



PRE-EVENT
OUTCOMES CONSULTATION

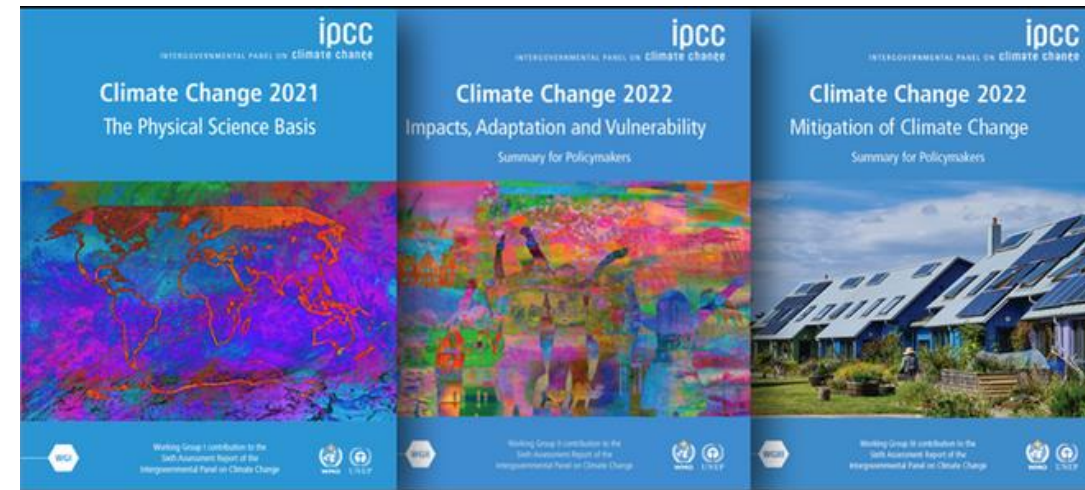
25 - 26 SEPTEMBER 2023 | ICAO HQ



Jane Hupe

Deputy Director, Environment,
ICAO





Climate & Energy | Climate Change

Summer 2023 was hottest on record, scientists say

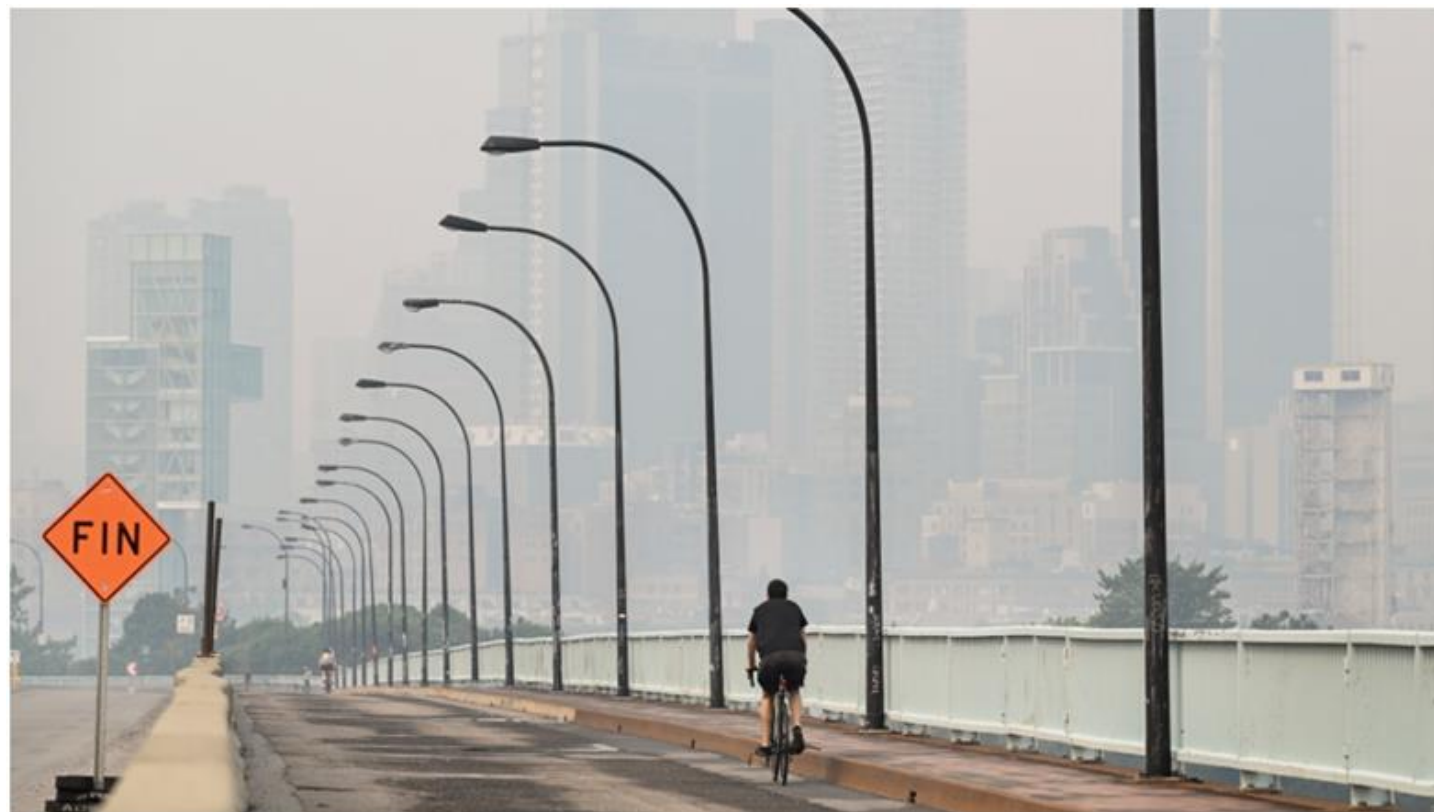
Reuters

September 7, 2023 2:43 AM EDT - Updated 6 days ago

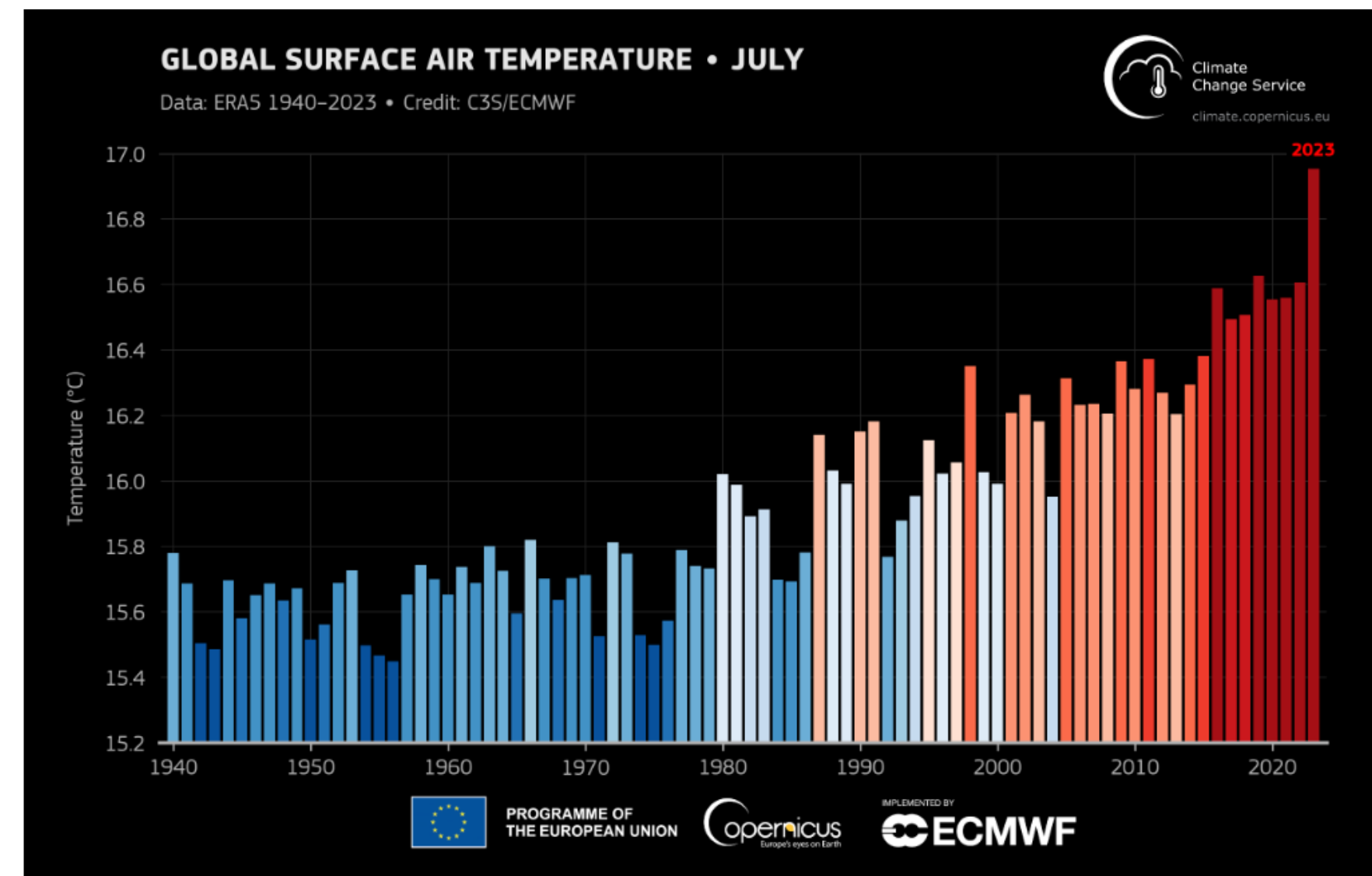


Aa

AR6 Synthesis Report Climate Change 2023



The skyline of Montreal is obscured by a haze of smog, Sunday, June 25, 2023, as a smog warning is in effect for Montreal and multiple regions of the province due to forest fires. THE CANADIAN PRESS/Graham Hughes



Globally averaged surface air temperature for all months of July from 1940 to 2023. Shades of blue indicate cooler-than-average years, while shades of red show years that were warmer than average. Data: ERA5. Credit: C3S/ECMWF.





