

ishka SAVi

Sustainable Aviation Intelligence

SPECIAL LIVE WEBINAR:
Looking back to look forward

Thursday 29th February 2024

Understanding and monitoring critical trends in aviation sustainability



Presenters



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Today's webinar

1st part: SAVi Data trends

- Clean propulsion commitments
- Sustainable finance in aviation
- Aviation decarbonisation targets by banks
- SAF offtake and purchase agreement trends
- Reality check: SAF offtakes vs current production

2nd part: SAF Policy in US and EU

- US DoE Biofuel Funding Strategy
- US vs EU Renewable fuel support
- Cost of CO2 abatement comparison – aviation versus others

Live Q&A

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Eduardo Mariz
Senior Analyst and Sustainability Lead

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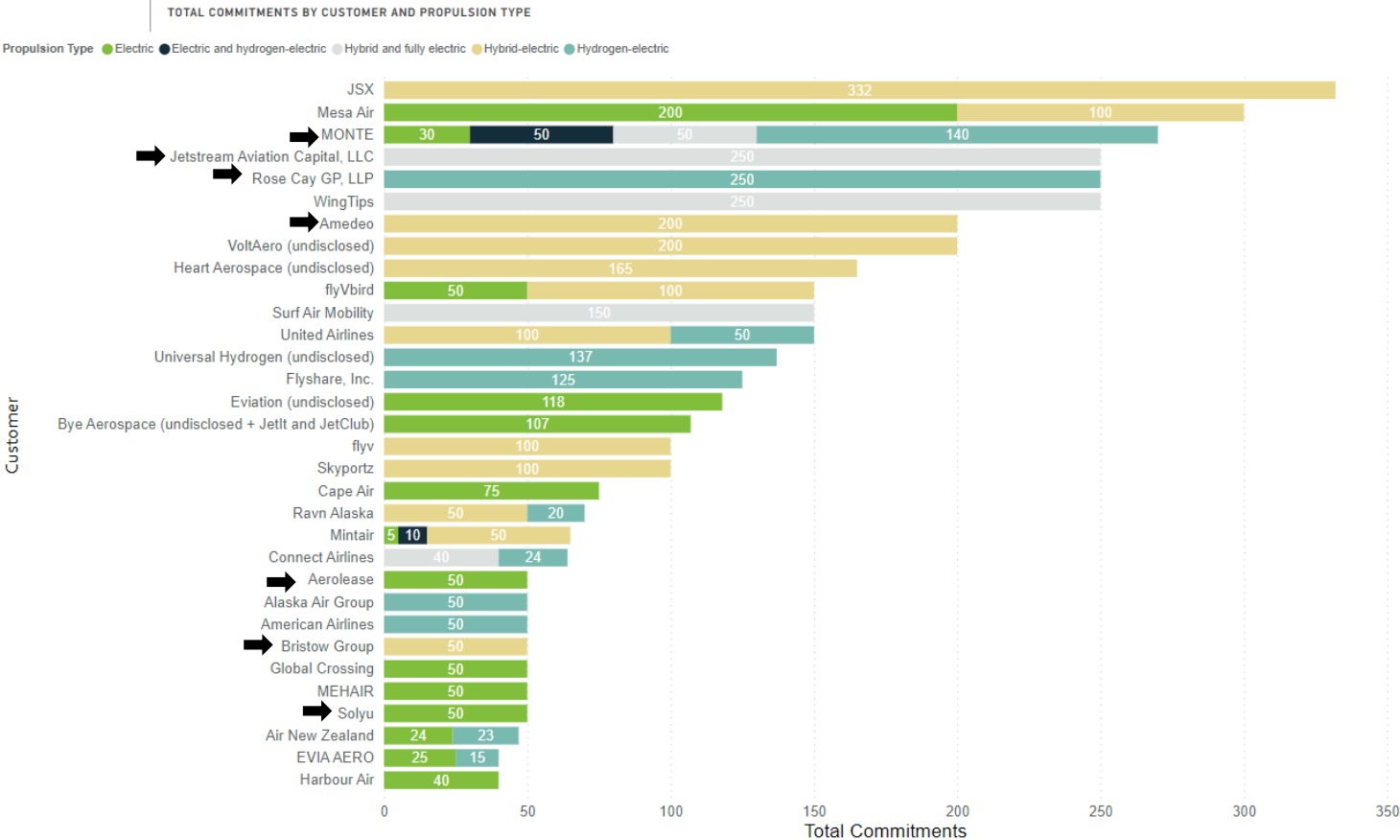
New Propulsion Aircraft & Retrofit Kits



Sustainable Aviation Intelligence

Share by MOU/LOI commitments vs firm orders				
Propulsion type		2021	2022	2023
MoUs and LOIs (incl. options)	↑	89.6%	↓ 77.3%	↓ 74.9%
Firm orders (incl. options)	↓	10.4%	↑ 22.7%	↑ 25.1%
Grand Total		1335	2085	1418
Source: SAVi New Propulsion Tracker				
Share of Propulsion Type Commitments by Year				
Propulsion type		2021	2022	2023
Electric	↓	7.3%	↑ 30.8%	→ 20.5%
Electric and hydrogen-electric	↓	0.0%	↑ 2.9%	→ 0.7%
Hybrid and fully electric	↓	0.0%	↑ 35.5%	↓ 0.9%
Hybrid-electric	↑	57.9%	↓ 20.5%	→ 49.2%
Hydrogen-electric	↑	34.8%	↓ 10.3%	→ 28.7%
Grand Total		1335	2085	1418
Source: SAVi New Propulsion Tracker				

