European Alternative Fuels Observatory for the aviation sector: electric aircrafts in focus

Máté Csukás, FIER Automotive

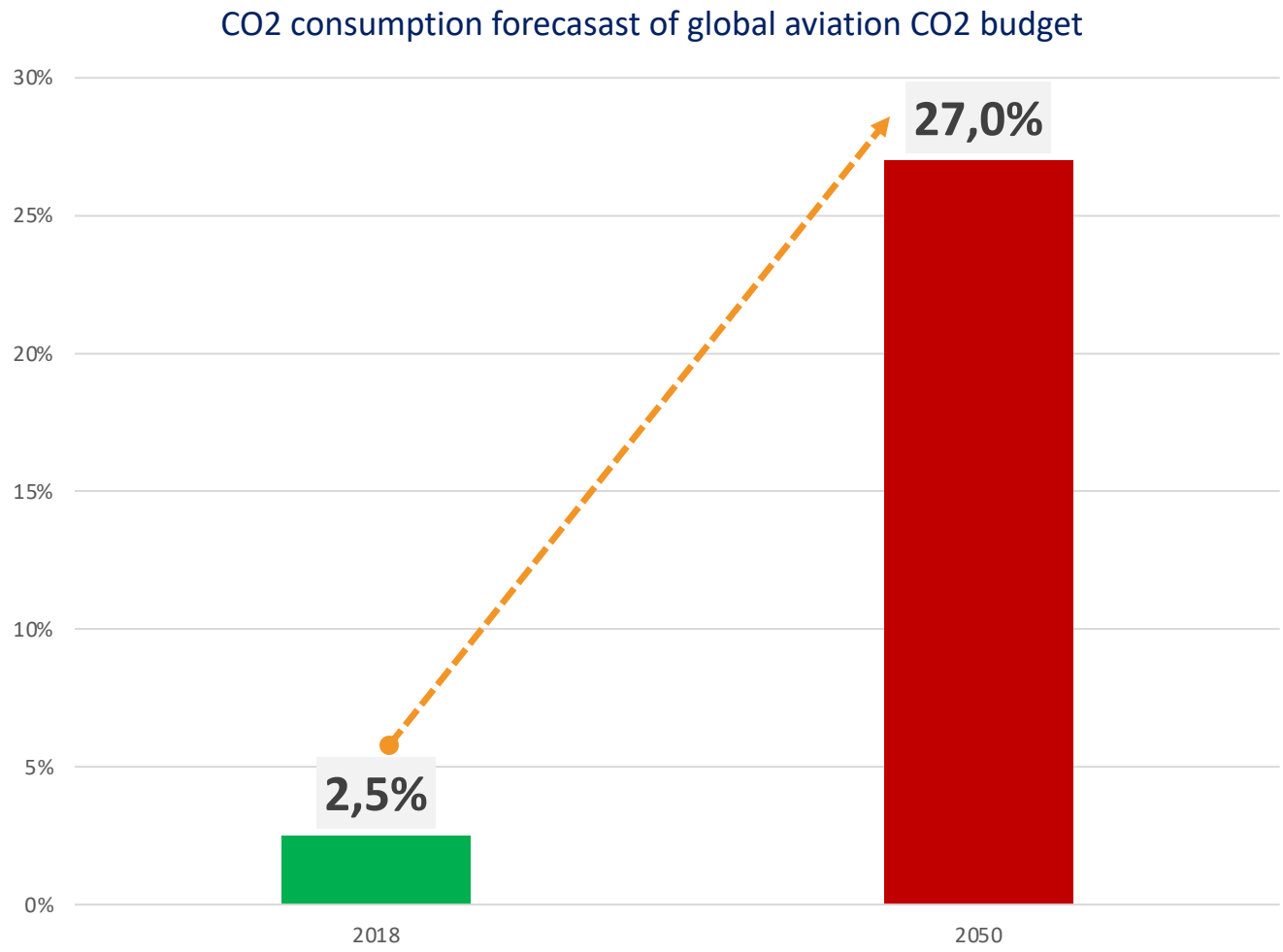
EVS35, Oslo, June 14th

Aviation emissions

European Commission | European Alternative Fuels Observatory

Key aspects

- Global CO2 budget (2.5% global, 3,8% EU) of aviation could rise to 27% with current trends
- Second largest emission after road transport in EU (13.9%)
- Even with increased fuel efficiency, air traffic growth outpaced emission savings



A FUNDAMENTAL TRANSPORT TRANSFORMATION

Multimodal approach

By 2035 in the EU

- zero-emission large aircraft should be market-ready

ReFuel EU Aviation regulation

Get Started

***Source**: Sustainable and Smart Mobility Strategy (Link)*

Introduction

The vision of EAFO 3

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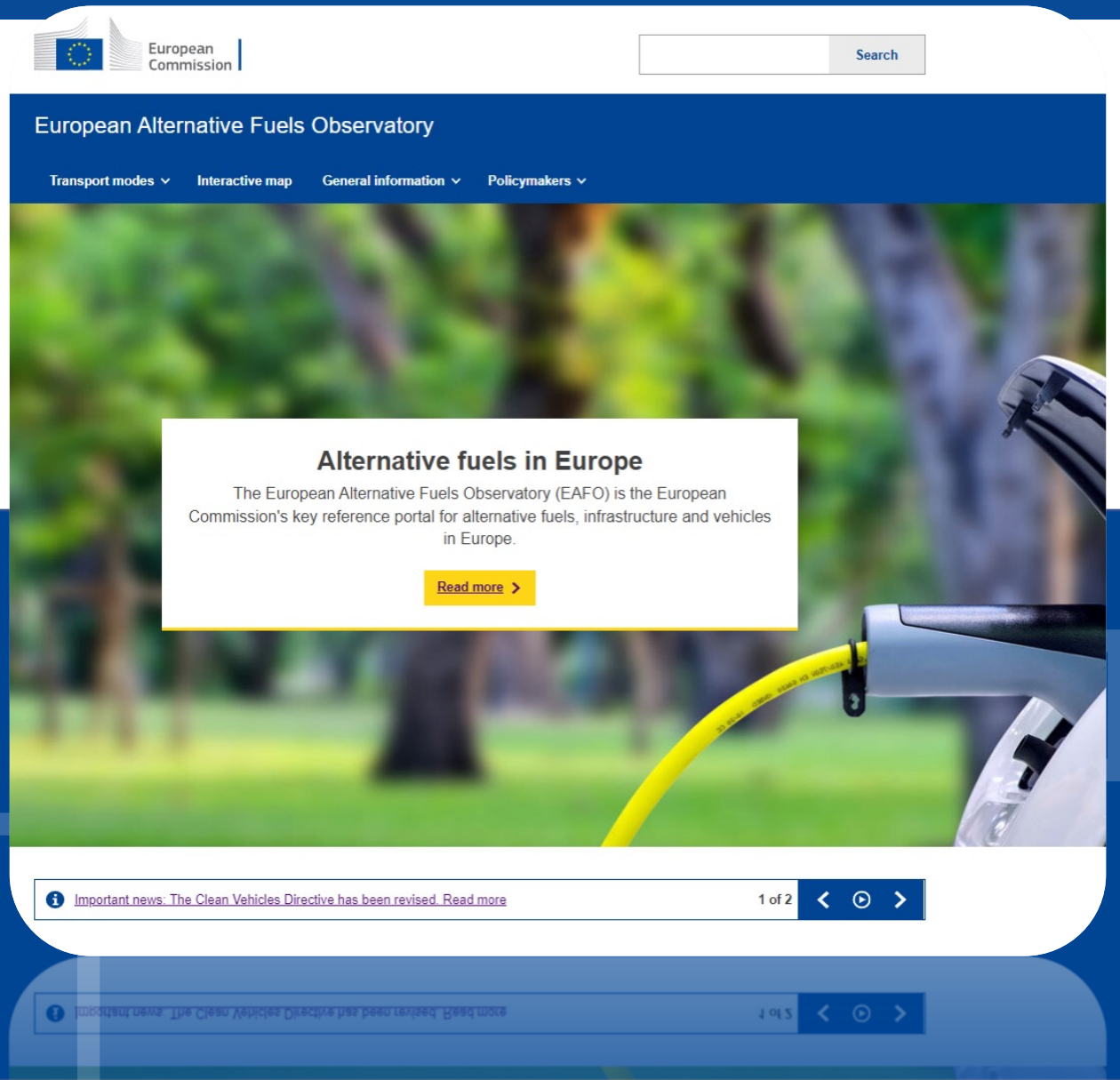
European Commission's key reference portal for alternative fuels, infrastructure and vehicles in Europe



Provide openly accessible data at the highest of quality, in an easily accessible way on Alternative Fuels in Europe to Public Authorities, Consumers and the EU.