2010

2016

2017

2018

2020

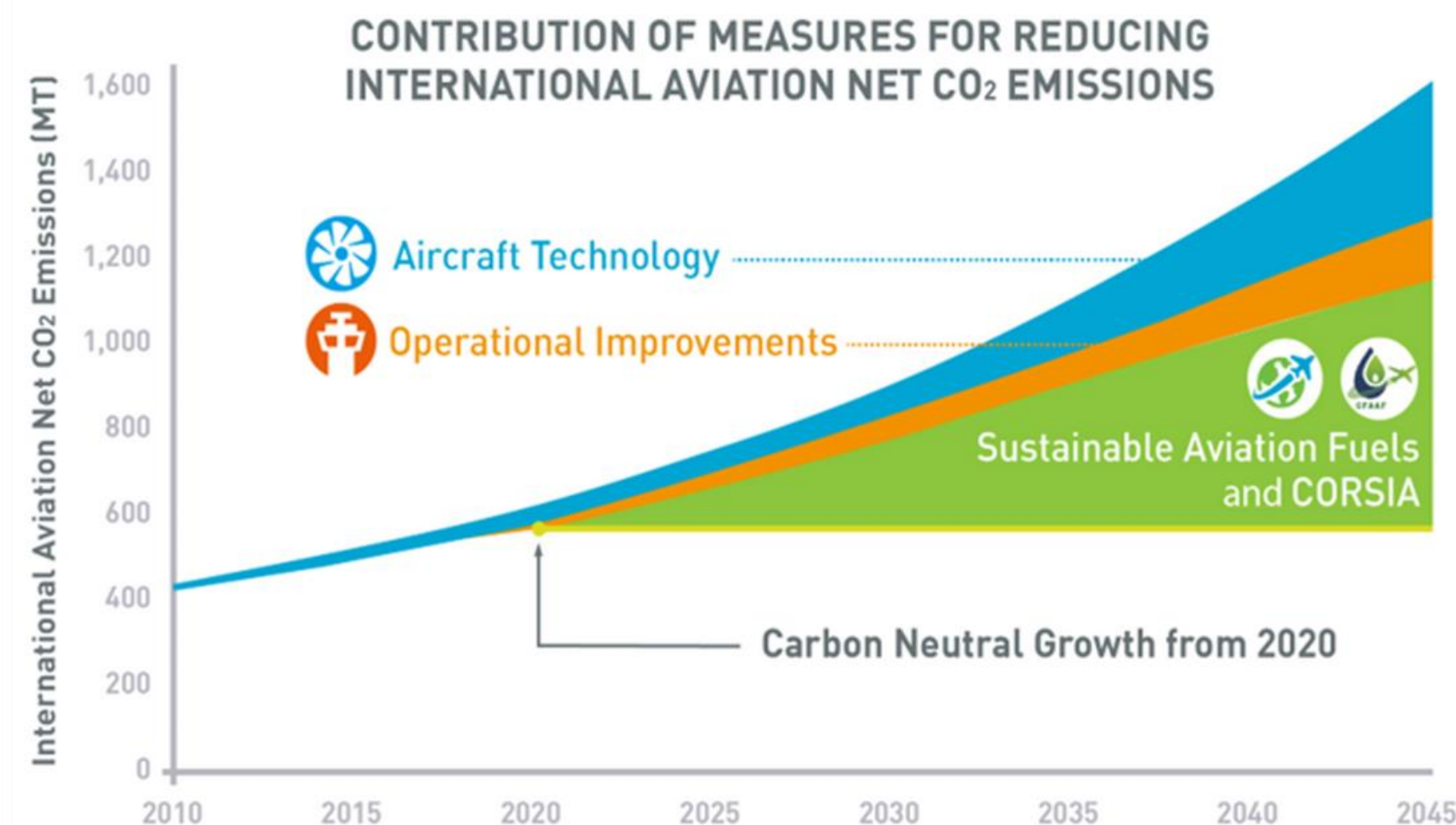
2021

2022

The 37th Session of ICAO Assembly:

Adoption of two Global Aspirational Goals

- 2% annual fuel efficiency improvement
- Carbon neutral growth from 2020





2016

2017

2018

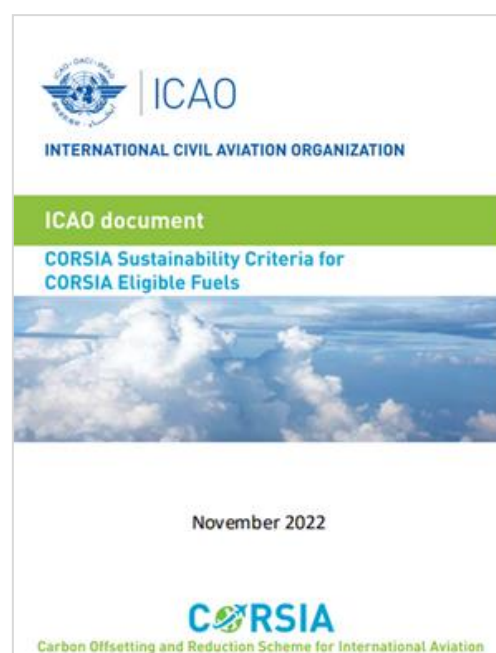
2019

2020

2021

- 2016 (39th ICAO Assembly) historic agreement on a global market-based measure : CORSIA
- 2018: New Annex 16 Volume IV
- 2018: ACT-CORSIA with more than 130 States
- 2019 : Eligibility criteria for emissions units
- 2019, 2021 and 2022 : Sustainability criteria for SAF, expanded to LCAF

CORSIA





2017

2018

2019

2020

2021

2022

- 2017 : Mandatory CO2 certification standard for aircraft (Annex 16 Volume III)
- 2017: CAAF/2 and 2050 ICAO Vision for SAF
- 2020 onwards: ICAO work on LTAG feasibility
- 2022 : ICAO ACT SAF Programme
- 2022 : Adoption of the LTAG of Net Zero CO2 emissions by 2050



ICAO LTAG NET-ZERO 2050

Long-term global aspirational goal for international aviation

represents a

NEW BEGINNING





LTAG Report Appendixes (English only)



Appendix B1
Background
(18 pages)



Appendix R1
Summary Sheets
(61 pages)



Appendix R2
Comparison to Trends
(8 pages)



Appendix R3
Results in the Climate
Science Context
(10 pages)



Appendix S1
Climate Science Context
(24 pages)



Appendix M1
Overview of the Modelling
Approaches
(99 pages)



Appendix M2
COVID-19 Forecast
Scenario Development
(8 pages)



Appendix M3
Technology
(181 pages)



Appendix M4
Operations
(12 pages)



Appendix M5
Fuels
(84 pages)