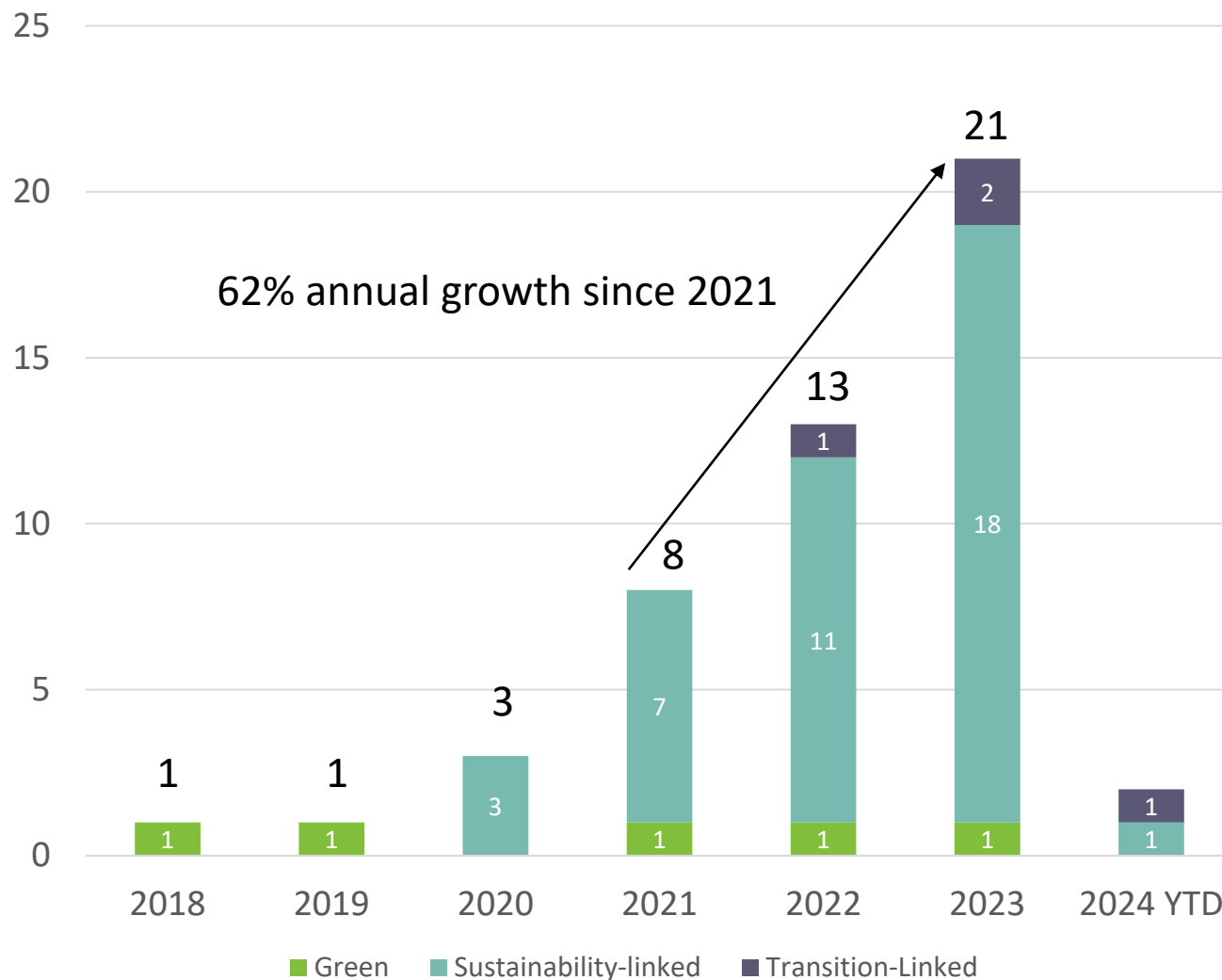
Ishka SAVi's tracks orders and commitments for 51 products by 34 different OEMs and retrofit solution providers. Low-emission and zero-emission propulsion for **fixed-wing aviation** (more than two passengers excluding pilot, not UAM and not e-VTOLs).



2024 Outlook: Sustained commercial interest in clean propulsion technologies without returning to the peak of 2022. More firming of commitments.

Source: Ishka SAVi New Propulsion Tracker

Sustainable Finance Transactions: Growing and maturing



Source: Ishka SAVi Sustainable Finance Tracker

- Another year of strong growth in 2023, maintaining the **62% increase** in publicly announced transactions of 2021 to 2022
- Most deals in 2023 were sustainability-linked loans, with several also incorporating sustainability-linked leases and equity
- **Lessor** borrowers for the first time (SMBC Aviation Capital and CDB Aviation) + CALC (x3 deals, including 2024 YTD)
- Most common **SPTs**: Emissions intensity (11 out of 18), fleet renewal (3 out of 18), and SAF use (2 out of 18).
- **2024 Outlook**: Sustained growth in transactions, more geographical diversity