EAFO 3 Structure

The key pillars of EAFO 3

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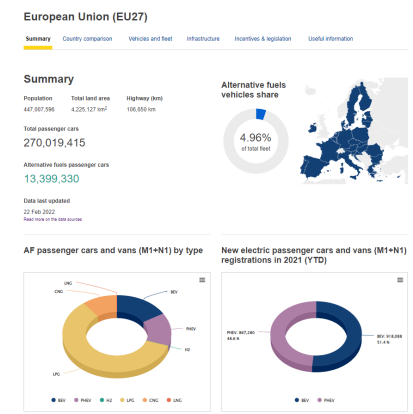
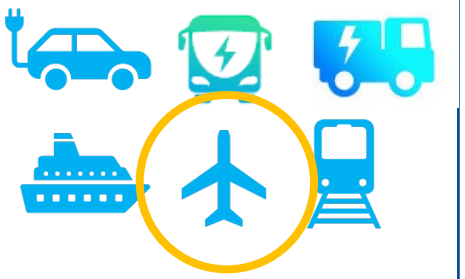
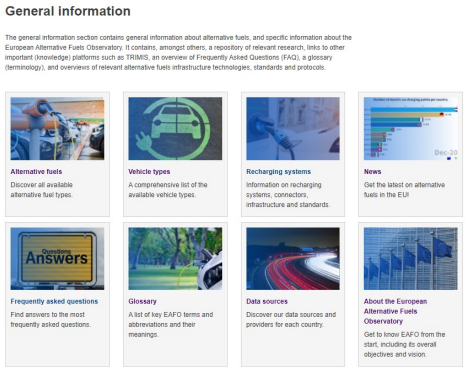
Transport Modes





Knowledge Centre

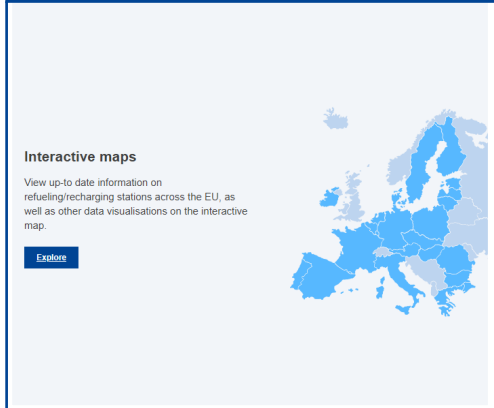


Public Authorities section

- E.g. Policies per country (Refuel Aviation, CORSIA)

Consumer information

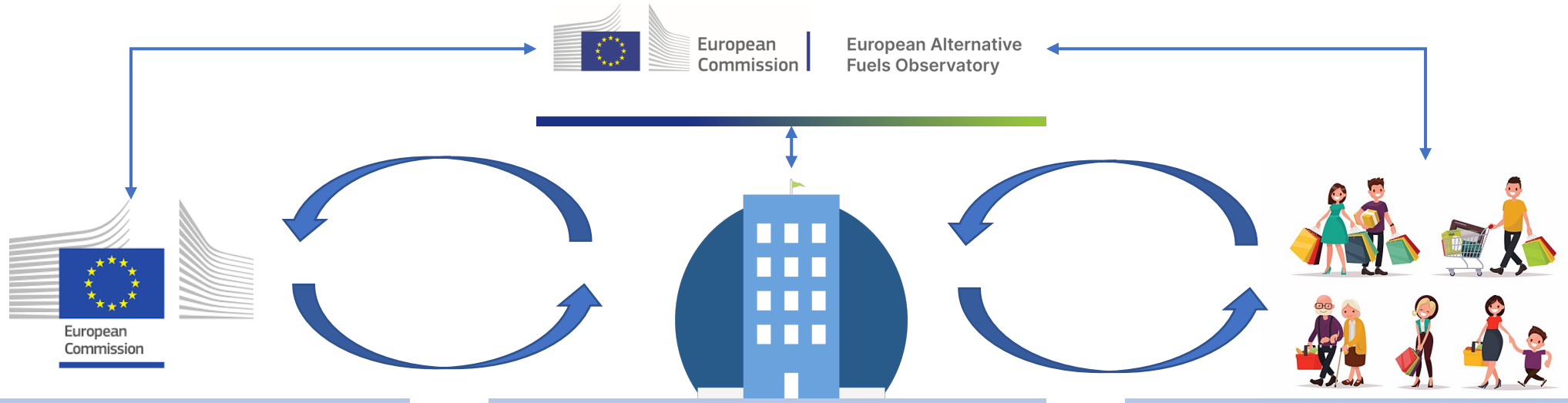
Interactive Map



- Recharging and refueling stations map (near airports)
- Interactive maps on fleet and infrastructure statistics
- Additional TENtec data layers

EAFO supporting the European uptake of EVs

How various stakeholders across Europe use EAFO?



European Commission

- Measure targets vis-a-vis targets & NPF's
- Tracking market development
- Insight in consumer attitude & perceptions
- Evaluate policy effectiveness
- Input for new policies, directives & regulations (Refuel Aviation), negotiations with MS etc.

Public Authorities

- Use for target-setting
- Benchmark results and programs
- Find tools & best practices for policy making
- Learn from others (e.g., airport decarbonization practices)

Consumers and Businesses

- Forerunner airlines in zero emission
- Pilot and demonstration projects

Decarbonisation solutions and challenges

What is realistic in the short and long term?

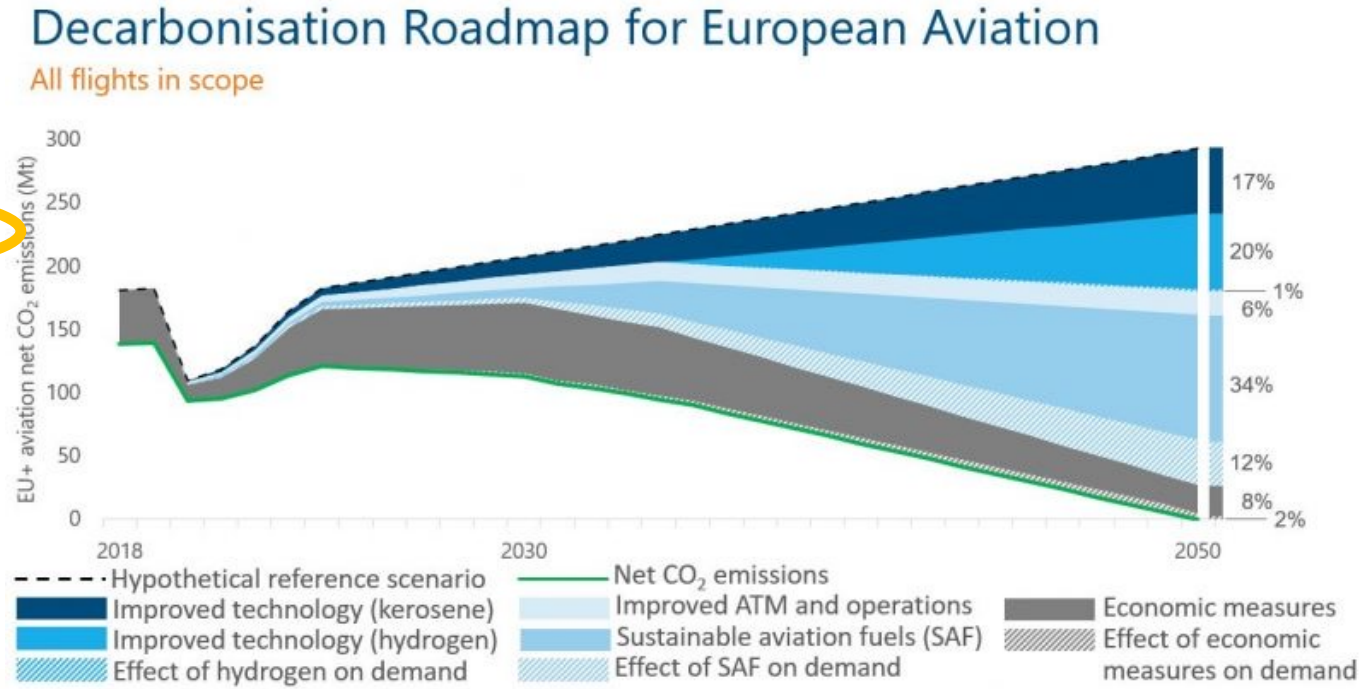
European Commission | European Alternative Fuels Observatory

Near- to medium-term

- **Sustainable aviation fuels**
- **Operational and technical improvements**
- **Airport decarbonisation**
- **Modal shifts and behavioural change**

Long-term decarbonisation solutions

- **Battery-electric propulsion**
- **Hydrogen-powered aircraft**



Source: IEA Aviation Report, Own edition (2022)

Source: Destination2050 (2022)

Aviation on the EAFO Portal

European Commission | European Alternative Fuels Observatory

Currently available

Aviation

Currently available in the EAFO Aviation section:

Upcoming data on EAFO

The scope of EAFO with regards to alternative fuels in European aviation

Alternative fuels used for aviation

Information on alternative fuels available for aviation

Alternative fuelled aircrafts

Availability or development of zero emission airplanes, including VTOL (virtual take-off and landing or "drones") for passenger taxi-like transport

Pilot projects

Pilot and demonstration projects using alternative fuels in aviation.

