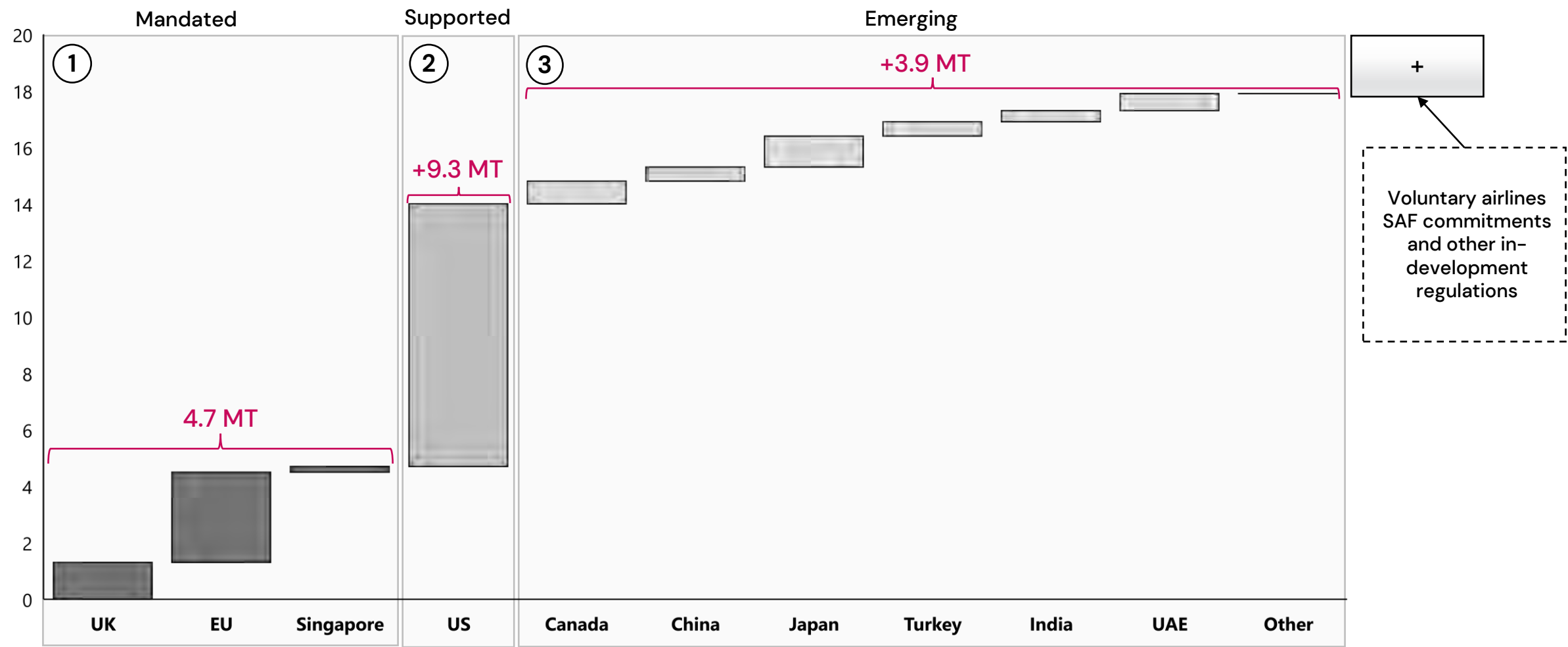
Momentum in SAF policies is building up with regulations and policies' development and implementation worldwide