22 lenders have announced aviation 2030 emissions intensity reduction targets

Bank	Emission intensity	Year	Baseline	Available details	Coverage of GHG	Target scenario
ABanca	-37%	2030	2021	1.269 kg CO ₂ e/RTK (2019) to 0.799 kg CO ₂ e/RTK (2030)	CO ₂ e	IEA Net Zero 2050
Bank of America	-32%	2030	2021	1,007.8gCO ₂ e/RT in 2021 K to 639gCO ₂ e/RTK in 2030	CO ₂ e	IEA Net Zero 2050
Bardclays	-11%	2030	2023	11% reduction)	CO ₂ e	MPP Prudent (MPP PRU)
BBVA (Banco Bilbao Vizcaya Argentaria)	-18%	2030	2022	88g CO ₂ e/pkm in 2022 to 72g CO ₂ e/pkm in 2030	CO ₂ e	
Commerzbank	-12%	2030	N/A	N/A	N/A	N/A
Crédit Agricole CIB	-25%	2030	2019	937.5 CO ₂ eq emissions per RTK (approximated by Ishka) in 2019 to 750 CO ₂ eq emissions per RTK in 2030 (RTK as in "paying transported tonne/kilometre")	CO ₂ e (Well to Wake scope, i.e. including the upstream emissions related to kerosene production).	MPP Prudent (MPP PRU)
DBS Bank	-16%	2030	2020	0.088 kgCO ₂ /p-km (2019) to 0.074 kgCO ₂ /p-km (2030)		IEA Net Zero 2050
First Abu Dhabi Bank P.J.S.C.	-15%	2030	2019	83gCO ₂ e per passenger-km (2019) to 71gCO ₂ e per passenger-km (2030)	CO ₂ e	IEA NZE scenario
HSBC	-25%	2030	2019	84 tCO ₂ /m RPK in 2019 to 63 tCO ₂ /m RPK in 2030	CO ₂	IEA NZE 2050
ING	-33%	2030	2019	88.2 g CO ₂ / passenger km in 2019 to 59.1 g CO ₂ / passenger km in 2030 (calculated by Ishka based on baseline portfolio value reported in ING's 2022 Climate Report)	CO ₂	IEA NZE 2050
JP Morgan Chase	-36%	2030	2021	972.6 g CO ₂ / RTK in 2021 to 625 g CO ₂ / RTK in 2030	CO ₂	IEA NZE 2050
La Banque Postale	-56%	2030	2020	143 gCO ₂ e per passenger per kilometre to 63 gCO ₂ e/p.km	CO ₂ e (unclear scope)	IEA NZE 2050
Lloyds Banking Group	-31%	2030	2019	918 gCO ₂ e/RTK in 2019 to 633 gCO ₂ e/RTK by 2030	CO ₂ e (unclear scope)	IEA NZE 2050 (IEA ETP 2020 scenario)
National Australia Bank Limited	-26%	2030	2019	104 gCO ₂ -e/pkm in 2019 to 77 gCO ₂ -e/pkm in 2030	CO ₂ e	ATAG Waypoint 2050
NatWest Group	-28%	2030	2019	No carbon intensity reduction figures made available. NatWest Group is targeting to align its scope 1 + 2 + 3 portfolio temperature score by loan value from the corporate loan Other sectors (including aviation) portfolio from 3.2°C in 2019 to 2.3°C by 2030.		IEA ETP B2DS (World)
OCBC Bank	-66%	2030	2021	0.261 kgCO ₂ /passenger-km in 2021 to 0.088 kgCO ₂ /passenger-km in 2030	Scope 1 (operators) and Scope 3 (lessors)	IATA Fly Net Zero
Rabobank*	-37%	2030	2020		All transportation	
Santander	-33%	2030	2019	92.47 grCO ₂ e/m RPK in 2019 to 61.71 grCO ₂ e/m RPK in 2030	CO ₂ e (unknown)	N/A
Standard Chartered	-34%	2030	2022	1,152g CO ₂ e/RTK in 2022 to (approximately, Ishka calculation) 760g CO ₂ e/RTK in 2030	CO ₂ e (unknown)	N/A
TD Bank Group	-8%	2030	2019	87 gCO ₂ /pkm in 2019 to 80 gCO ₂ /pkm in 2030	N/A	N/A
Wells Fargo & Company	-20%	2030	2019	969 g CO ₂ e/RTK in 2019 to 775 g CO ₂ e/RTK in 2030	CO ₂ e (offsets not included)	Not based on any scenario, but based on improvements the bank believes its clients "can achieve" through operational and fuel efficiency improvements and aligned with CORSIA
Average -29%						

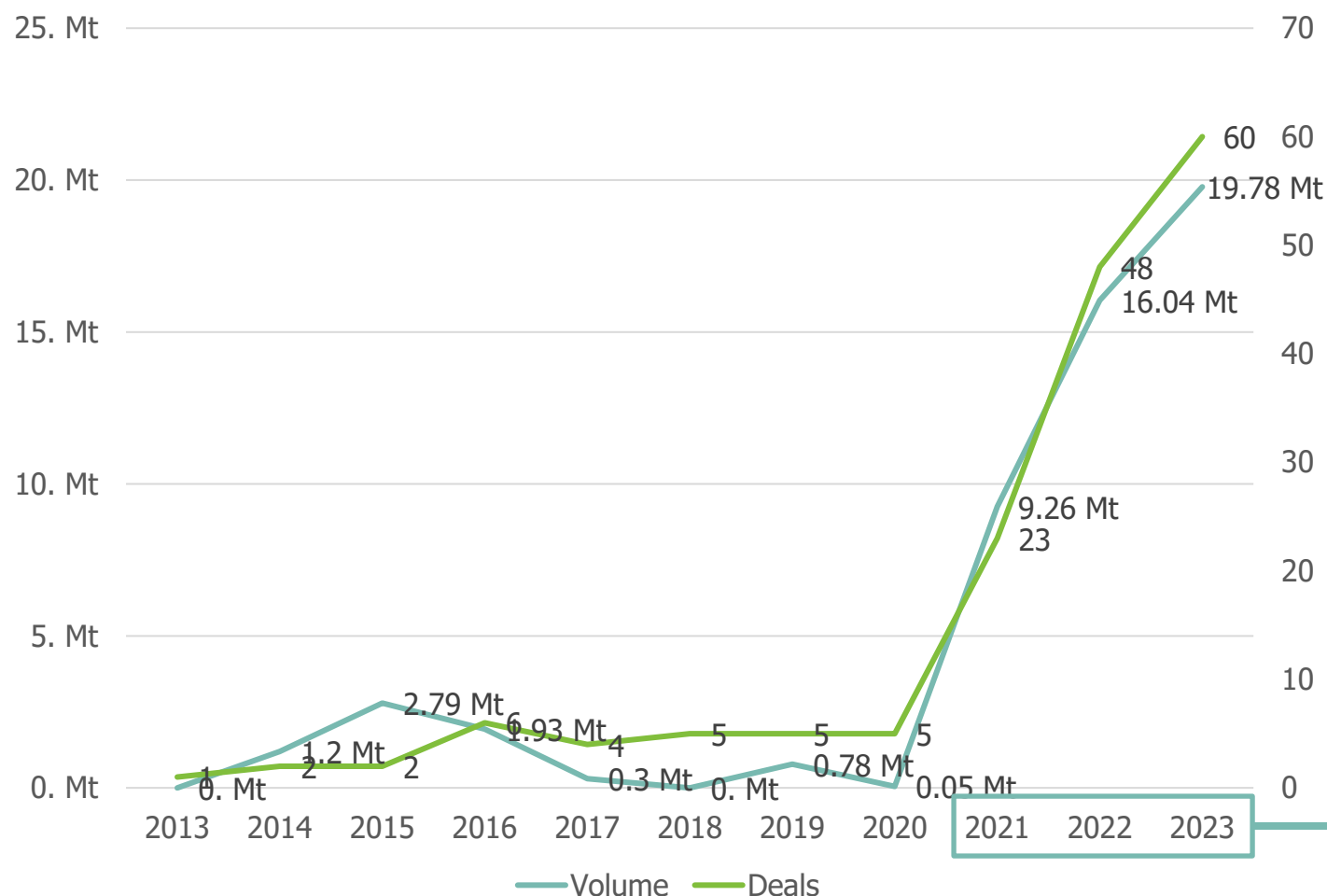
Source: Disclosures by 80 banks analysed by Ishka. Units are included as-reported by each institution. *Target for transportation, not just aviation