Electric ground support equipment

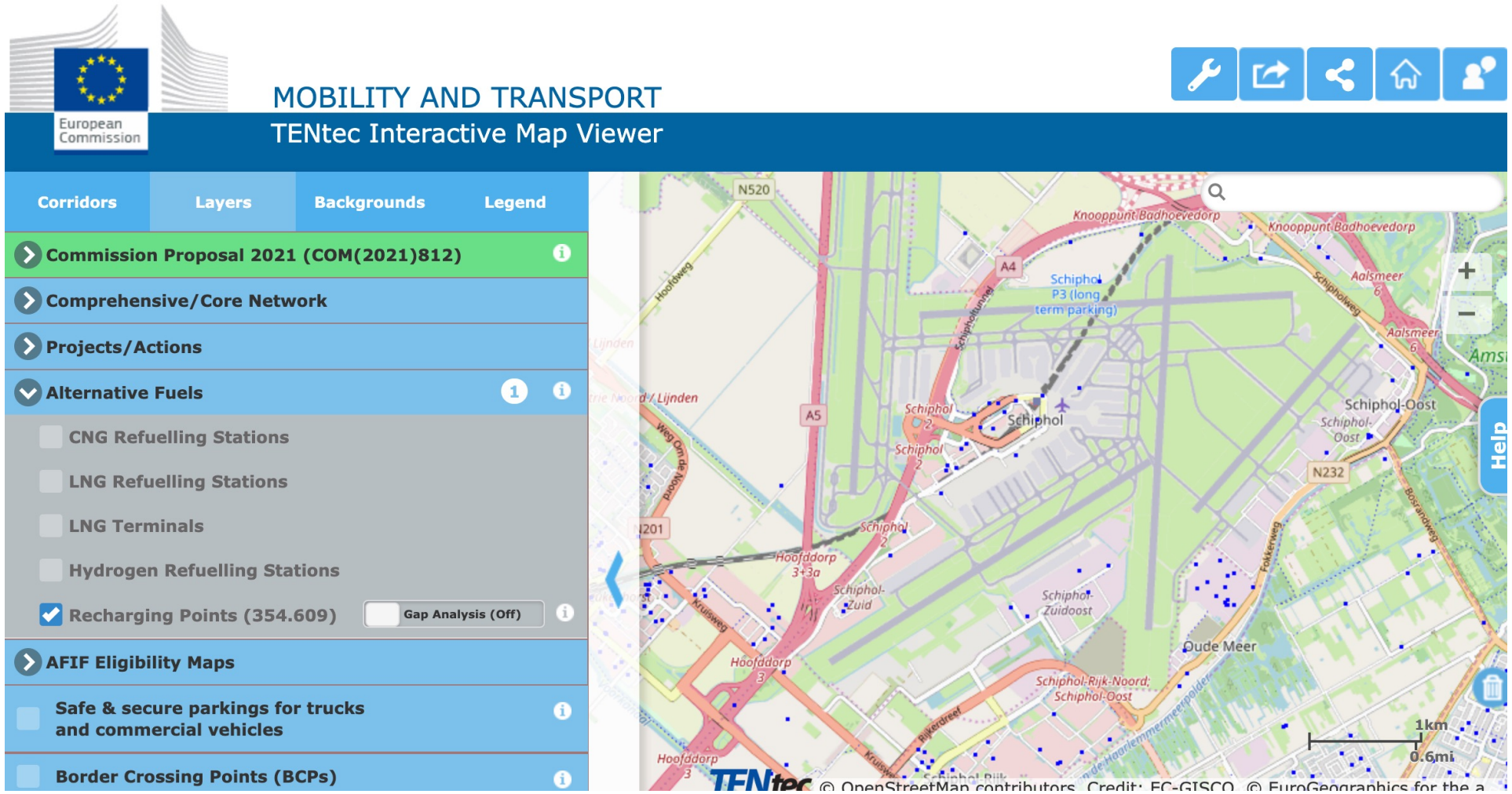
Developments on airports related to the use of AFs for ground vehicles, focusing on pilots and demonstration projects (e.g., special purpose zero emission vehicles for airport use).

In Development

- **Recharging infrastructure**
- **Electricity to stationary aircrafts**
  - Number of airports covered among the TEN-T core airports
  - Fixed or mobile applications
- **Statistics for commercial deployment**
  - Registration per countries
- **Energy production at airports**
- **Monitoring and managing environmental and energy performance of airports**

Recharging infrastructure

Available public recharging points near Amsterdam Schipol airport



Airport infrastructure readiness

National Policy Frameworks about electricity supply for stationary airplanes

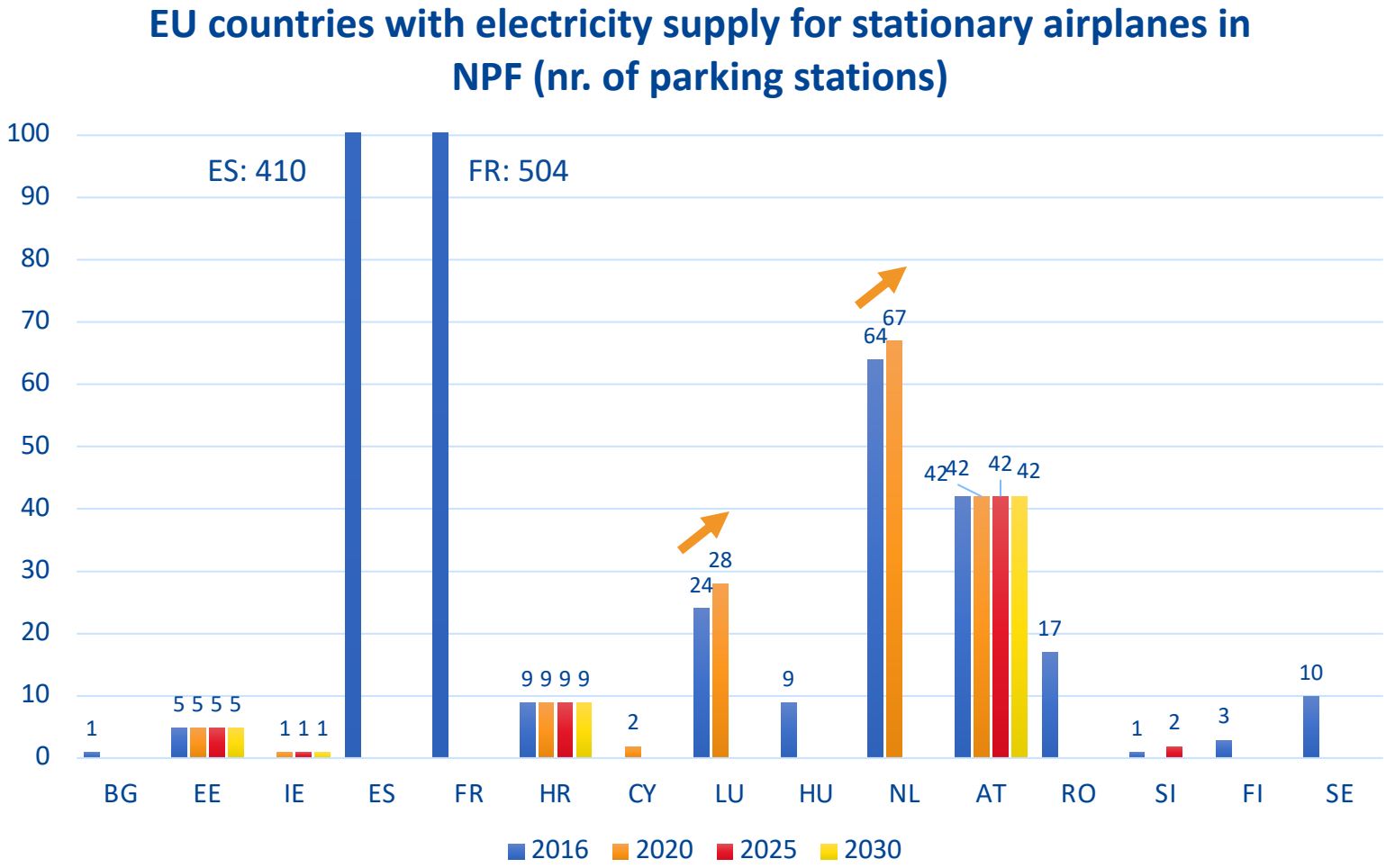
European Commission | European Alternative Fuels Observatory