Policy and national demand translate into ~ 16–18 MT of SAF by 2030

Policy driven SAF demand

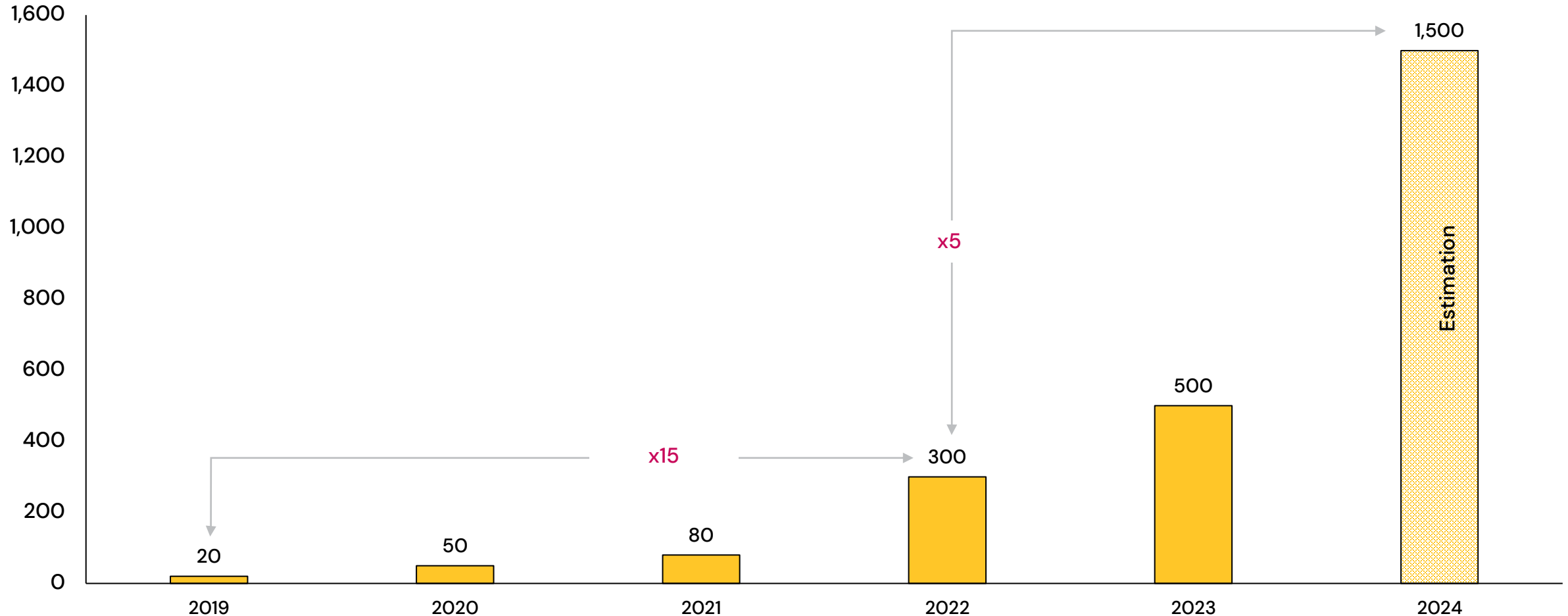
Million Tonnes SAF



SAF production has been rapidly scaling up over the last few years, but still remains only a fraction of the global jet fuel consumption