Available on the ICAO website

www.icao.int/environmental-protection/LTAG/Pages/LTAG-and-Fuels.aspx



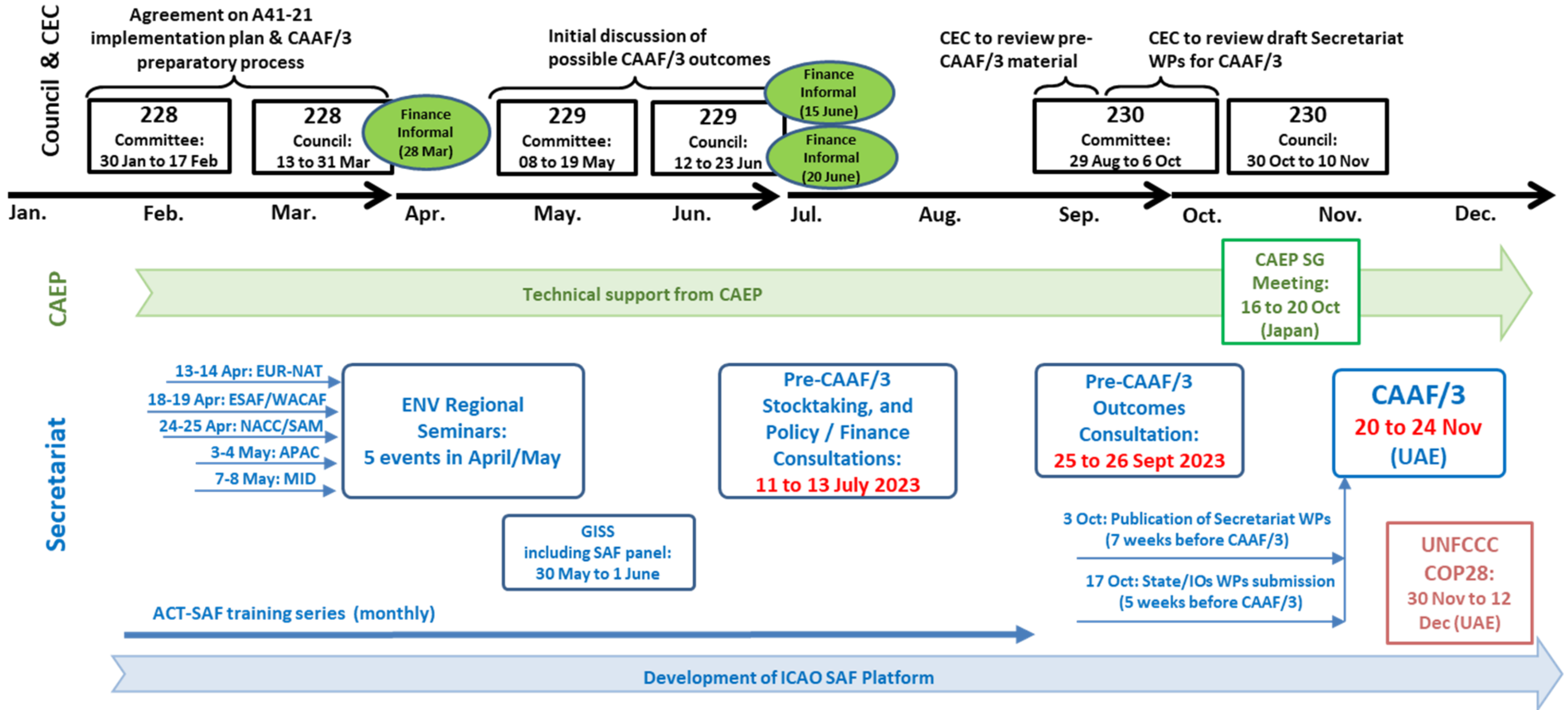
NET
ZERO

Co.
2





2023 timeline toward CAAF/3





ICAO Environmental Regional Seminars (2023)





Material provided to Regional Seminars on ICAO Guidance on Potential Policies and Coordinated Approaches for the Deployment of SAF (Building Block 1)



Developed by CAEP based on studies performed since 2016.

- A **policy toolkit** to be used in combination with the SAF Rules of Thumb
- A **support reference** for ICAO States to develop SAF production
- **Insight on types of policy measures** and their impacts
- **Examples of policies** used or under preparation
- Links to **additional helpful resources**

2023 Updates

- Inclusion of latest policies from EU, United States and United Kingdom
- Improved outreach material (executive summary, and detailed presentation)
- Available on the ICAO website
https://www.icao.int/environmental-protection/Pages/saf_guidance_potential_policies.aspx



Details Available on the ICAO website

https://www.icao.int/environmental-protection/Pages/saf_guidance_potential_policies.aspx



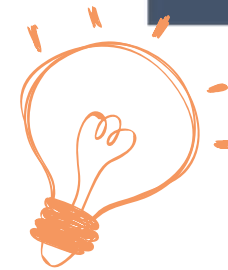
Material provided to Regional Seminars on SAF estimates (“Rules of thumb”) (Building Block 1)

ICAO SAF “Rules of Thumb” provide **order of magnitude estimations on SAF costs, investment needs and production potential** to inform policymakers and project developers.

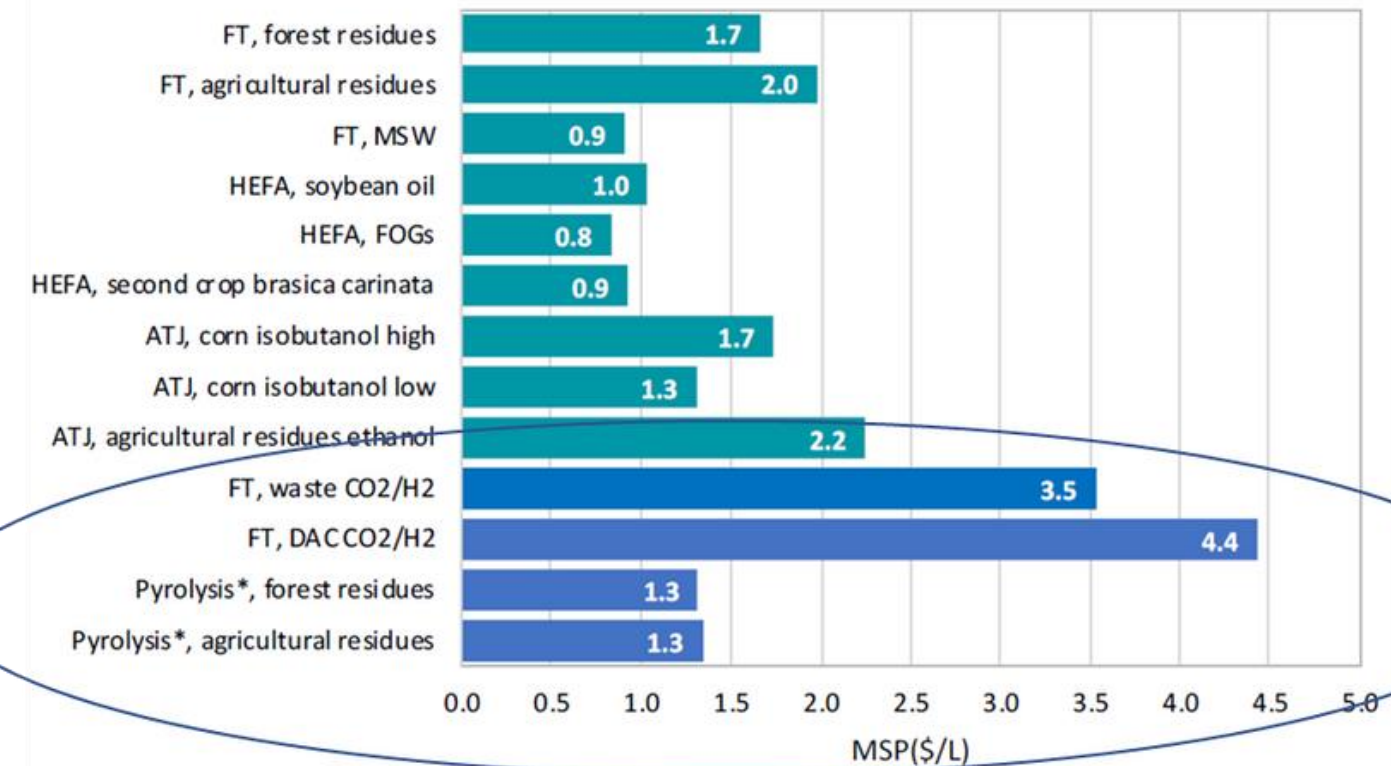
The Rules of Thumb also provide **key information for first assessment of SAF policy options.**

2023 Updates – inclusion of new pathways

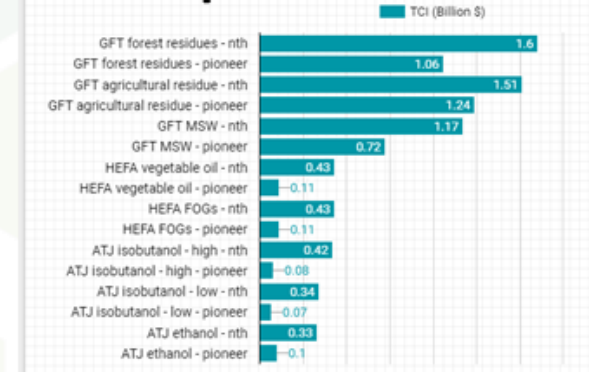
- Pyrolysis with forest residues or agricultural residues
- FT with CO₂ and H₂ as major inputs (Power to Liquids – PtL)



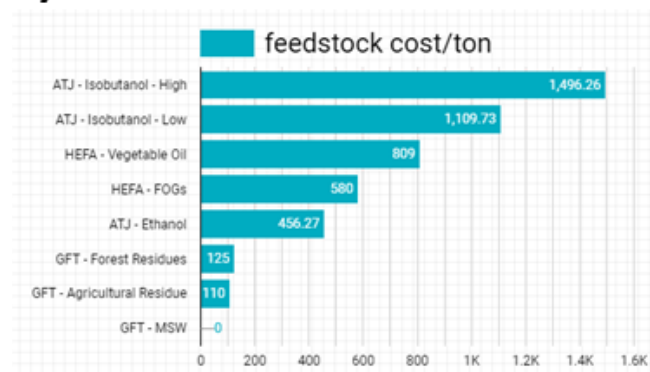
Minimum Selling Price



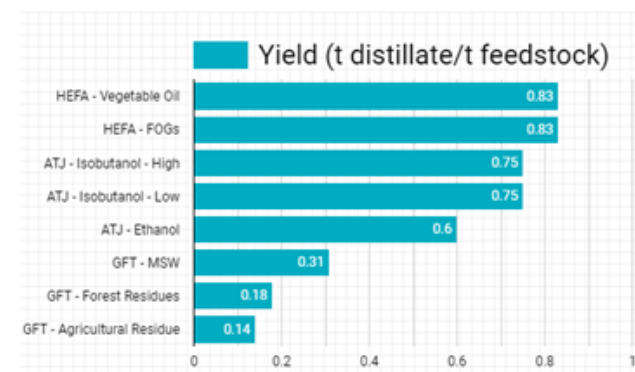
total capital investment (TCI)