EAFO objective

- novel dataset about **electricity supply infrastructure** at airport terminals for stationary planes

Observations

- 15 Member States provided targets for electricity supply to stationary aircrafts
- Spain, France, Netherlands and Austria leads in terms of targets



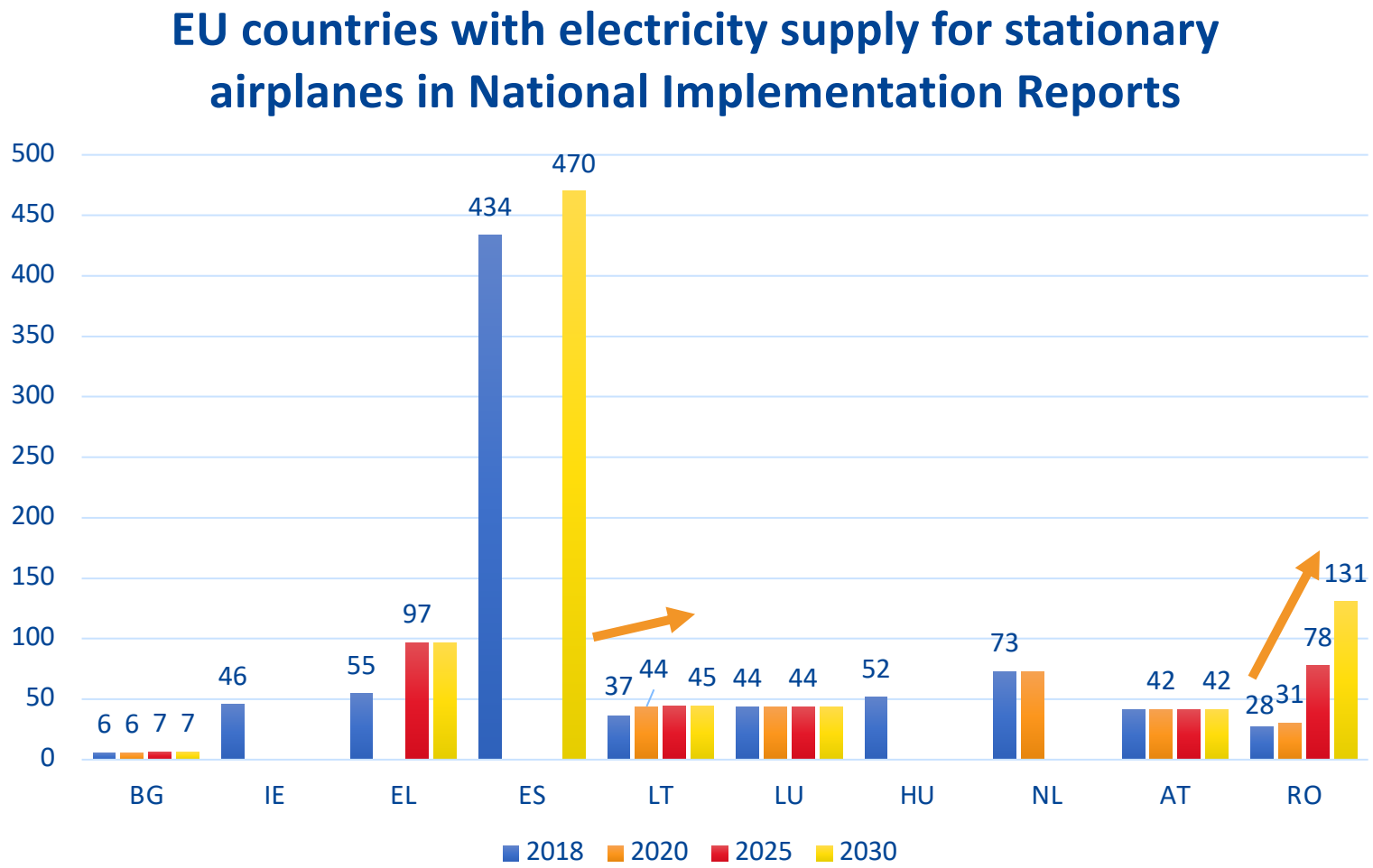
Airport infrastructure readiness

National Implementation Reports about electricity supply for stationary airplanes

European Commission | European Alternative Fuels Observatory

Observations

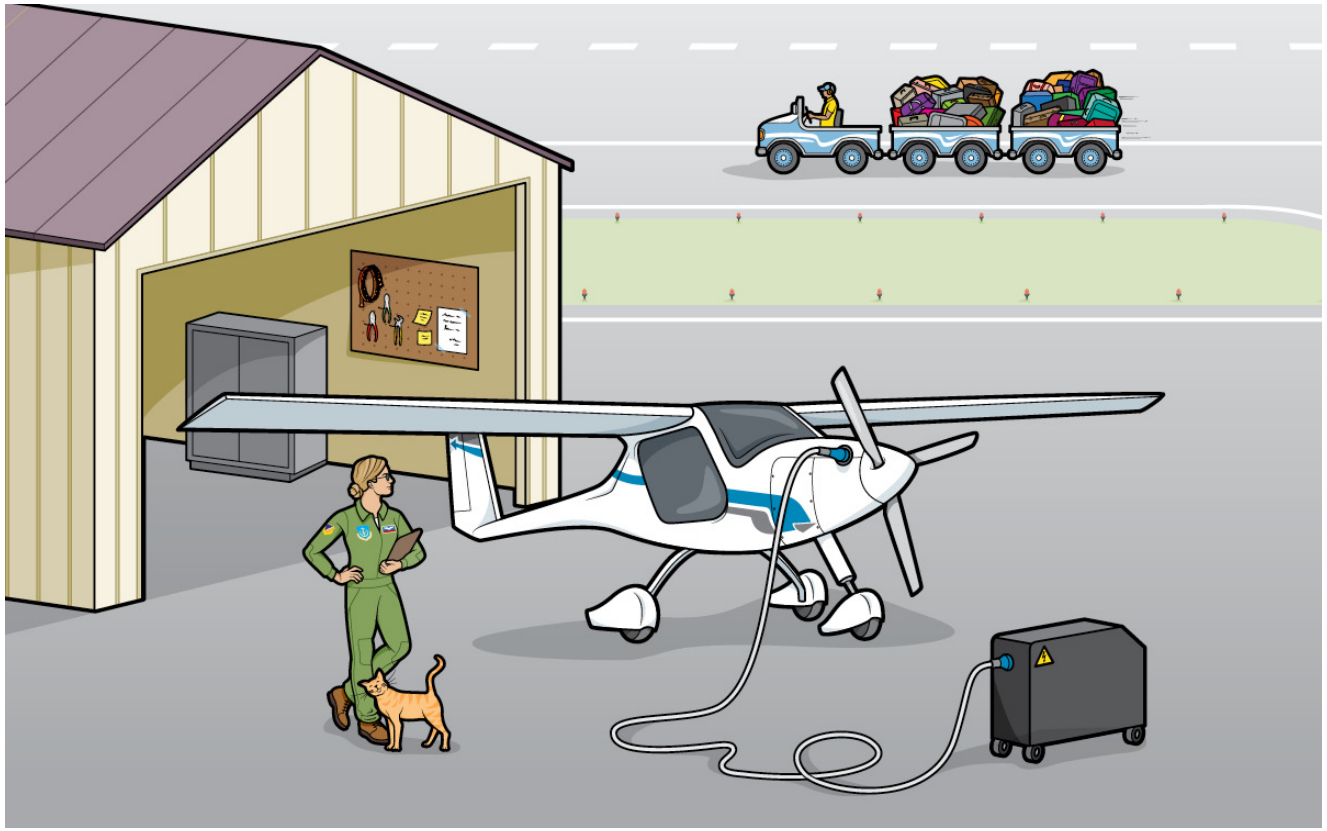
- Few countries revised their targets
- Some countries set more ambitious targets (Greece, Romania, Ireland, Hungary), some lowered ambitions (Lithuania)