SAF supply across the world

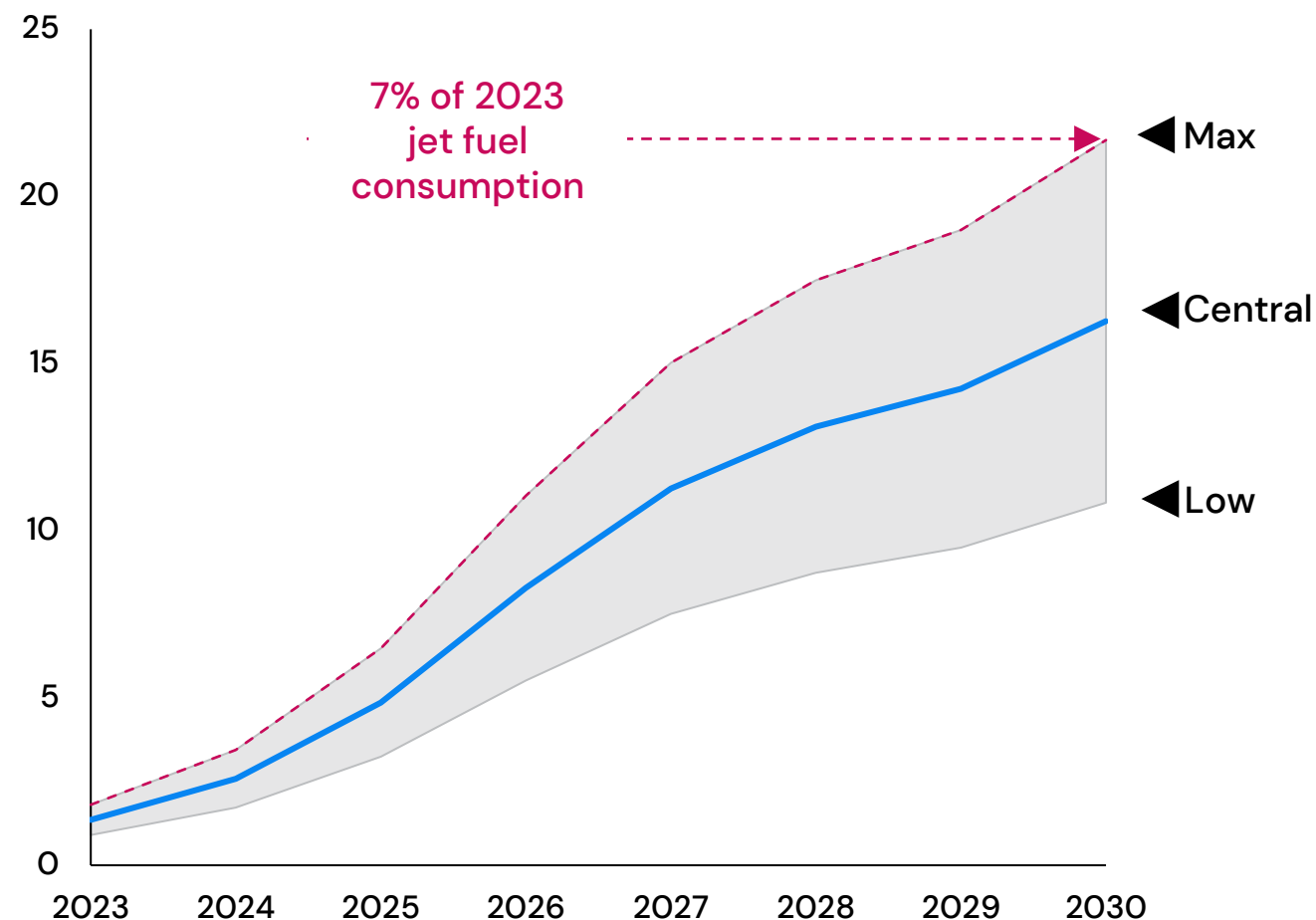
Kilotonnes SAF



Announced SAF capacity by 2030 could match global policy driven demand – yet substantial scale up is needed