22 banks now have aviation interim decarbonisation targets by 2030

- **Up from 14** in our last update (July 2023)
- **Nine** more lenders expected to announce aviation targets and another **22** lenders deemed likely to announce aviation or transportation targets
- Based on a sample of 80 major lenders chosen based on size, aviation finance presence, and NZBA/Impact/Pegasus membership

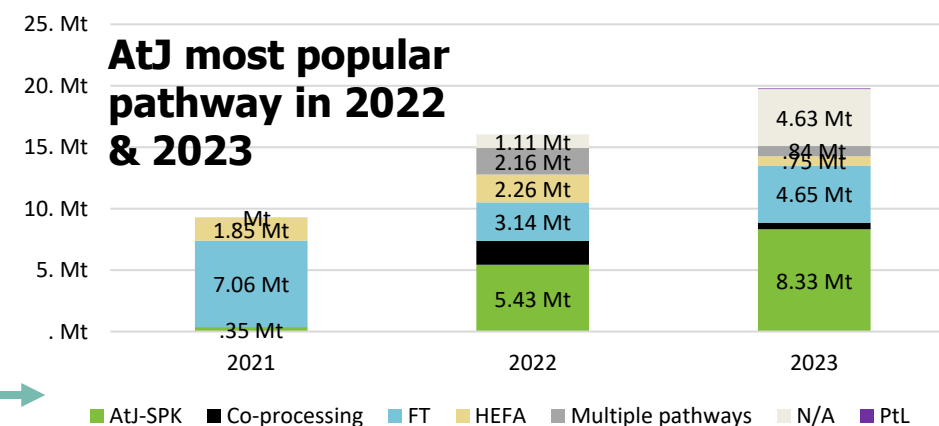
SAF: Offtakes in 2023 grew, but lost momentum

Publicly announced SAF Offtake & Purchase Agreements by Volume and Deals (2013 to 2023)



2023 Highlights:

- **Slowing growth** versus 2022, when deals and total SAF volume grew x2 versus 2021
- **Larger deals** – Three of the five largest offtake agreements ever were announced in 2023 (United/Blue Blade Energy, United/Cemvita, Southwest USA BioEnergy)
- **Europe leads.** Of the 60 deals: Europe (27), North America (18), Asia-Pacific (9), Middle East (4), and Latin America (2).



2024 Outlook: Stagnant or even slightly lower number of offtake agreements, but a greater proportion of advanced pathways such as PtL

SAF Leaderboard: Can purchases and offtakes show the way?

SAF Leaderboard airlines, deliveries by year*

Airline	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Air Canada	7.6K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K
Air France-KLM	317.5K	317.5K	317.5K	317.5K	377.5K	377.5K	415.0K	415.0K	252.5K	140.0K	60.0K	60.0K	60.0K	60.0K
Alaska Airlines	15.1K	15.1K	2.2K	114.3K	114.3K	114.3K	114.3K	114.3K	2.2K	0.0K	0.0K	0.0K	0.0K	0.0K
All Nippon Airways	0.0K	0.0K	125.0K	125.0K	125.0K	125.0K	125.0K	125.0K	125.0K	125.0K	125.0K	125.0K	0.0K	0.0K
American Airlines	0.0K	20.8K	20.8K	323.6K	323.6K	323.6K	323.6K	323.6K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K
Cathay Pacific	113.6K	113.6K	120.1K	120.1K	120.1K	120.1K	120.1K	120.1K	120.1K	0.0K	0.0K	0.0K	0.0K	0.0K
Cebu Pacific	0.0K	0.0K	0.0K	25.0K	25.0K	25.0K	25.0K	25.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K
Delta	242.6K	318.0K	302.8K	302.8K	469.4K	469.4K	242.3K	242.3K	242.3K	242.3K	242.3K	0.0K	0.0K	0.0K
Deutsche Post DHL	128.0K	128.0K	128.0K	128.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K
Finnair	0.8K	0.0K	3.0K	3.0K	24.2K	24.2K	24.2K	24.2K	24.2K	0.0K	0.0K	0.0K	0.0K	0.0K
Hawaiian Airlines	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	30.3K	30.3K	30.3K	30.3K	30.3K	0.0K	0.0K	0.0K
IAG	170.0K	146.1K	157.3K	289.3K	289.3K	307.5K	307.5K	307.5K	51.5K	51.5K	22.1K	22.1K	22.1K	0.0K
Japan Airlines	0.0K	0.0K	145.5K	145.5K	156.6K	156.6K	156.6K	156.6K	156.6K	125.0K	125.0K	125.0K	0.0K	0.0K
JetBlue	48.1K	45.1K	77.0K	31.9K	122.7K	122.7K	122.7K	106.0K	106.0K	15.1K	15.1K	15.1K	0.0K	0.0K
Lufthansa Group	100.0K	357.0K	357.0K	381.2K	381.2K	381.2K	381.2K	381.2K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K
Malaysia Aviation Group	0.0K	0.0K	0.0K	0.0K	23.0K	23.0K	23.0K	23.0K	23.0K	23.0K	23.0K	23.0K	23.0K	23.0K
Qantas	32.2K	32.2K	30.3K	30.3K	30.3K	430.3K	430.3K	406.1K	6.1K	0.0K	0.0K	0.0K	0.0K	0.0K
Qatar Airways	1.5K	1.5K	0.0K	0.0K	0.0K	15.1K	15.1K	15.1K	15.1K	15.1K	0.0K	0.0K	0.0K	0.0K
Ryanair	20.4K	19.9K	105.8K	105.8K	105.8K	105.8K	105.8K	105.8K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K
SAS	0.0K	15.1K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K	0.0K
Southwest Airlines	0.0K	0.0K	0.0K	44.2K	44.2K	147.2K	147.2K	147.2K	147.2K	147.2K	147.2K	147.2K	147.2K	147.2K
United Airlines	330.1K	325.5K	545.1K	545.1K	545.1K	1,105.2K	1,105.2K	1,105.2K	1,105.2K	832.7K	832.7K	832.7K	832.7K	832.7K
Virgin Atlantic	20.3K	30.3K	30.3K	30.3K	60.6K	60.6K	30.3K	30.3K	30.3K	30.3K	30.3K	30.3K	30.3K	30.3K
Wizz Air	23.1K	23.1K	35.1K	35.1K	35.1K	58.1K	58.1K	58.1K	35.0K	35.0K	35.0K	35.0K	35.0K	35.0K
Total	1,580.9K	1,908.9K	2,502.8K	3,098.0K	3,373.0K	4,492.5K	4,302.8K	4,261.9K	2,472.6K	1,812.5K	1,688.0K	1,415.4K	1,150.3K	1,128.2K