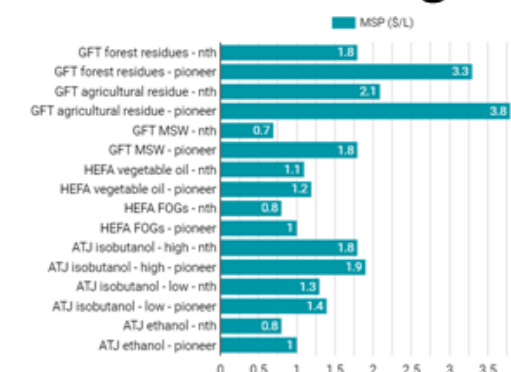
Feedstock costs



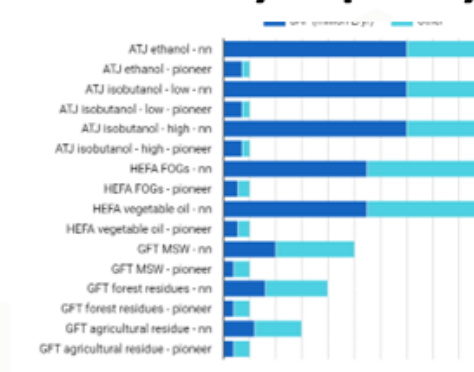
Feedstock Yield



Minimum Selling Price



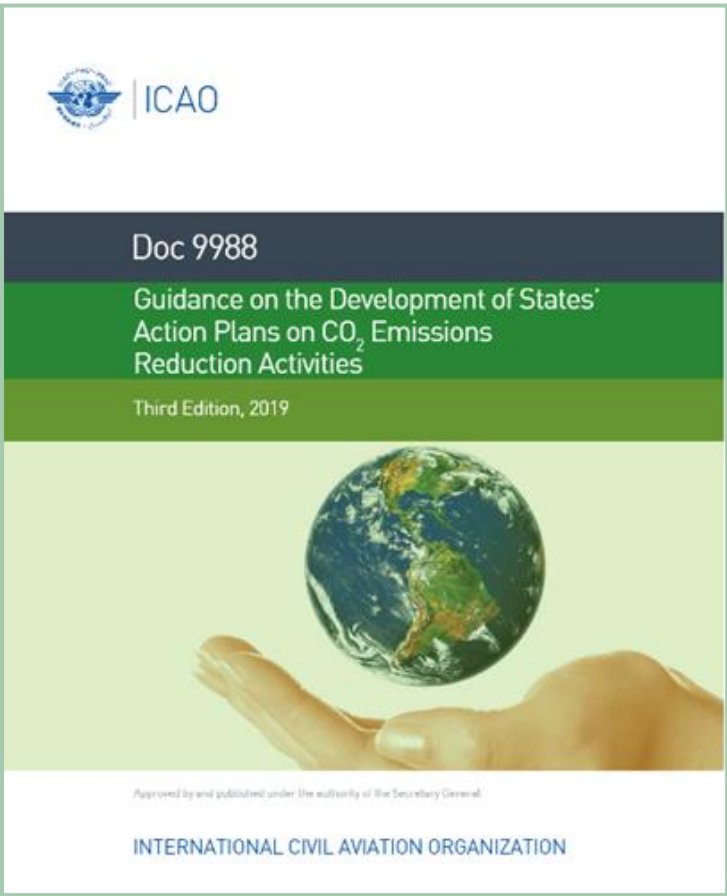
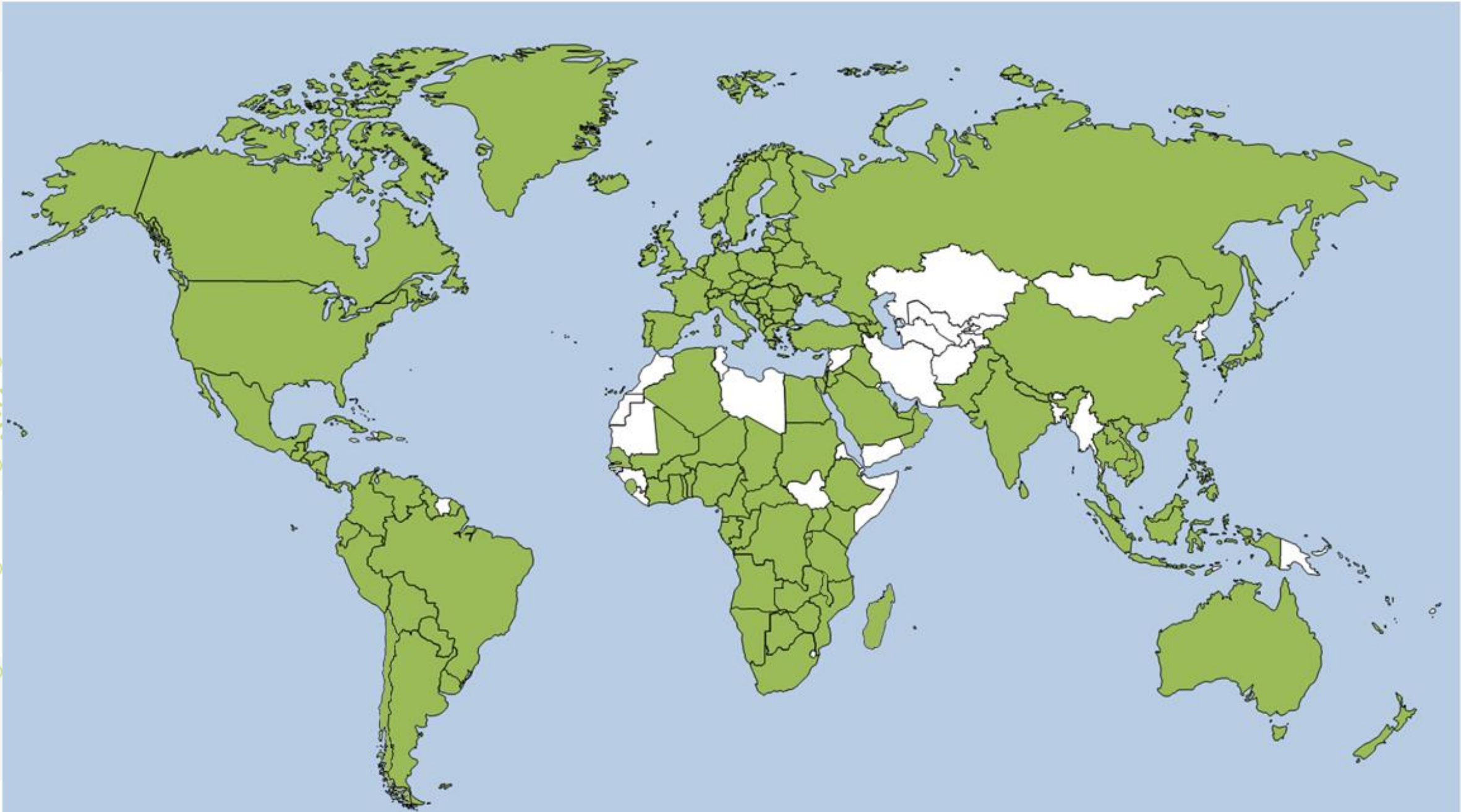
Refinery capacity



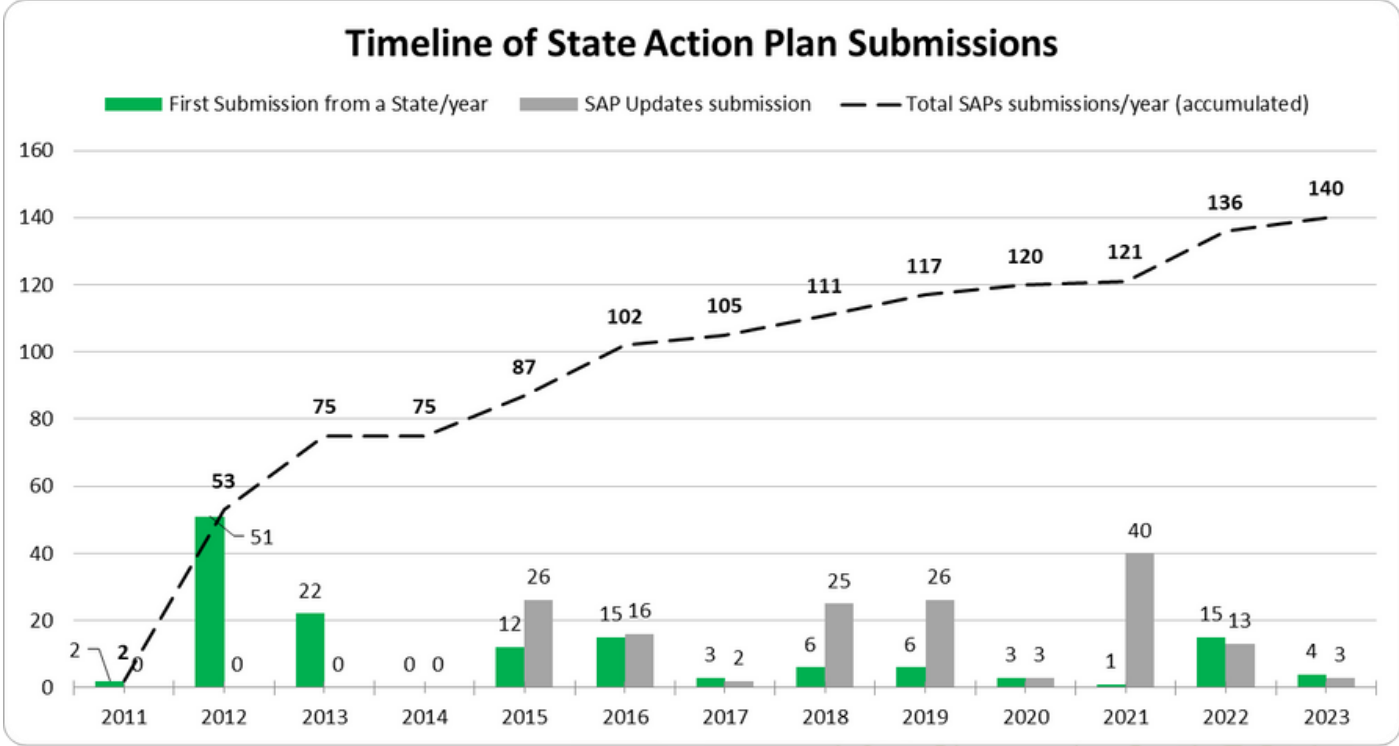
Available on the ICAO Public website - https://www.icao.int/environmental-protection/Pages/SAF_RULESOFTHUMB.aspx