Alternative fuelled aircrafts

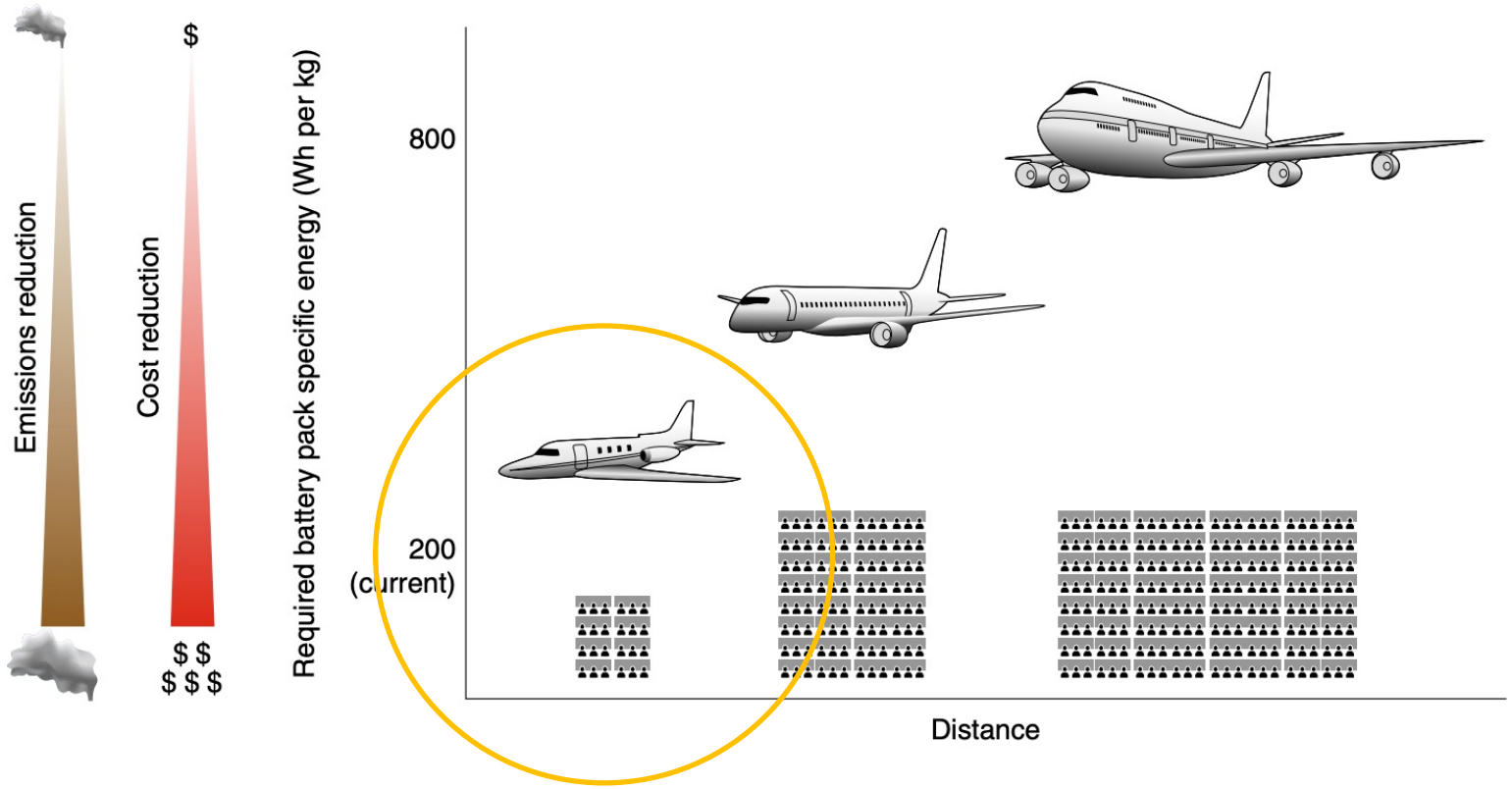
(Battery) Electric Aircrafts

- An electric aircraft is an aircraft powered by **electricity**, almost always via one or more electric motors which drive propellers
- **On-board battery** as **the** sole motive power source
- With the growing efficiency rates, Li-ion batteries became **sufficient** in **2019** for small aircrafts
- Significant breakthroughs in battery chemistry research needed for larger aircrafts



The case of aircraft electrification

Size matters

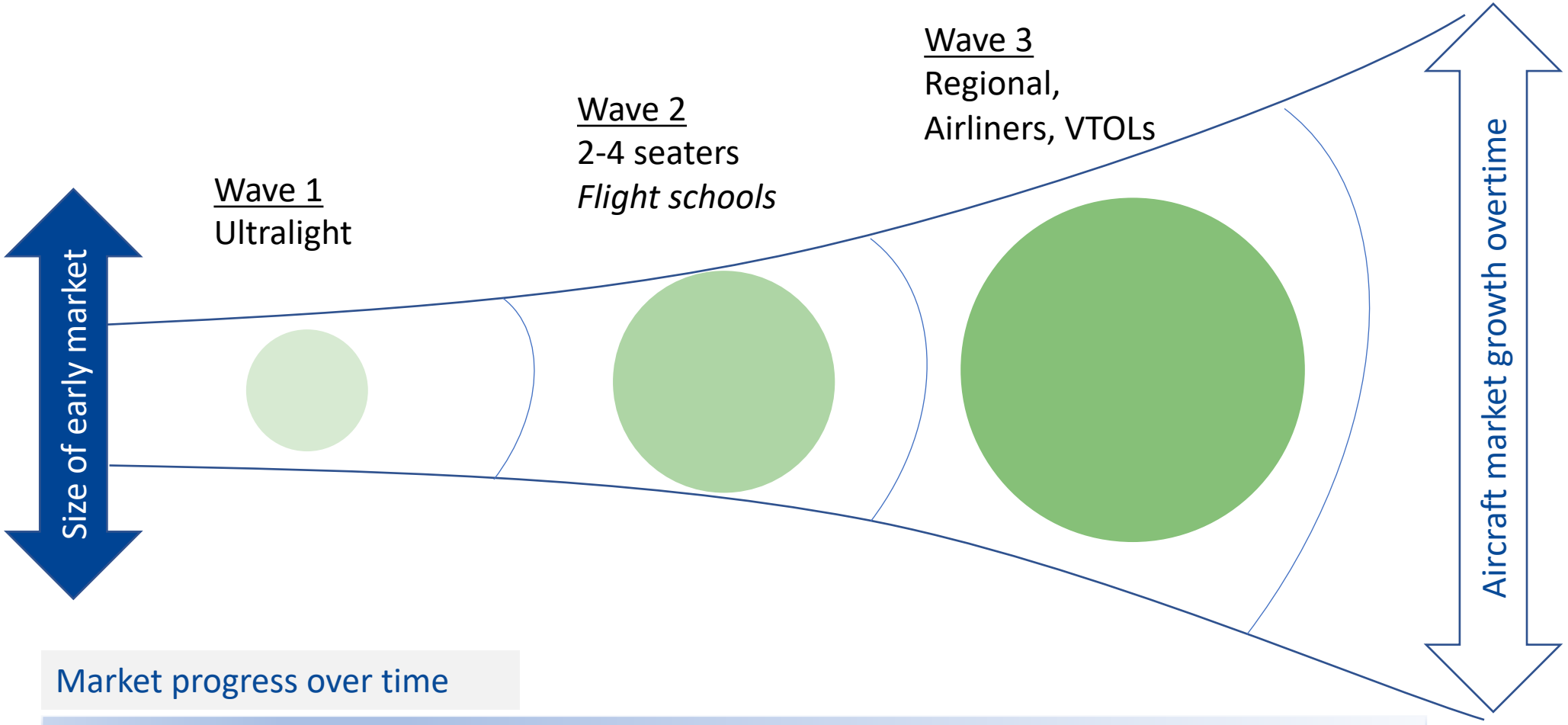


Observations

- Increasing the aircraft size, increases the battery pack necessary for a feasible design
- The smallest aircraft has the greatest benefits
- Benefits decreases with size and range

Bridgehead development strategy?