Implausible.
0.5 Mt SAF
produced in 2023
(IATA)

Optimistic.
1.87 Mt SAF to be
produced in 2024 (IATA)

*Data for a sample of 24 leading airlines. Delivery timelines correct at the time of announcement with some assumptions for missing data derived from associated project timelines. Near-term deliveries may be based on out-of-date announcements and are likely to significantly overrepresent actual SAF deliveries to those airlines.

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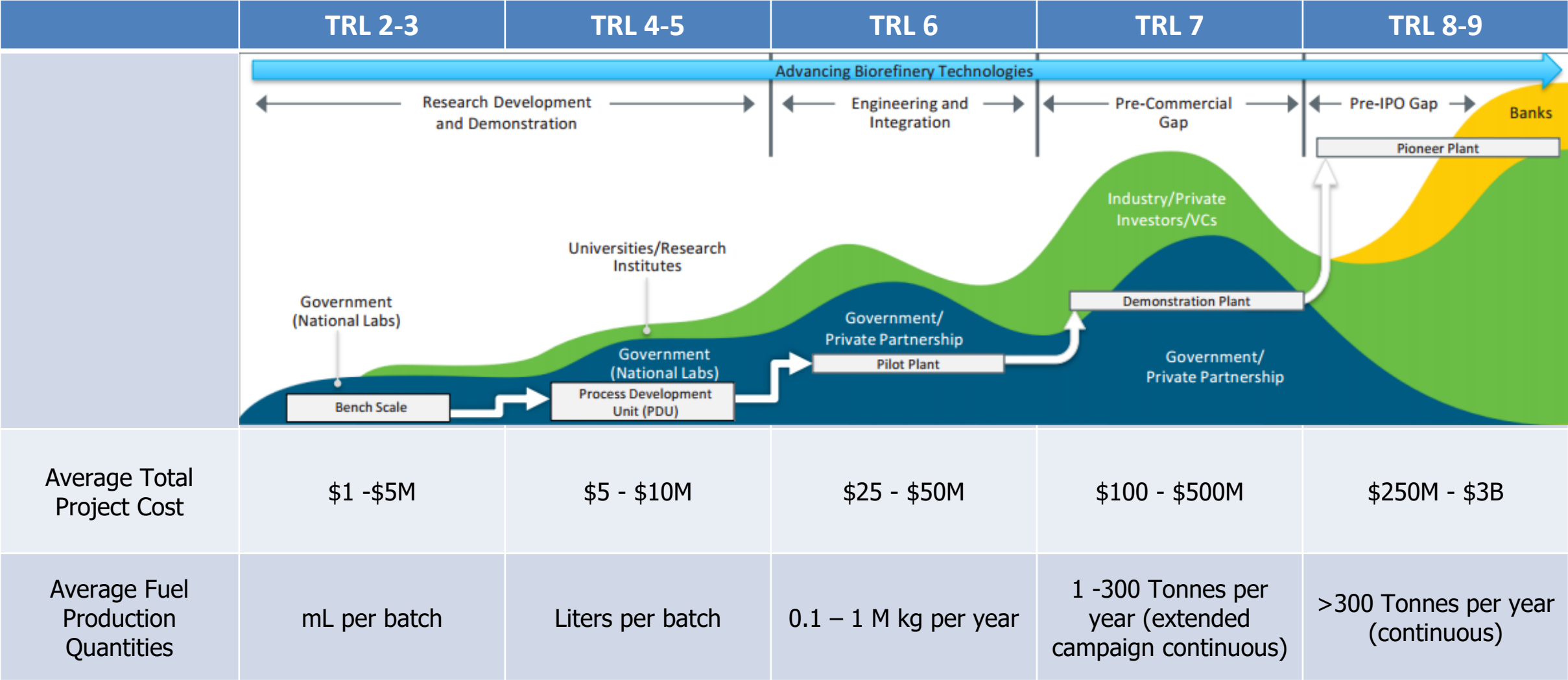
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Funding SAF Projects: US DoE Biofuel Funding Strategy