Material provided to Regional Seminars on State Action Plans (Building Block 1)

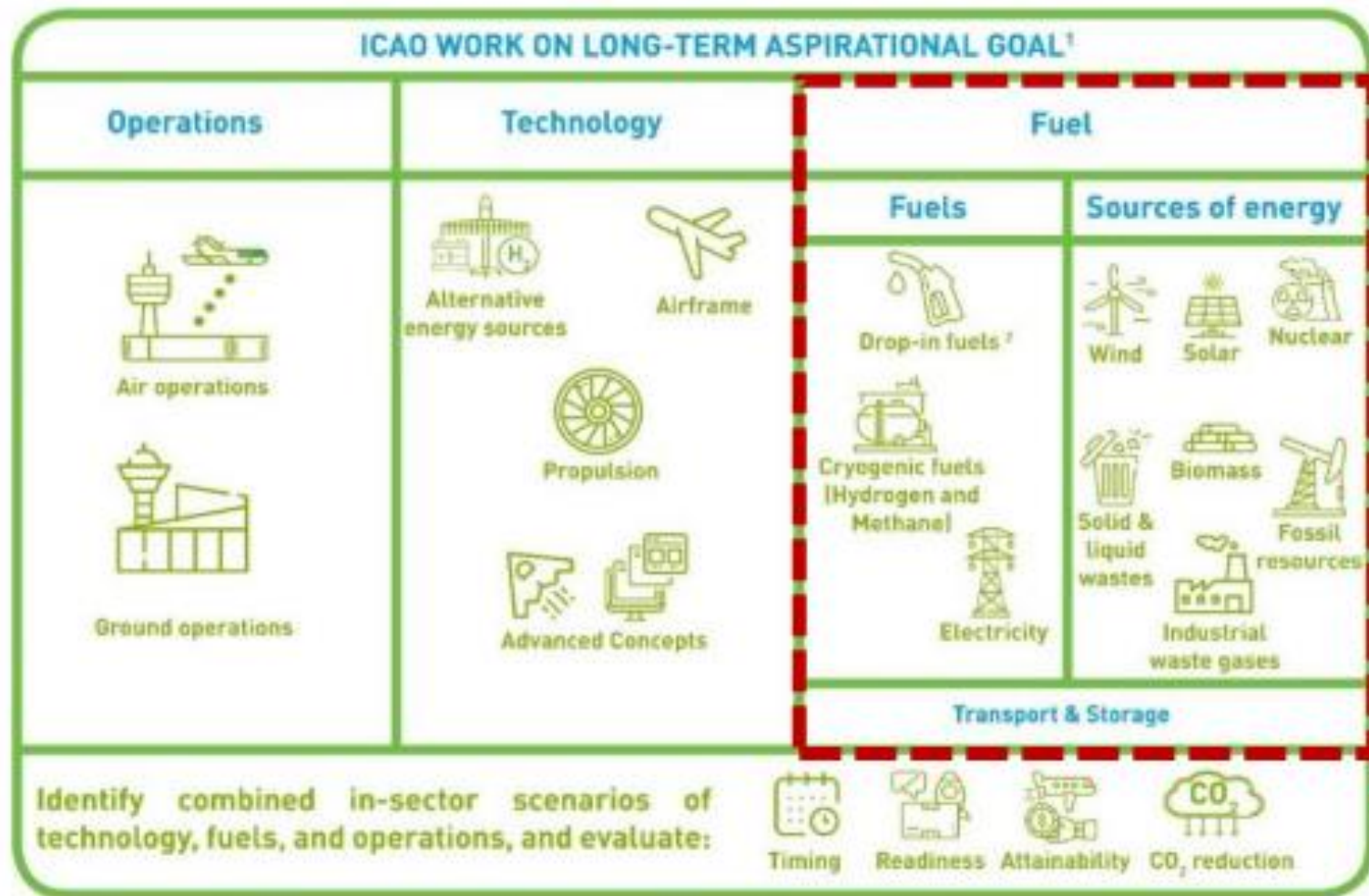


Under review!

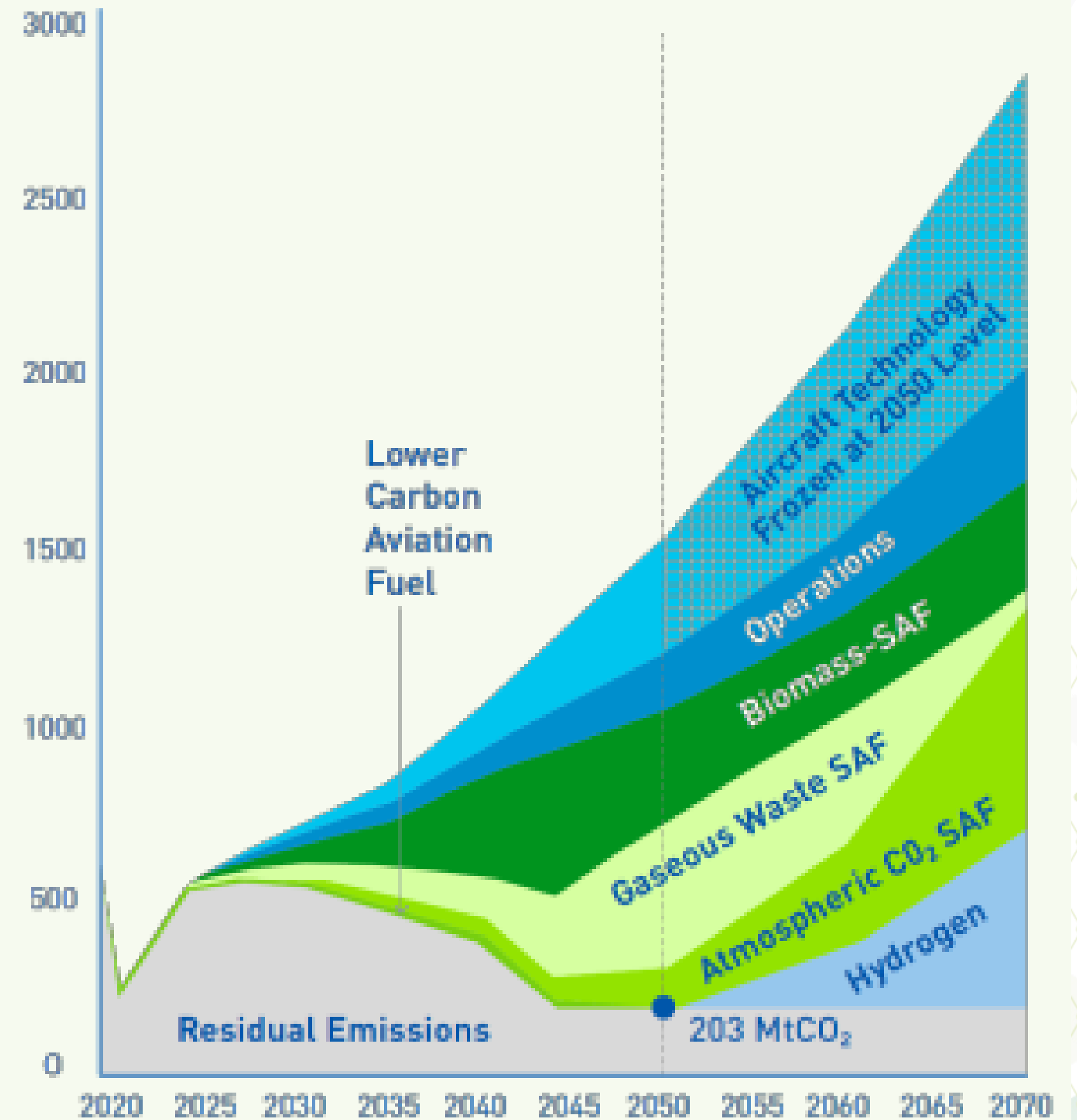




Material provided to Regional Seminars on the contribution of fuels to the LTAG (Building Block 1)