How can electric aircrafts be commercially viable



Statistics for commercial deployment

National plans

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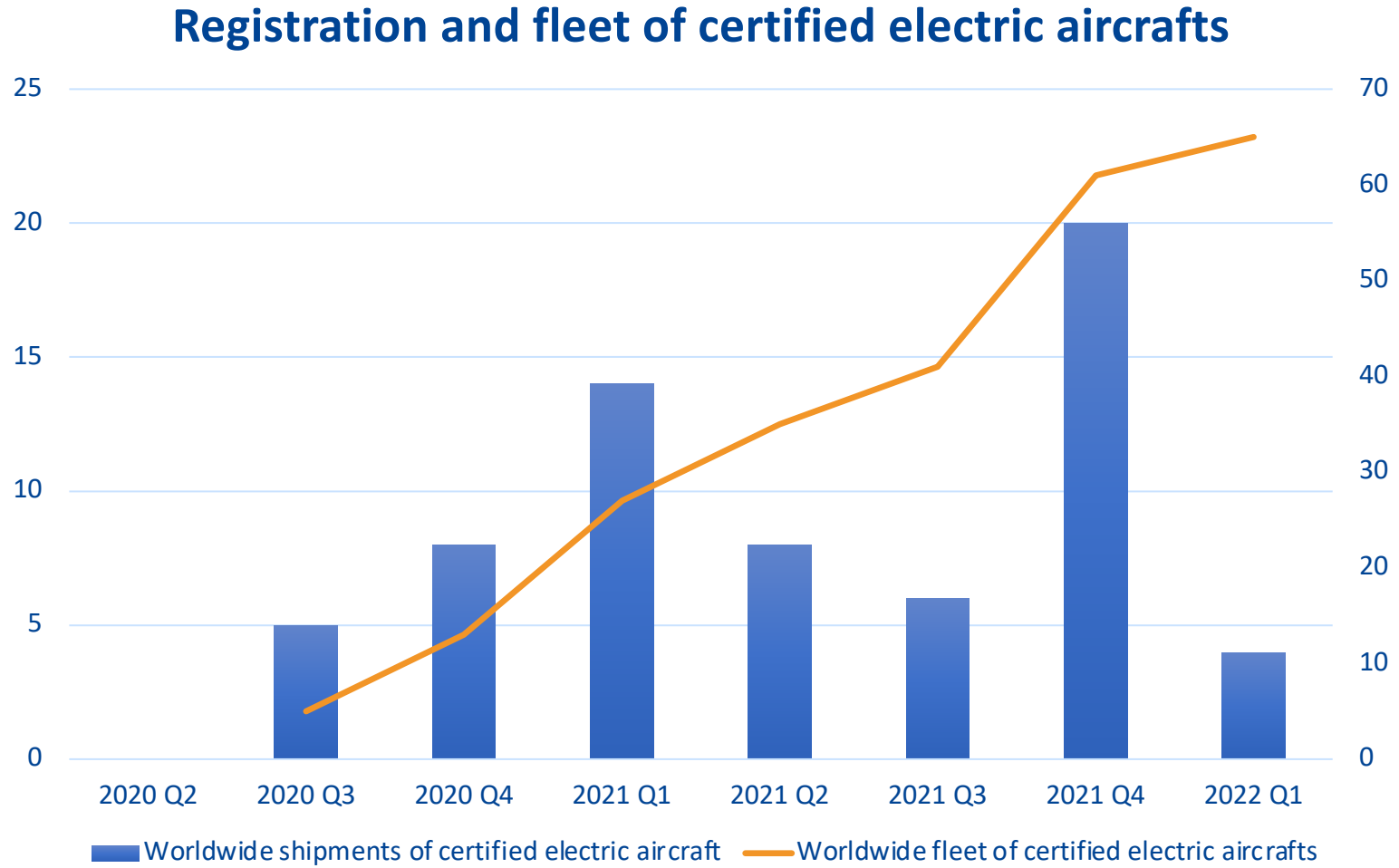
Observations

- There is currently one type certified electric aircraft
- The Pipistrel Velis Electro from Slovenia*, which is a trainer aircraft.

*In April 2022 the company was purchased by US company Textron



Source: Gama Quarterly Shipments and Billings (1), (2)

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Properties of electric aircrafts being developed

Number of models and power source

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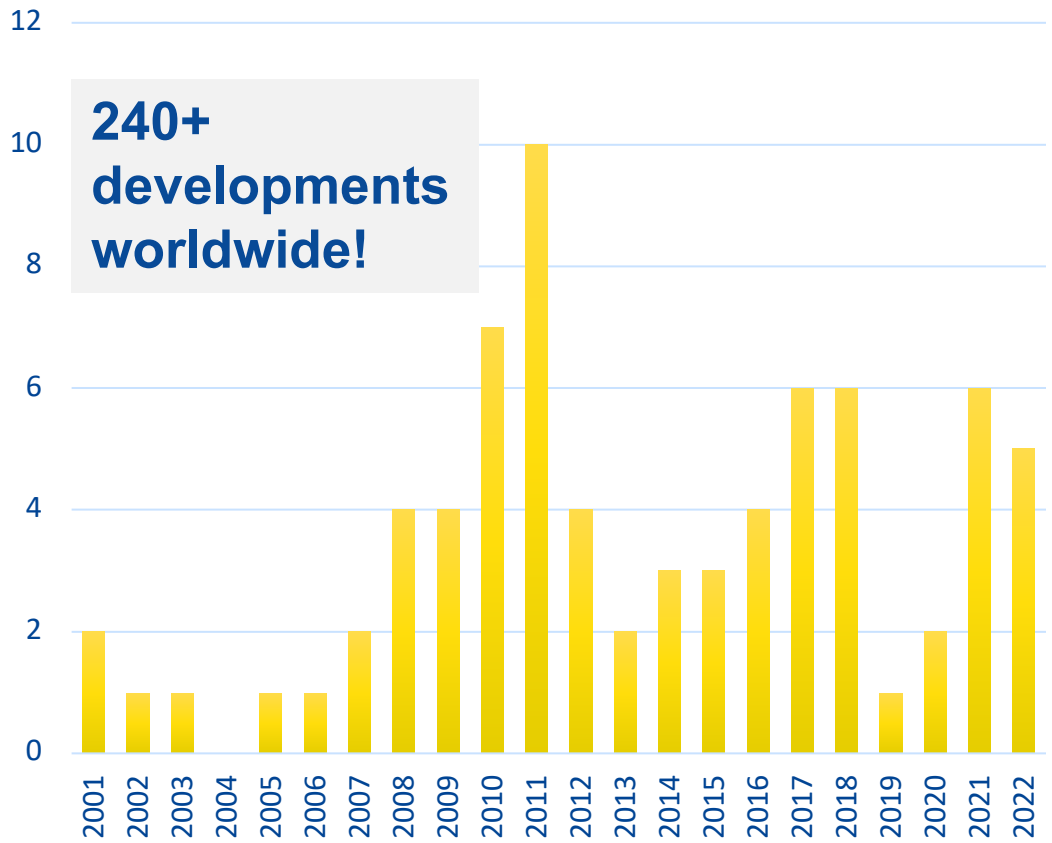
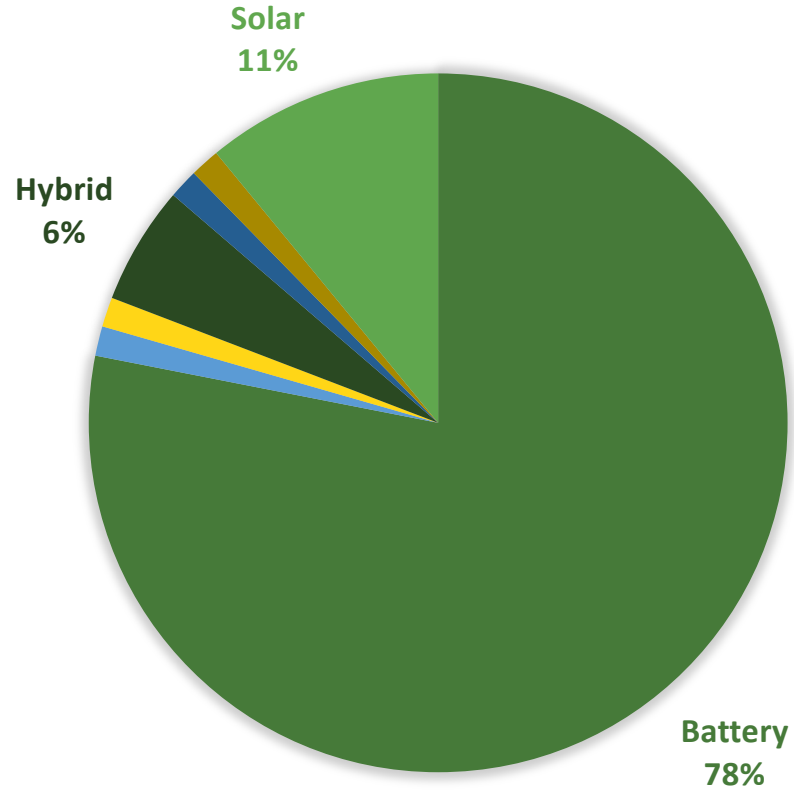
Number of aircrafts entered development (73 counted)