US v EU Renewable Fuel Investment Support

US Investment Support


1. Bipartisan Infrastructure Law (BIL) (Nov 2021)
 - \$63B for energy and climate
2. CHIPS and Science Act (July 2022) \$280B
 - Cutting-edge science and innovation to boost American competitiveness, including for semiconductors
3. Inflation Reduction Act (IRA) (August 2022)
 - Incentivizes deployment of clean technologies and lowering energy costs for American families
 - \$391B for clean energy

EU Investment Support

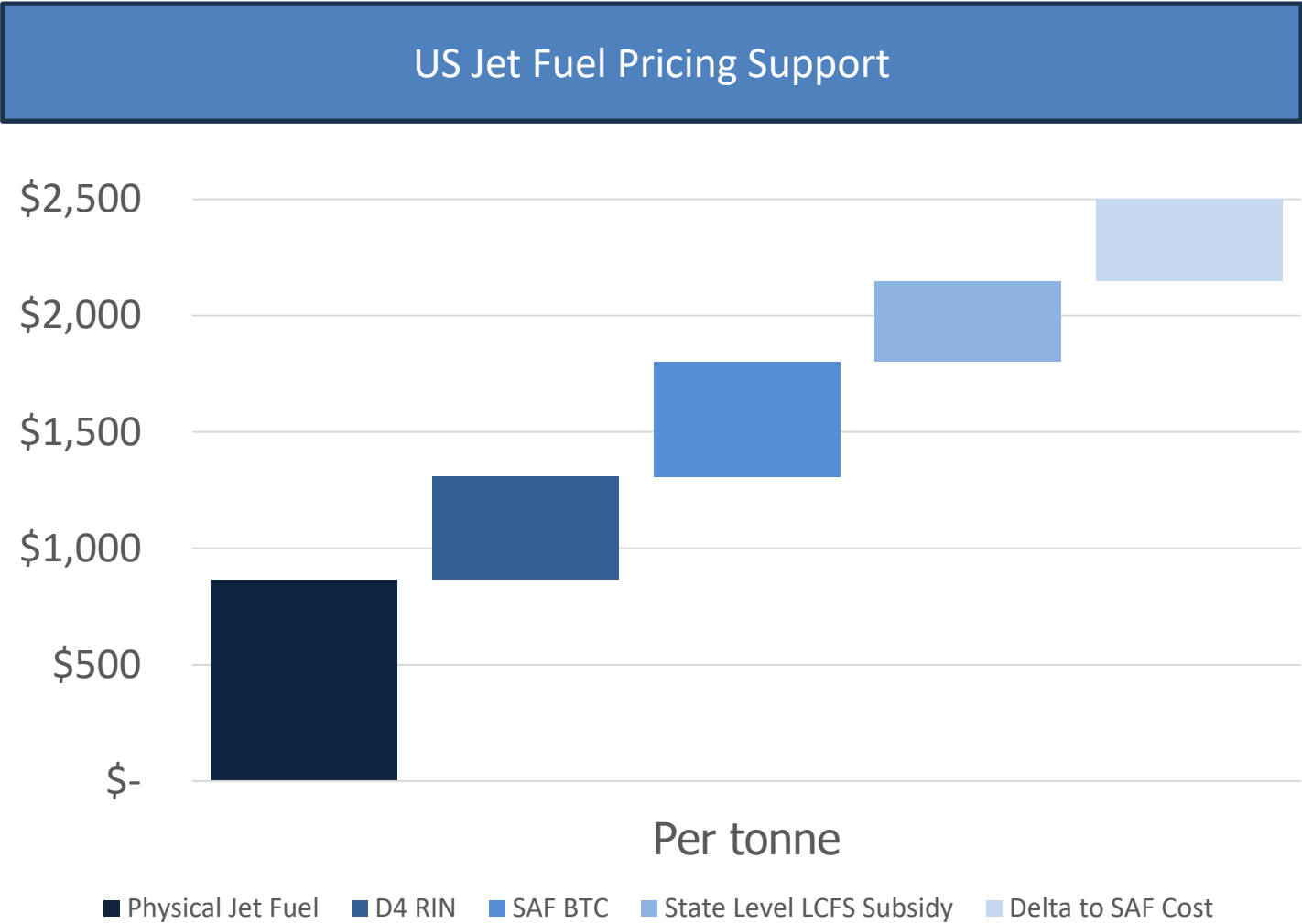
EU's European Green Deal provides a similar amount of financing \$750Bn.

Yet to see a significant volume of capital going toward SAF production.

EU policy does not show the same level of aligned thinking seen in the US – **during the current administration**

- 
- US SAF Projects are fishing for funding a **\$750Bn**-sized pond
 - DoE's Loan Program Office has \$400Bn to distribute
 - Will this program survive a change in the WH?