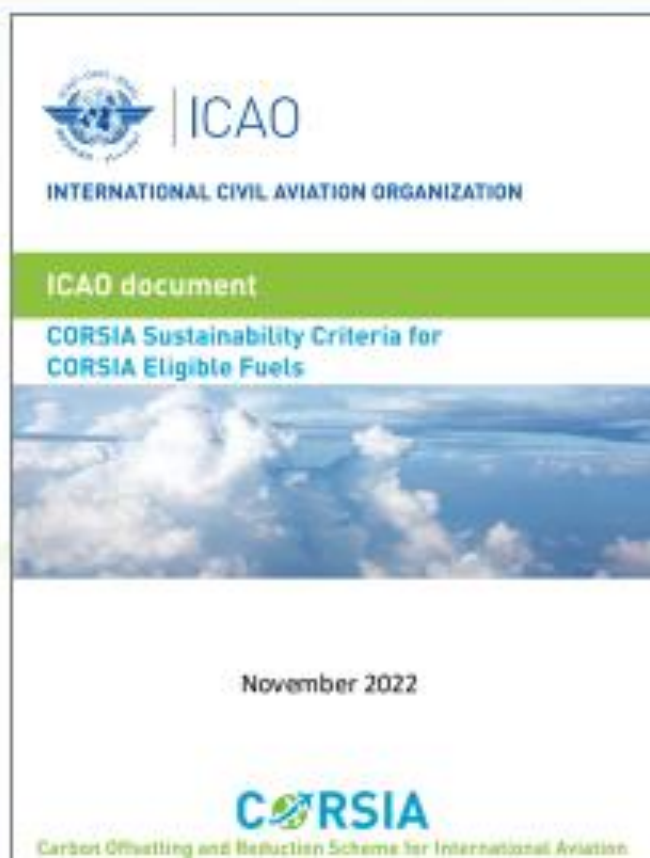
International Aviation CO₂ Emissions (MtCO₂)



Material provided to
Regional Seminars on the
Regulatory framework
(Building Block 2)

CORSIA

Carbon Offsetting and Reduction Scheme for International Aviation



**For the first time,
sustainable aviation
fuels (SAF) have been
certified under the
CORSIA**

**RECOGNITION
OF ACCOMPLISHMENT**



SCAN ME







Material provided to Regional Seminars on the Regulatory framework (Building Block 2)



CORSIA | *CO₂ Estimation & Reporting Tool (CERT)*

Version 2022



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO document

**CORSIA Central Registry (CCR):
Information and Data for Transparency**



Part I: List of Verification Bodies Accredited in States

December 2022



Carbon Offsetting and Reduction Scheme for International Aviation



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO document

**CORSIA Central Registry (CCR):
Information and Data for Transparency**



Part II: Total CO₂ Emissions for 2019 Aggregated for all Aeroplane Operators on each State Pair

October 2022



Carbon Offsetting and Reduction Scheme for International Aviation



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO document

**CORSIA Central Registry (CCR):
Information and Data for Transparency**



Part III: Total Annual CO₂ Emissions and Information for Aeroplane Operators

October 2022



Carbon Offsetting and Reduction Scheme for International Aviation



Material provided to Regional Seminars on the Regulatory framework (Building Block 2)



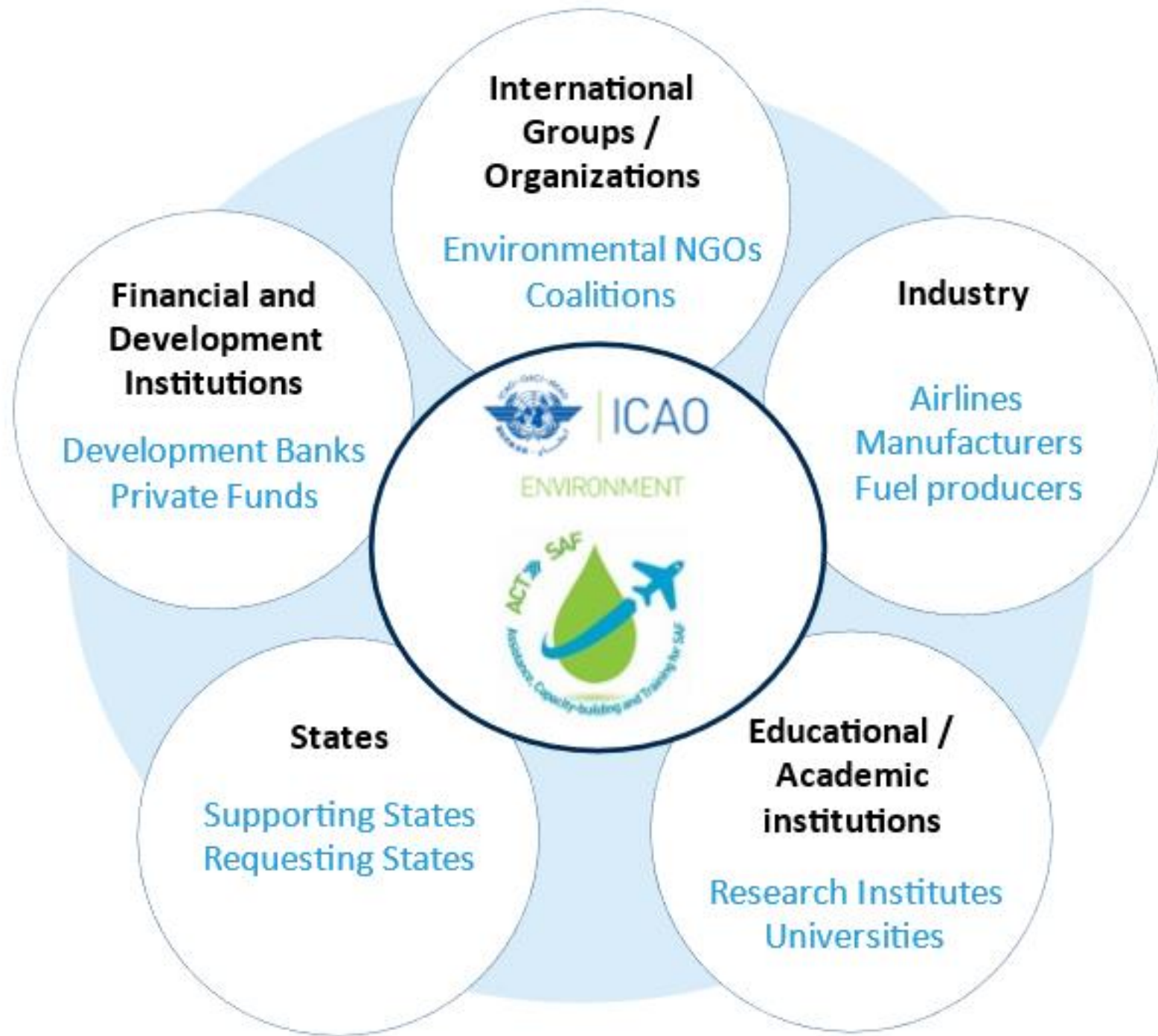
Global Framework for Aviation Alternative Fuels

SAF Tracking tools (click for details)





Material provided to Regional Seminars on implementation support (Building Block 3)



87

States

Name of State

Albania
Argentina
Australia
Austria
Bahamas
Barbados

46

Organizations

Name of Organization

WORLD TRAVEL & TOURISM COUNCIL
World Bank
WEF - World Economic Forum
Verifavia
T'way Airways
TEXAS/SEQUENCE

ACT-SAF

States

Acceptance to ... Pending Yes



International Organizations

Acceptance T&C (Blank) Pending Yes





ICAO ACT-SAF Platform

ACT-SAF Feasibility Studies Template and Guide

Feasibility Studies and other projects and activities under development

For any questions or assistance, please contact the ICAO Secretariat by email (officeenv@icao.int) indicating "ACT-SAF FS template" in the subject of the email message.





Material provided to Regional Seminars on financing cleaner energy (Building Block 4)