Announced supply across the world

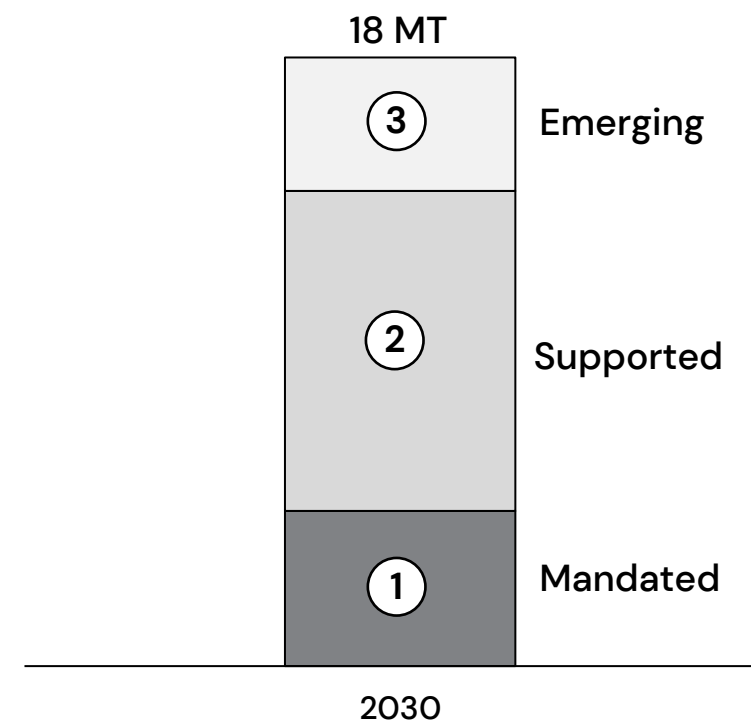
Million tonnes SAF, 2030



*Supply from announced facilities

Announced policy-driven SAF demand

Million tonnes SAF, 2030

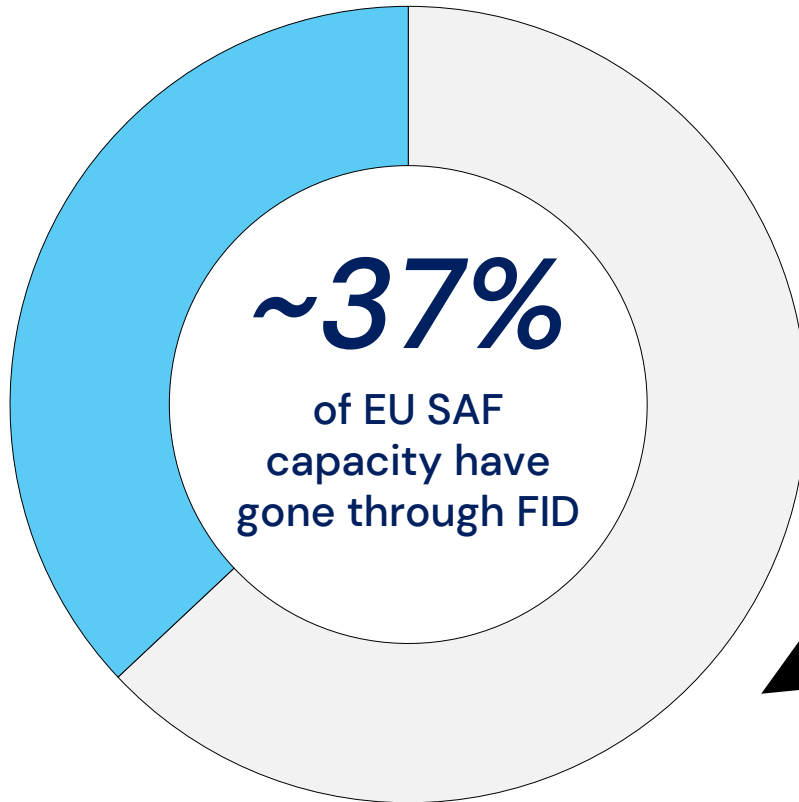


Source: ICF analysis of public announcements and discussions with producers

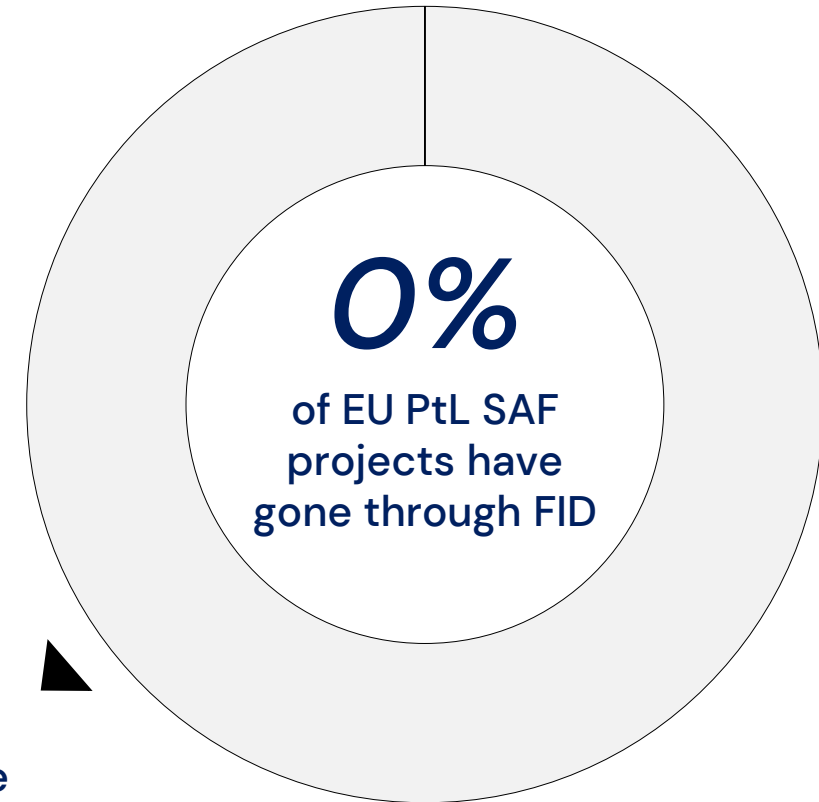
Note: The tracked figures represent the announced production capacity based on public announcements the actual SAF production can be lower due to operational or commercial disruptions