Number of aircrafts based on power source



Source: EAFO (2022)

Properties of electric aircrafts being developed

Number of models per country and type

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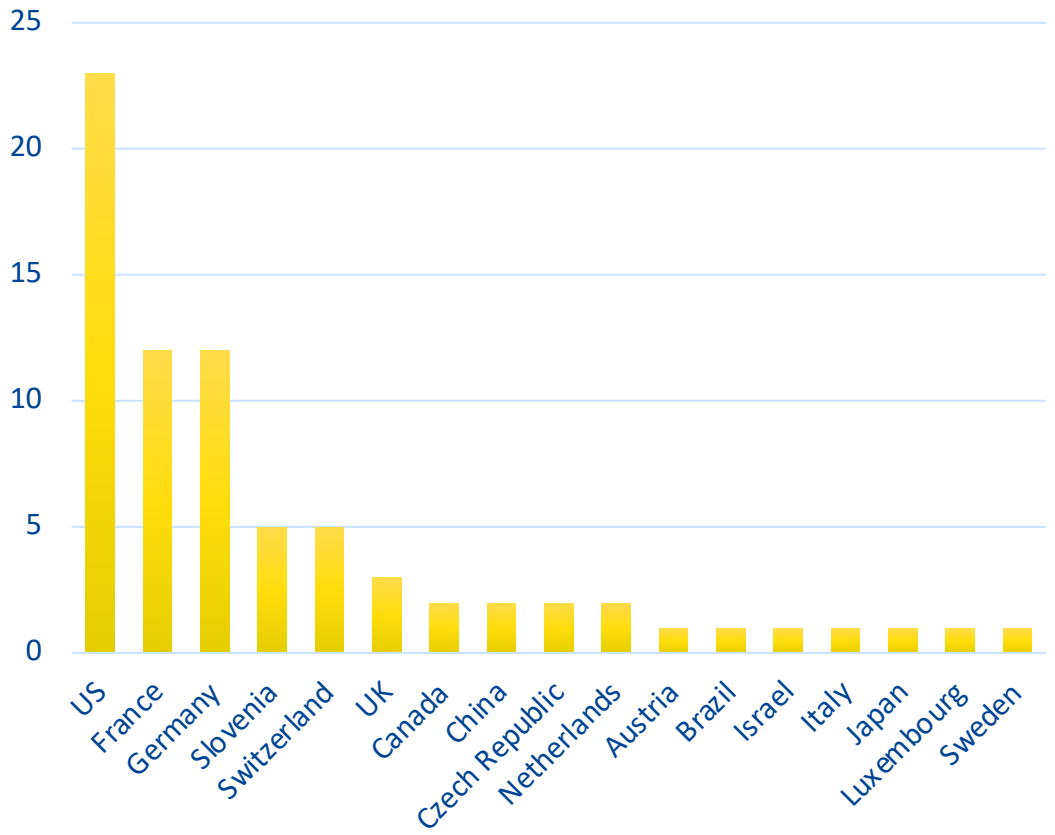
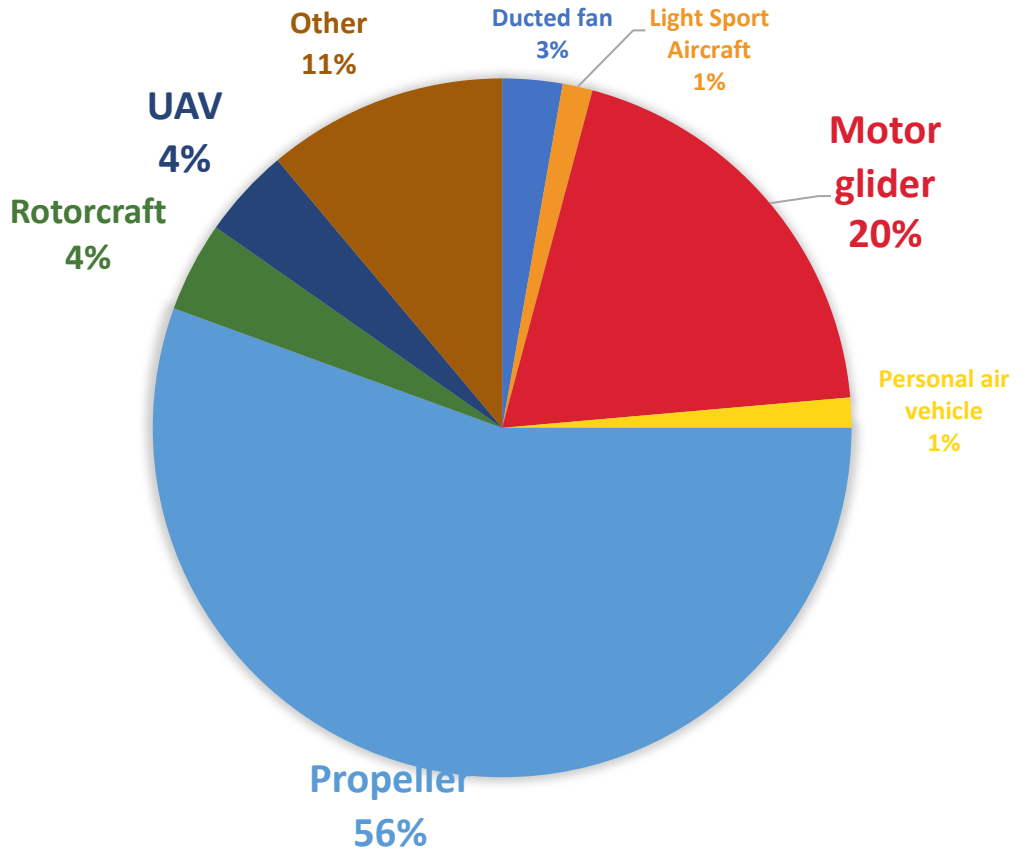
Number of aircrafts entered development per country