US v EU Jet Fuel Pricing Support



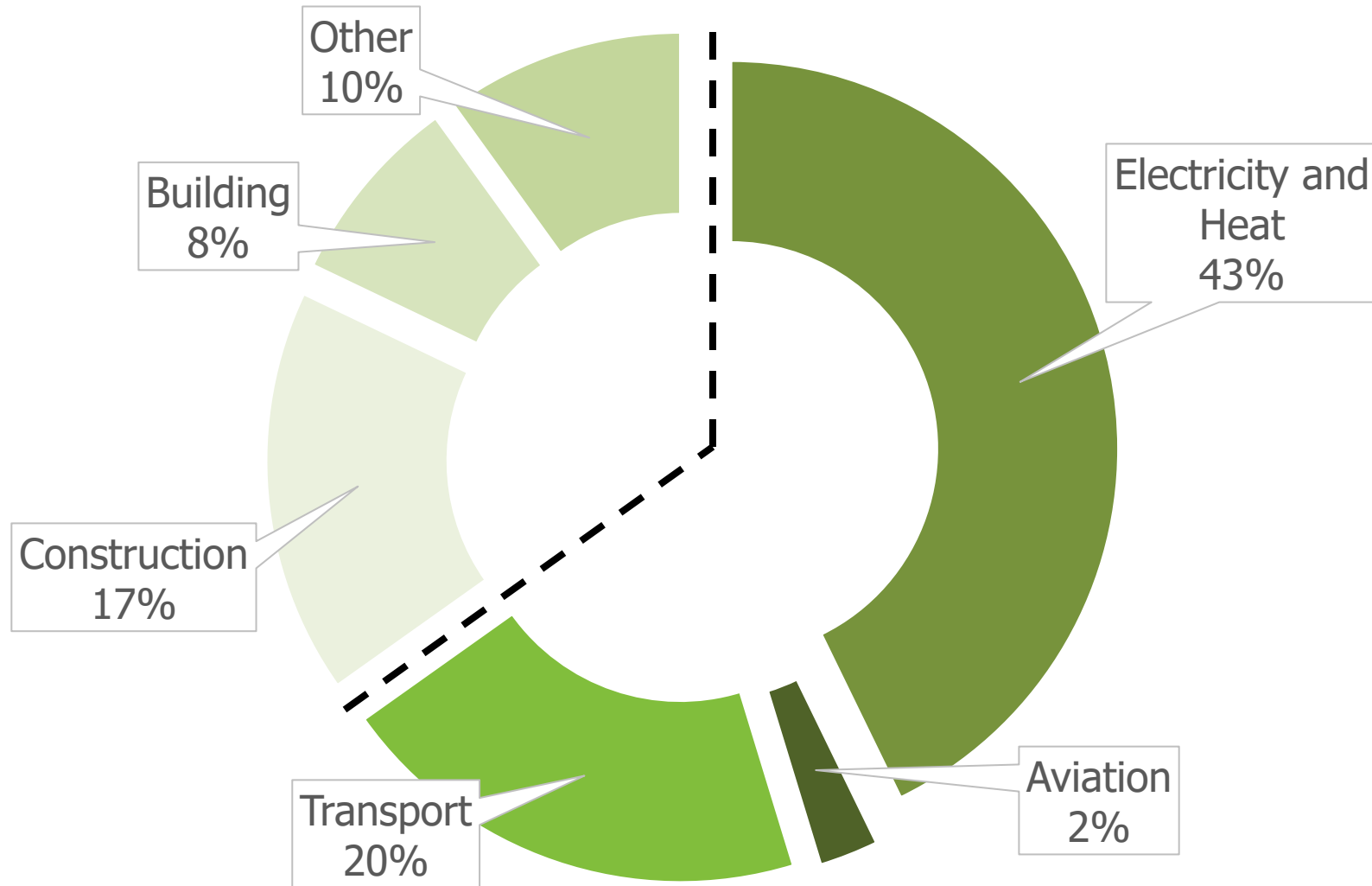
Source: Ishka SAVi Sustainable Finance Tracker

EU Jet Fuel Pricing Support

€2Bn is funding delivered over 3 years via ETS rebates.

Airlines will still need to fund their upfront SAF costs, but they will be able to reclaim up to 100% of the price difference when they report their 2024 emissions in September 2025. This cost gap will be repaid through EU ETS allowances, worth around €2 billion, on a first-come first-served basis.

All Sector CO2 Cost Per Ton Abated



Aviation CO2 Abatement Cost

- SAF @ \$3,000 per Tonne & 80% CI Score = \$850/Ton CO2
- EU ETS = \$100/Ton CO2
- High Quality Nature Based Products = \$50/Ton CO2

Other Sector CO2 Abatement Cost

- In many cases the LCOE is lower from renewable sources

Be careful what you wish for...



...the industry should not lose control of the narrative

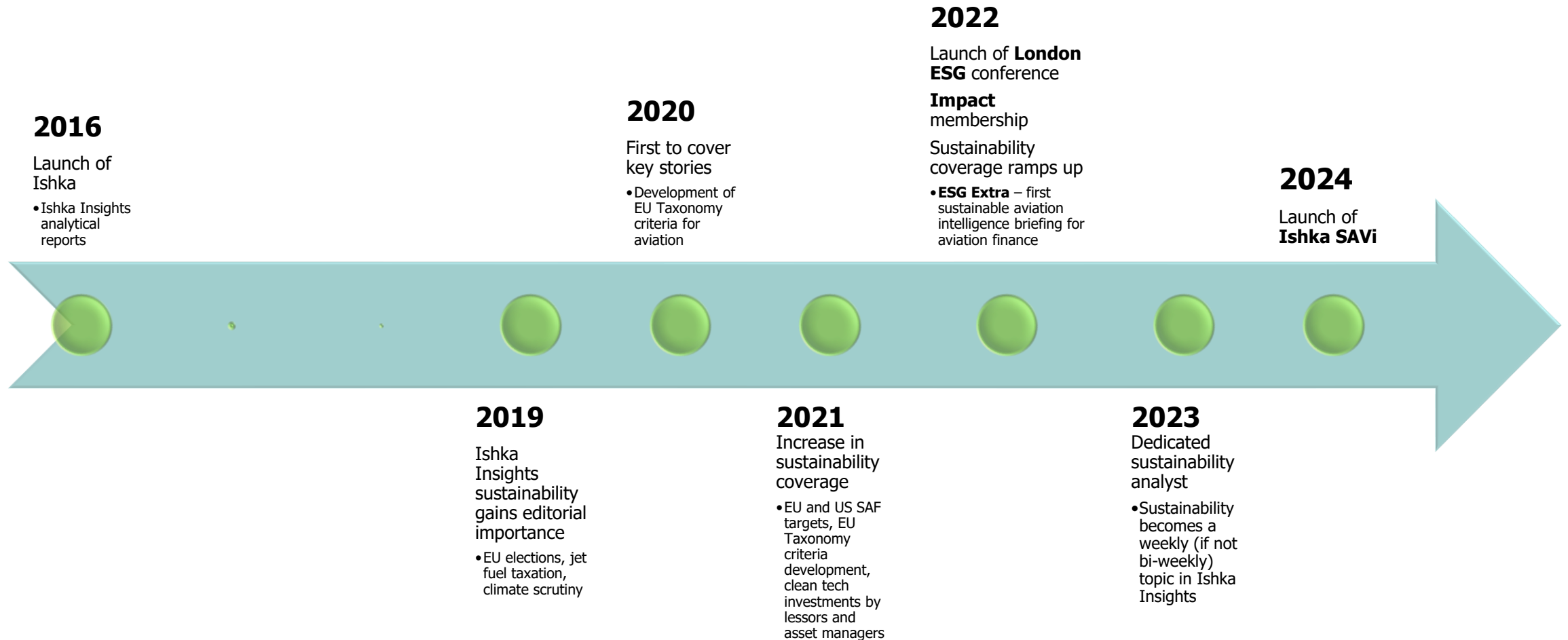
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Sustainable Aviation Intelligence