150+ SAF facilities are under development today, but ~6,000 SAF facilities will be required by 2050 and majority of projects are still waiting for FID

EU SAF Capacity: Announced vs Post-FID



EU PtL SAF Capacity: Announced vs Post-FID

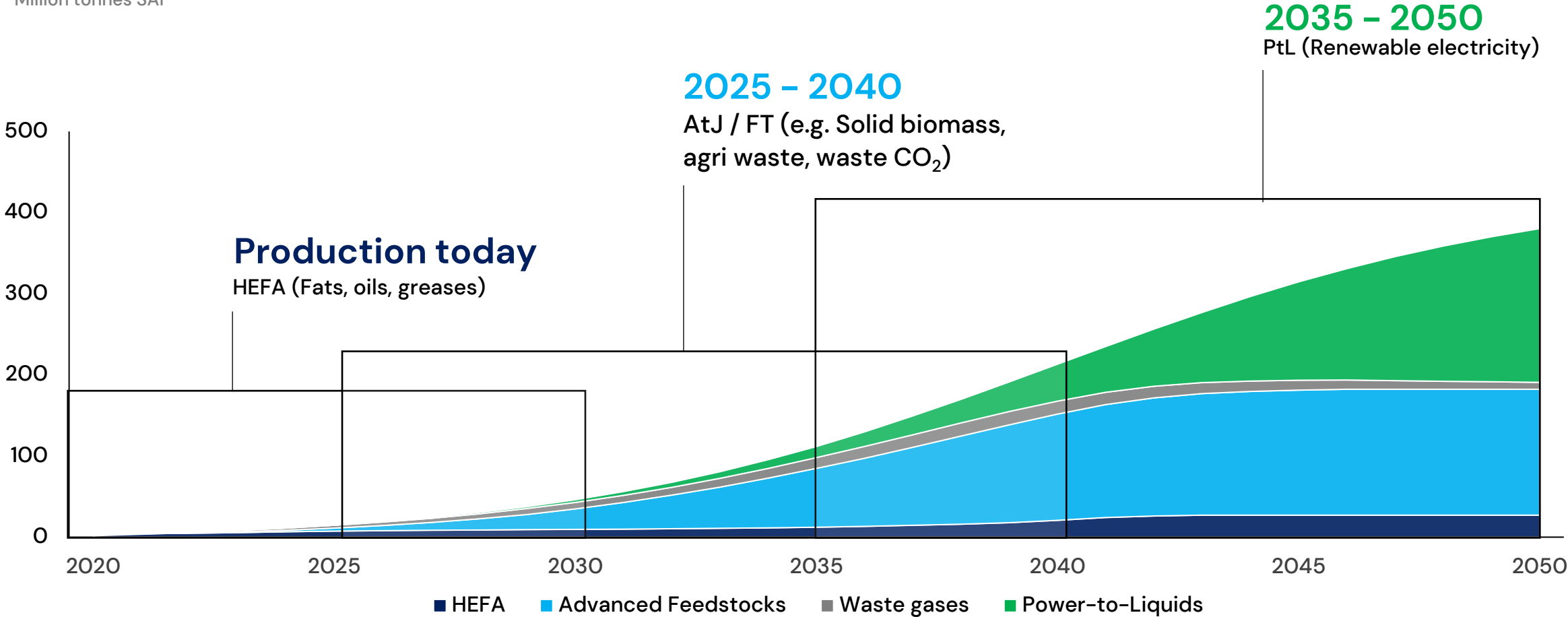


Our decarbonisation ambitions rely on these projects progressing from plans to production