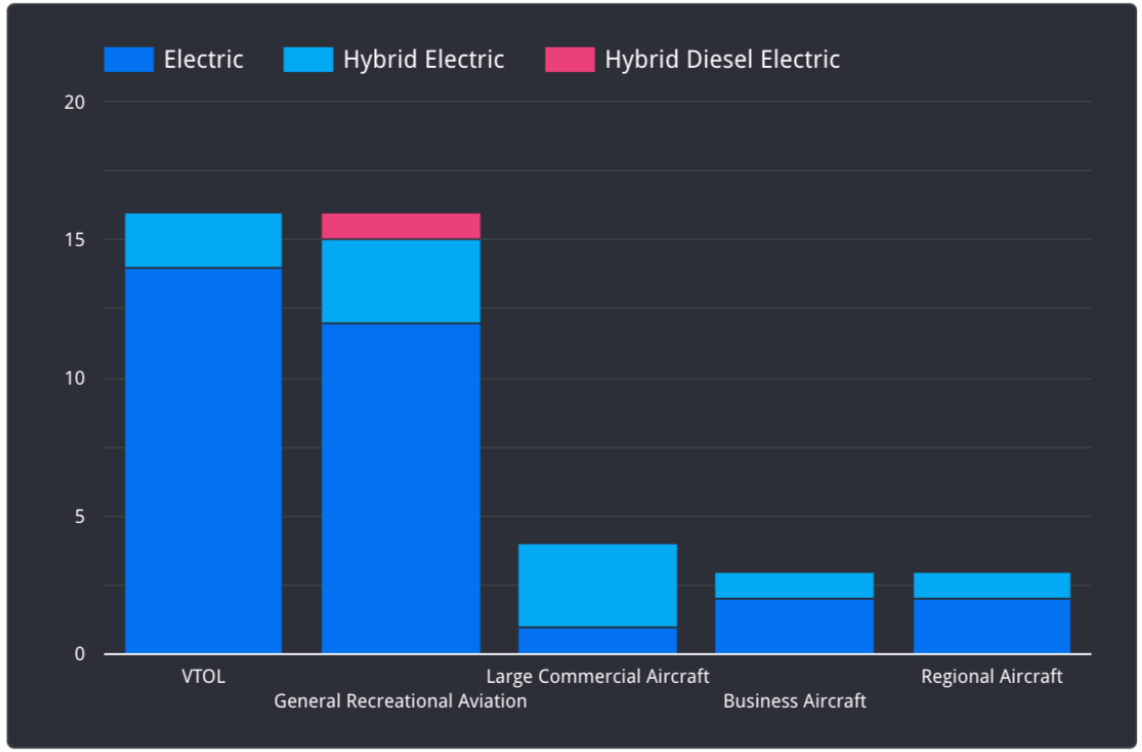
Number of aircrafts based on type

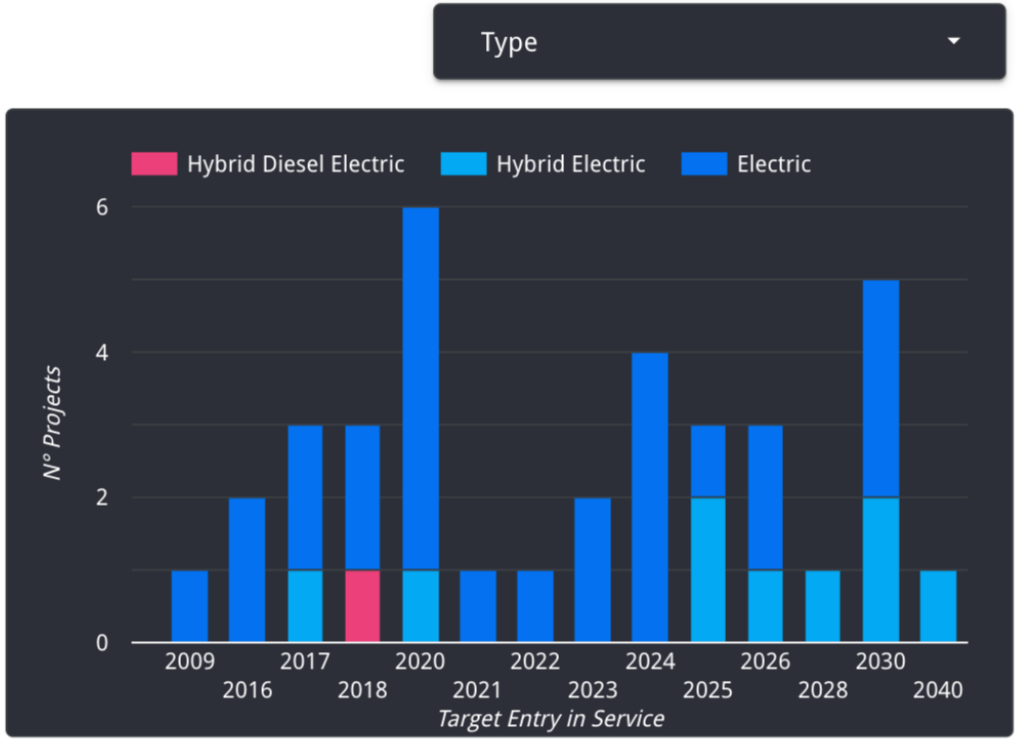


Source: EAFO (2022)

Properties of electric aircrafts being developed

Model types and target dates

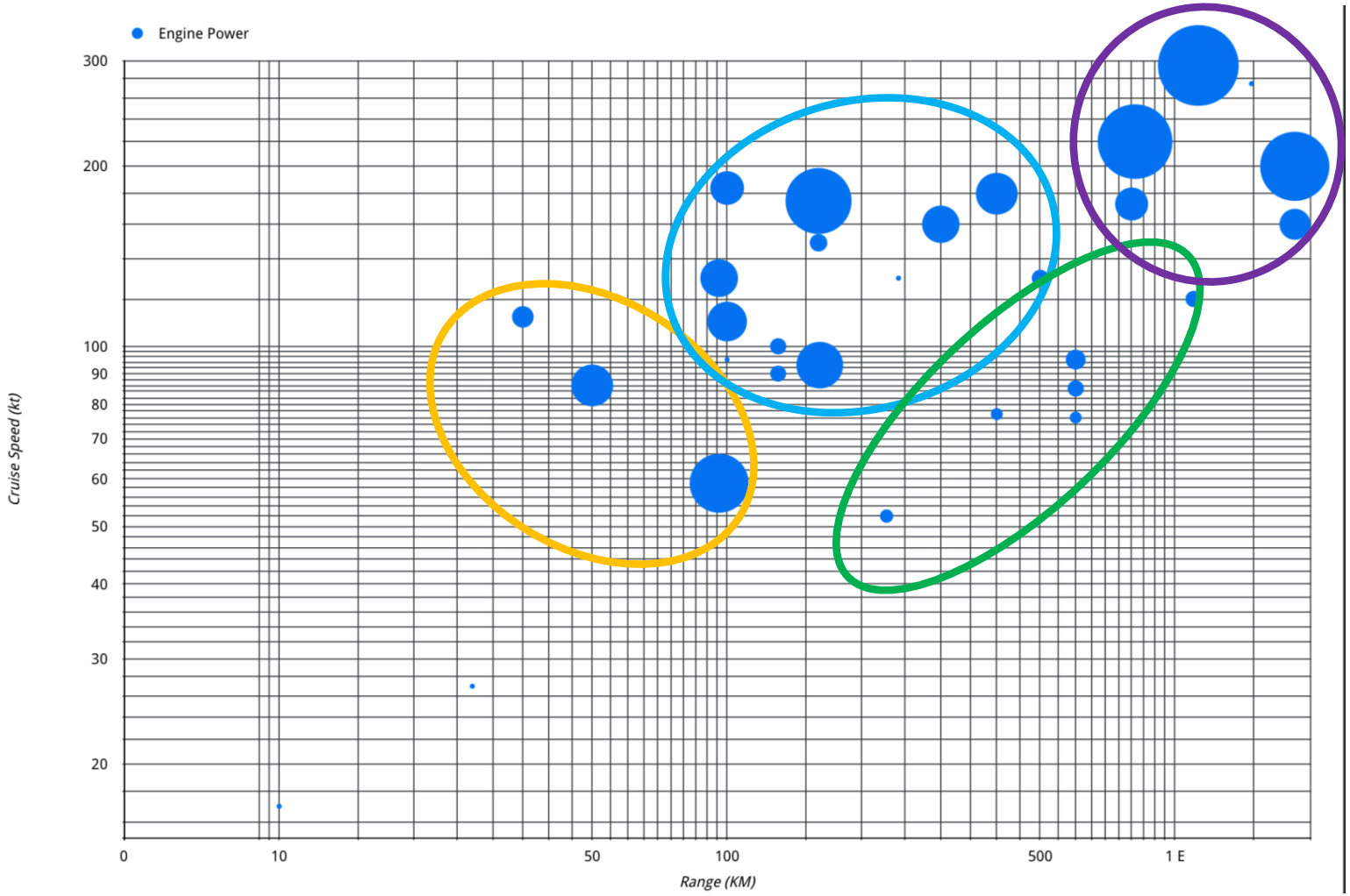




Source: ICAO (2022)

Technical parameter of electric aircrafts and clustering

The models being developed will shape future markets



Source: ICAO (2022)

Conclusions

- Electric aircrafts are good alternatives for urban and regional routes
- The smaller the size, the larger the benefits
- Need to think in all modalities (interconnections)
- Data is key to track / regulate this rapidly developing market

Contact?

We’re happy to hear your input! Please contact us via ec-alternative-fuels-observatory@ec.europa.eu