LTAG Report - Financing costs and investments across stakeholders

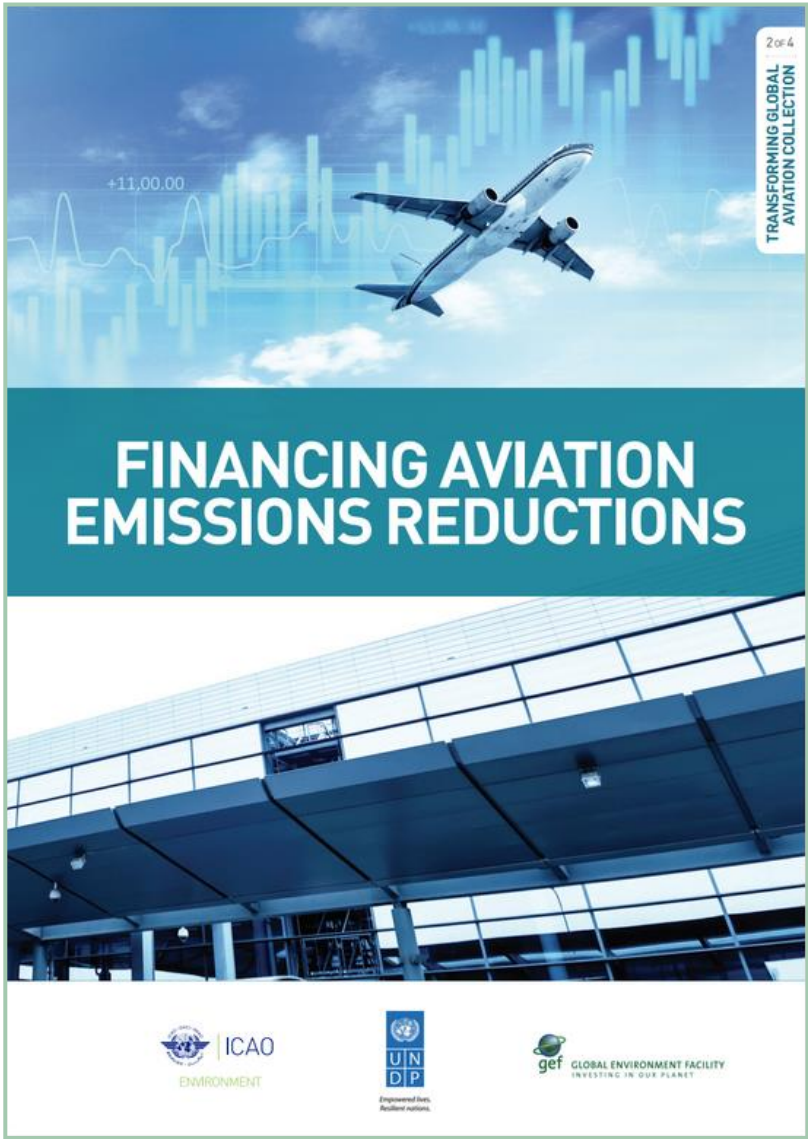
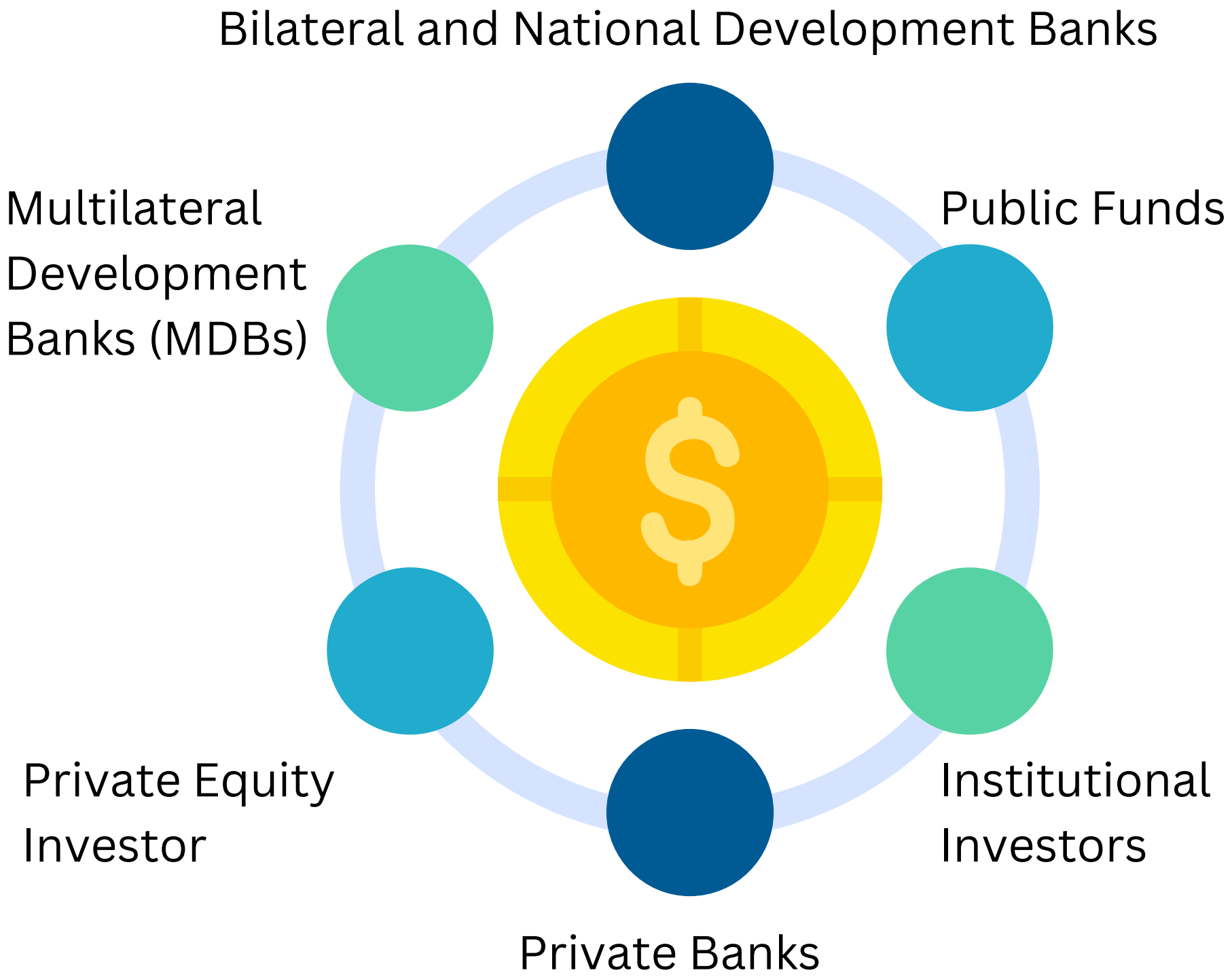
Projected cumulative (2020-2050) costs and investments associated with highest-ambition LTAG scenario, across each stakeholder group:

Stakeholders	Integrated Scenario 3
States	\$160b
Air Navigation Service Providers	\$20b
Aircraft manufacturers	\$350b
Fuel suppliers	\$3,200b
Airports	\$125b

Note: Some investments from upstream stakeholders are passed on downstream (e.g. airline operators) in the form of incremental price of products