The SAF industry is scaling up through three ways of development, starting with HEFA, followed by AtJ/FT and ultimately PtL

2050 SAF roadmap

Million tonnes SAF



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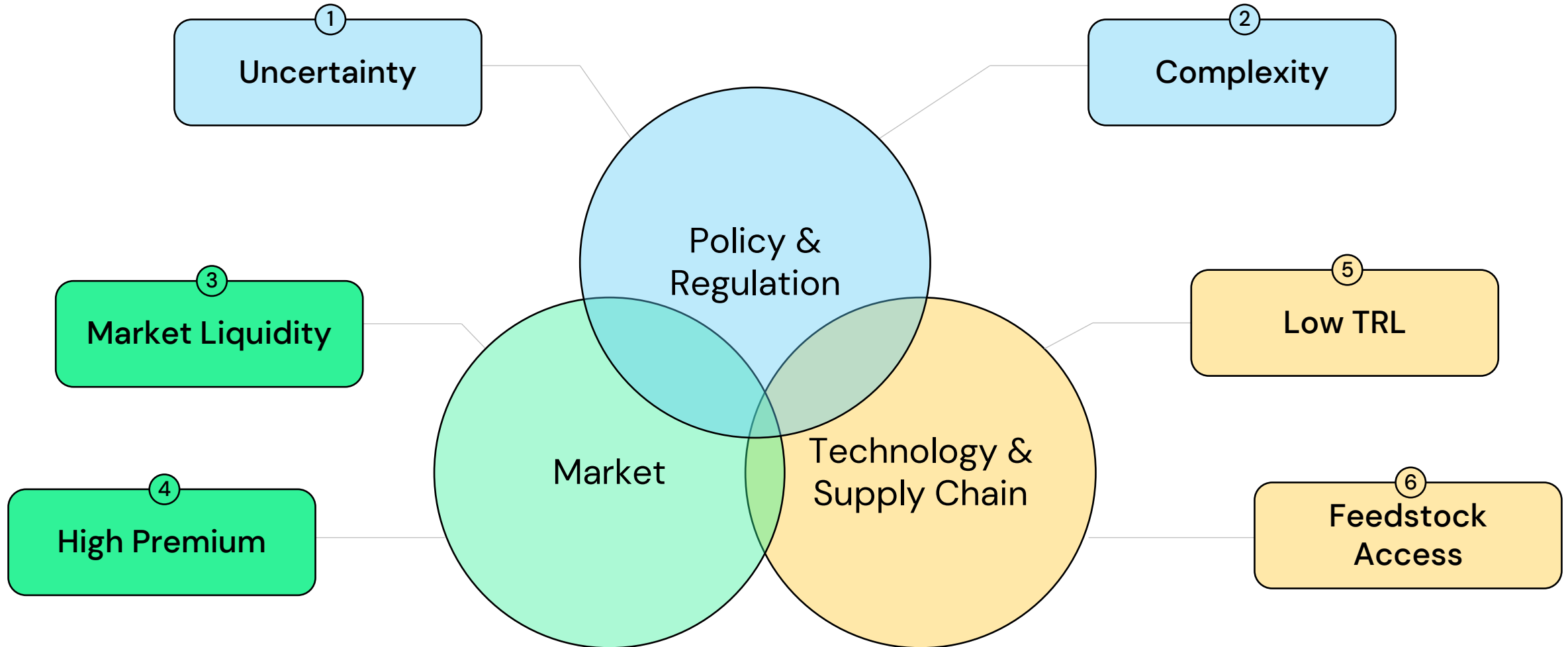
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Getting SAF facilities built