- Short-form reports and analysis
- Dynamic data dashboards
 - SAF Tracker
 - SAF Leaderboard
 - Sustainable Finance Deal Tracker
 - New Propulsion Orders & Commitments
- Essential resource library



A quick introduction to Ishka SAVi



A quick introduction to Ishka SAVi

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Weekly, one page

Bi-monthly, 12 – 16 pages

Analytical reports

- Weekly
- Bi-monthly
- Analysis
- Webinars (coming soon)

Data Dashboards

- SAF Tracker (offtakes and purchases)
- Airline SAF Leaderboard
- Sustainable Finance Deal Tracker
- New Propulsion Orders

Resource Library

SAVi Five: Singapore Swiss looks at SAF market

Eduardo Meriz Senior Analyst at Ishka

Listen to the article

0:00 / 6:53

Five noteworthy aviation sustainability developments

Here are the new developments to keep an eye on:

- 1. Singapore to require 1% SAF by 2025, which sets out Singapore's action plan for decarbonisation (State Action Plan).
- The most distinctive policy of the Singapore's State Action Plan to achieve decarbonisation (State Action Plan).
- "Willing" for a 1% SAF target in 2025 adoption of SAF.
- Introducing a "third quantum" SAF price, the actual SAF price differs from a levy and prevailing SAF price.
- From a passenger perspective, the increase in ticket price for an economy and \$16 (in USD, \$2 to \$12) more.

Resource Library									
The one-stop source for documents, white papers and guides to inform aviation finance ESG decisions									
Title	Date	Authors	Region	Tags	Type	Pages	PDF		
Avolon Sustainability Report 2023	08/02/2024	Avolon	Global	ESG Disclosure, ESG Reporting, Leasing	Report	64			
Refuelling Aviation in the US: Evolution of US Sustainable Aviation Fuel Policy	01/02/2024	Rocky Mountain Institute (RMI)	North America	SAF, SAF Incentives, SAF policy, United States	Report	29			
Shanghai Transition Finance Taxonomy (Trial) (In Chinese) - Word document searchable	01/02/2024	Shanghai Municipal Financial Regulatory Bureau	Asia Pacific	China, Regulation, Sustainable finance criteria, Taxonomy	Regulation (final)	25			
Shanghai Transition Finance Taxonomy (Trial) (In Chinese) - PDF	01/02/2024	Shanghai Municipal Financial Regulatory Bureau	Asia Pacific	China, Regulation, Sustainable finance criteria, Taxonomy	Regulation (final)	25			
Dutch airline industry calls for joint action agenda (In Dutch)	11/01/2024	KLM and 30 other Dutch aviation firms and institutions	Europe	Airlines, KLM, Netherlands	Declaration	10			
SMBC TFCD 2023 Report	01/01/2024	SMBC Aviation Capital	Global	ESG Disclosure, ESG Reporting, Leasing, Reporting	Report	17			
CANSO/EUROCONTROL Sustainable Skies Conference: Contrails In Focus	08/11/2023	Eurocontrol	Europe	Non-CO2, Non-CO2 effects	Briefing	59			
Ticket Prices of Planes vs Trains - A Europe-Wide Analysis	01/09/2023	Greenpeace	Europe	Rail versus aviation	Study	136			
2026 COMMERCIAL DEMONSTRATOR: EXPRESSION OF INTEREST - NEW ZEALAND AIRPORTS	01/09/2023	Air New Zealand	Asia Pacific	Airlines, Airports, Infrastructure		19			
Decarbonizing Aviation: Mission Possible	01/09/2023	OpenAirlines	International	Education, Roadmap or Lever Recommendations	e-book	87			
WIZZAIR ANNUAL REPORT FY 2023	01/09/2023	Wizz Air	International	Airlines, Emissions, Reporting, Sustainability	Report	226			
Airlines for Europe (A4E) Position Paper and Recommendations on Non-CO2 Monitoring, Verification and Reporting under the EU ETS	29/08/2023	Airlines for Europe (A4E)	Europe	Monitoring, Non-CO2, Verification	Position Paper	11			
Aviation Capital Group (ACG) 2022 ESG Report	24/08/2023	Aviation Capital Group (ACG)	Global	ESG Disclosure, ESG Reporting, Leasing	Report	66			
EUROCONTROL Think Paper #21 - Long-haul flight decarbonisation: When can cutting-edge energies & technologies make a difference?	22/08/2023	EUROCONTROL	Europe	Electric propulsion, Hydrogen propulsion	White Paper	20			
Taskforce for Nature-related Financial Disclosures - Core Metrics	21/08/2023	Eco-Business	International	Metrics, pollutants, transition	Report				
Declaration: International Aviation Climate Ambition Coalition	14/08/2023	UK Department for Transport	International	ICAO, Roadmap or Lever Recommendations	Declaration				
UK Sustainability Disclosure Standards	02/08/2023	UK Department for Transport	Europe	ESG Disclosure	Regulation (in process)				
Pointless: The climate impact of frequent flyer status	01/08/2023	Possible	Europe	Demand-side lever	Report	25			

Questions?

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