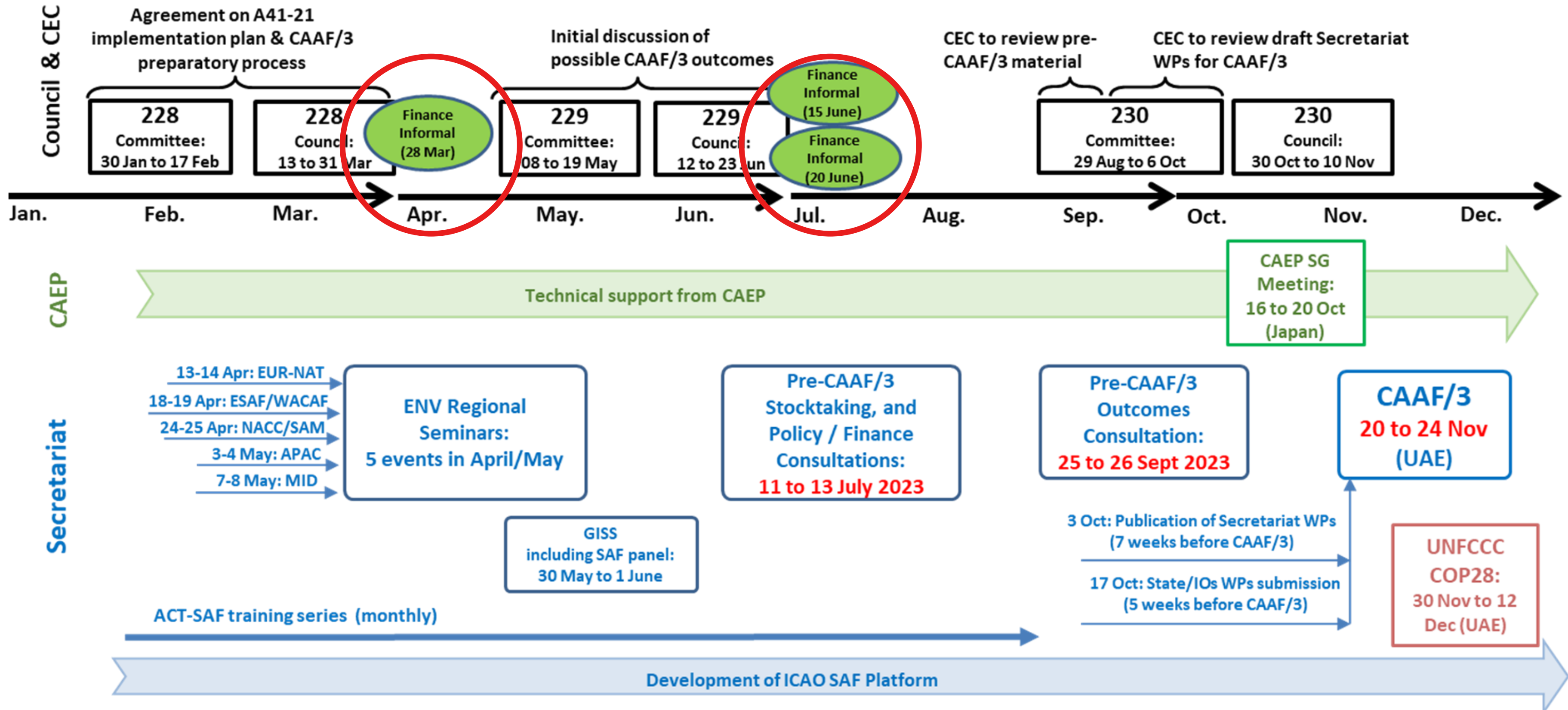


Diverse sources of financing



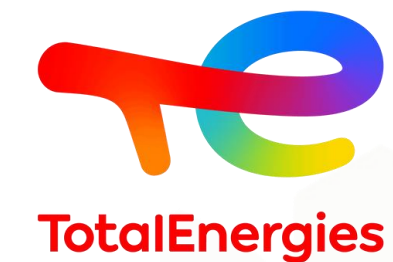


2023 timeline toward CAAF/3



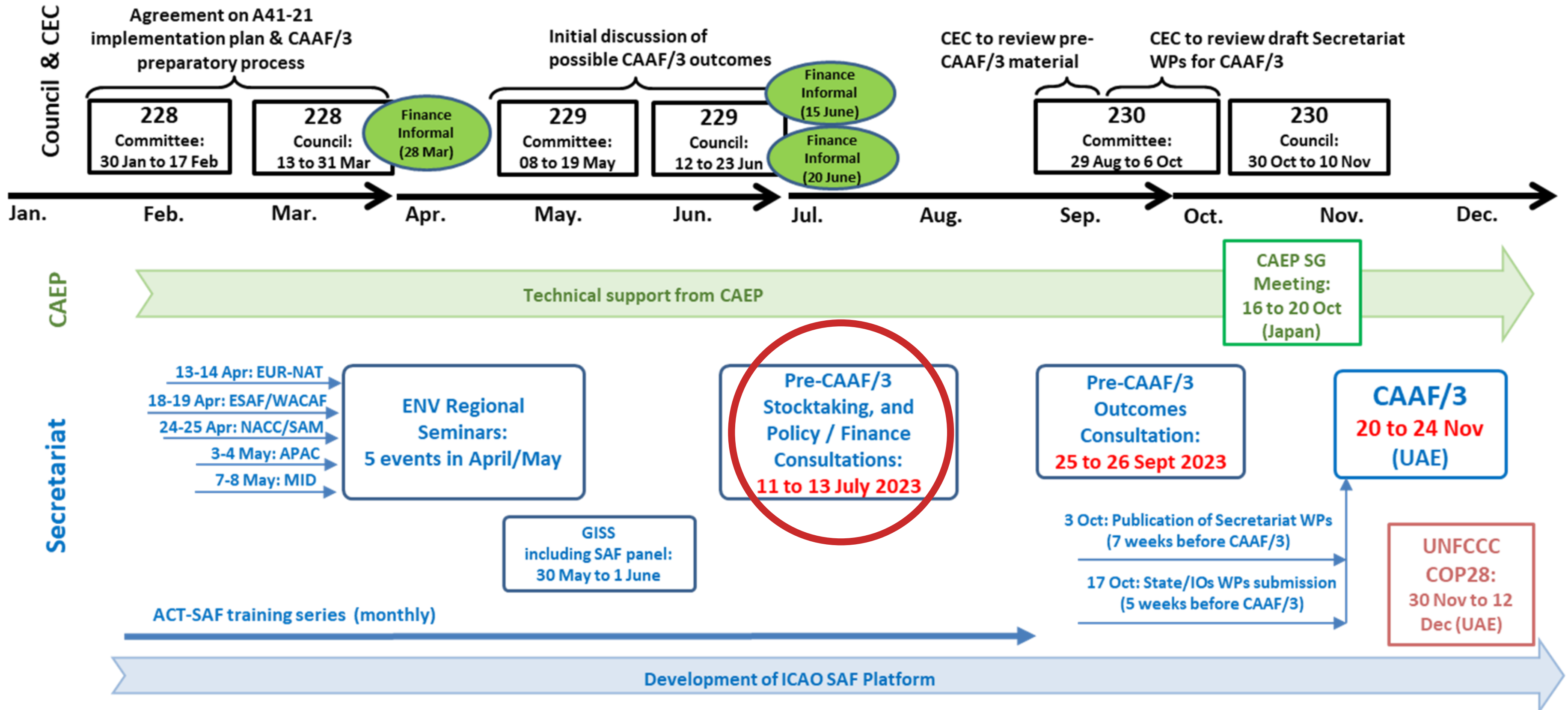


Council dialogues with the financing sector and energy providers (March – June 2023)





2023 timeline toward CAAF/3





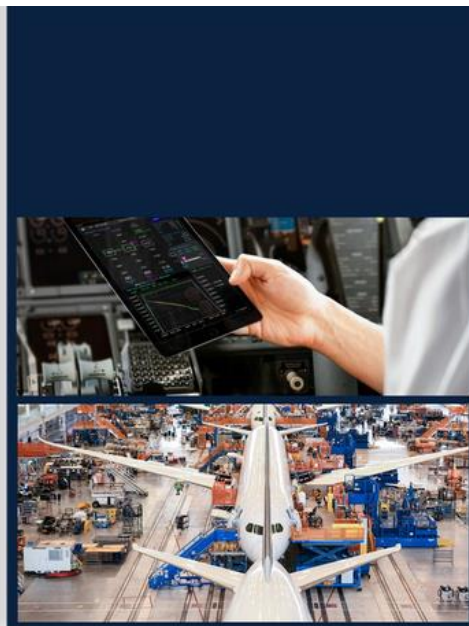
- Airports delivering SAF
- Announced SAF facilities
- Conversion processes certified for aviation
- ACT-SAF partners
- SAF policies adopted or under development

2022 Stocktaking



2023 Stocktaking

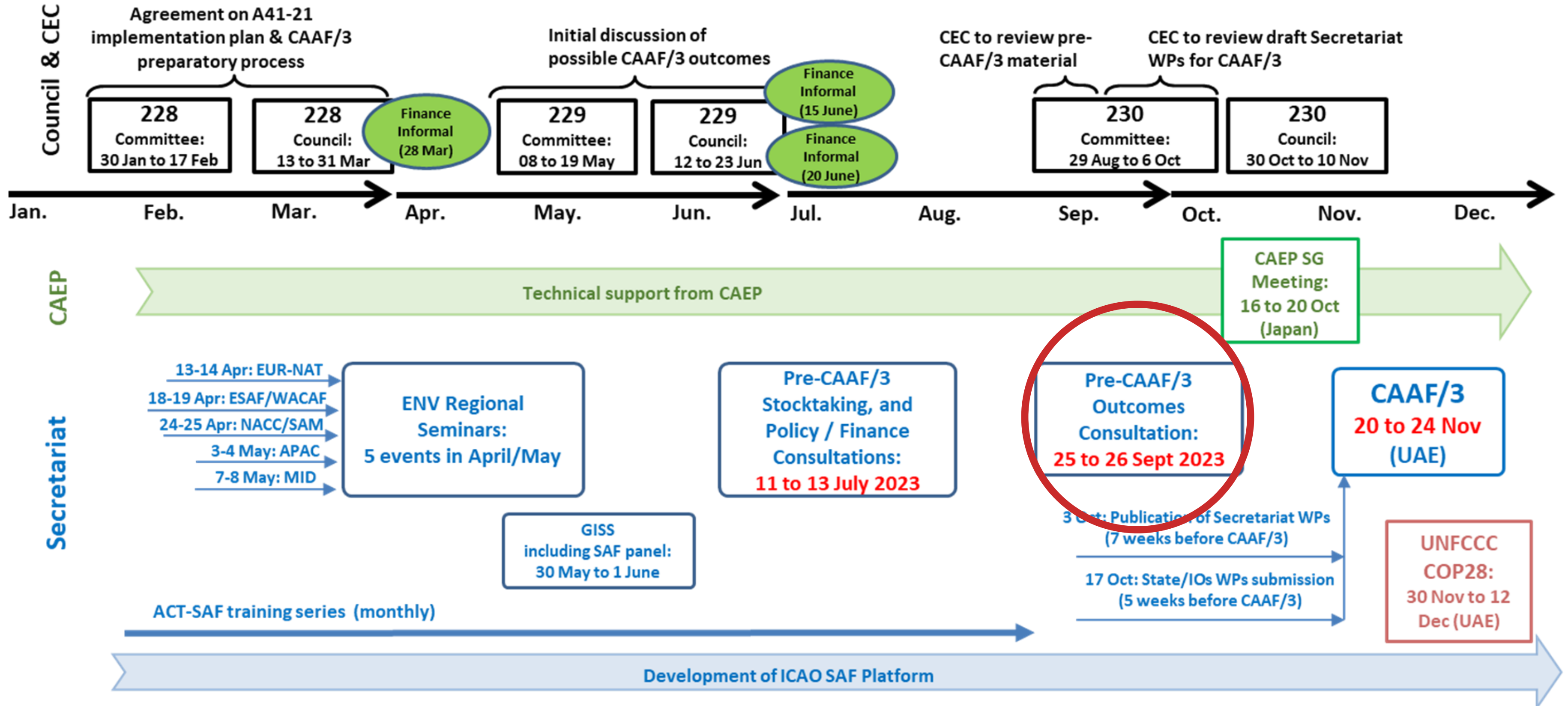








2023 timeline toward CAAF/3



Special Environment Report



ICAO



CAAF/3



2023





ICAO

Hosted by



CAAF/3

THIRD ICAO CONFERENCE ON AVIATION AND ALTERNATIVE FUELS

20 - 24 NOVEMBER 2023 | DUBAI

COMING

SOON





Boarding time
towards Net Zero
is now.