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Policy, market, and technology driven barriers cause risk/return mismatch and lack of investment



Policy and regulation uncertainty and complexity increase the risk of SAF projects

①

Policy & Regulation Uncertainty

Policies takes years to be developed, refined, adjusted

Mandates:

Demand



Price



Incentives:

Demand



Price



②

Policy & Regulation Complexity

Understanding of policy details
and
cross-references

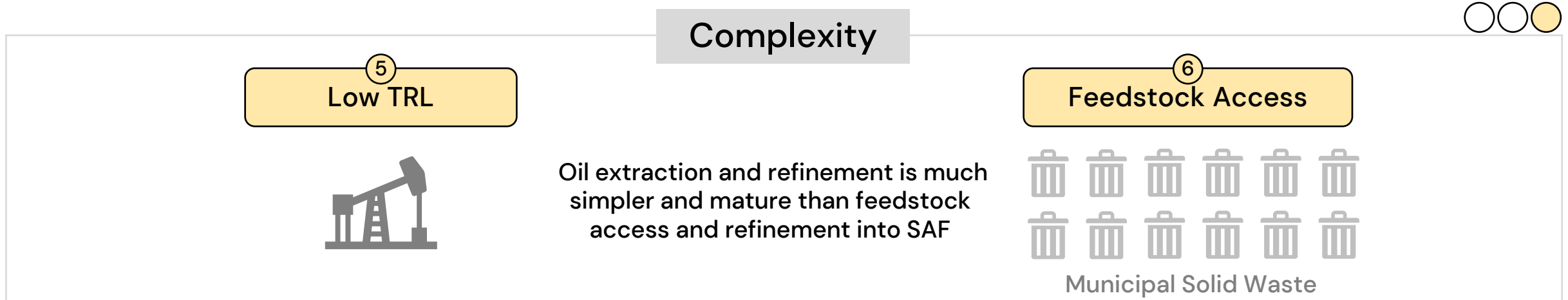
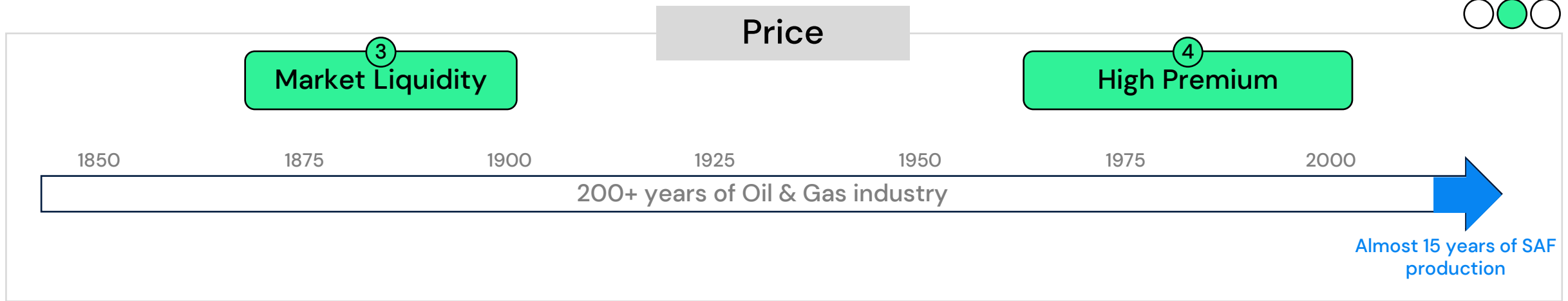


Eligible SAF
definition



Eligible SAF
definition

The market and technology barriers to scaling SAF come down to facing an oil & gas industry that is built on hundreds of years of legacy



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An evolving policy landscape, growing market conditions & strengthening financial support is needed to remove barriers

- With SAF policies and regulations' implementation, our understanding will evolve and the necessity to generate advanced SAF will grow
- This policy-driven SAF demand aims at creating a liquid and mature market to overcome current concerns
- But the industry now needs to realise the announced supply that will not be delivered unless reducing the risks and getting investments



Questions?



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