INSTITUTE FOR SUSTAINABLE AVIATION

TARMAC AEROSAVE

Life cyle & recyclability

- 1st July 2024 -

SPEAKER

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VP Sales

Specialised in End of Life, upstream challenges

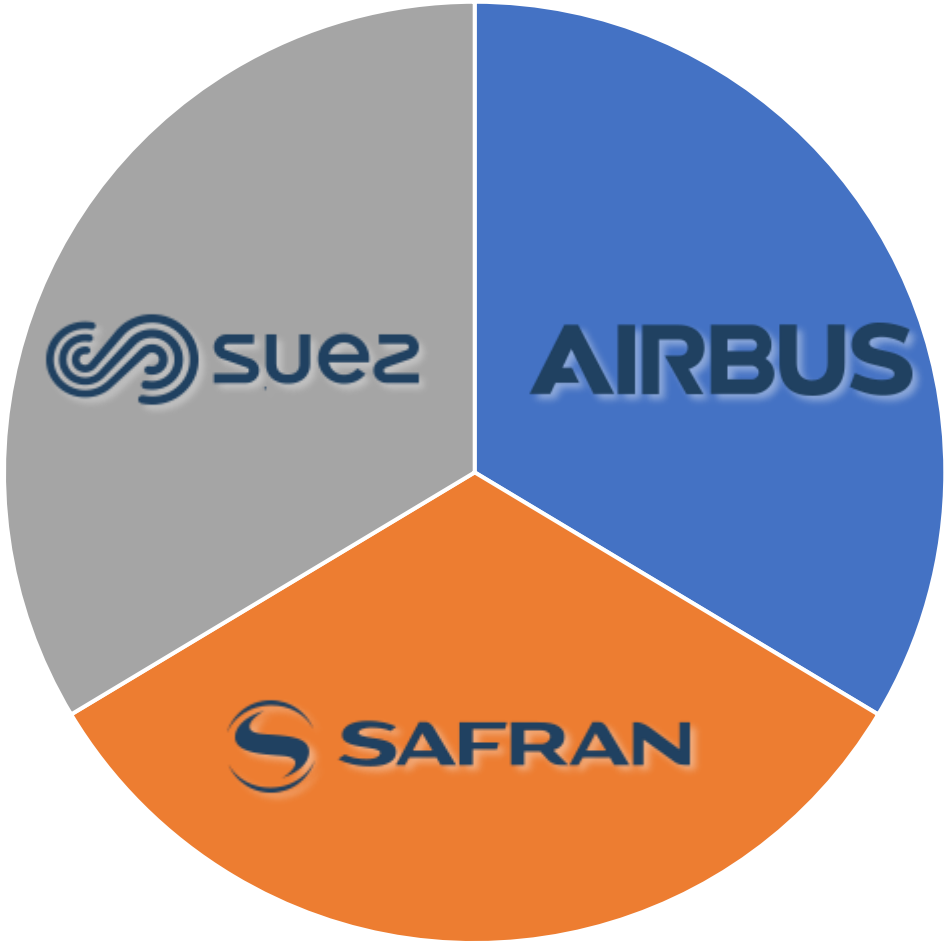
HISTORY

2000 Rising of aircraft decommissioning for economical reasons

2005 Airbus launches project **PAMELA**
Process for Advanced Management of End of Life of Aircraft

2007 PAMELA « becomes » **TARMAC**
Tarbes Advanced Recycling & Maintenance Aircraft Company

SHARE HOLDERS



SINCE 2007...

1560 AIRCRAFT ARRIVALS

1135 AIRCRAFT DEPARTURES

390 RECYCLED AIRCRAFT

365 ENGINES MAINTAINED

215 ENGINES RECYCLED

N°1 IN EUROPE FOR AIRCRAFT STORAGE
N°1 WORLDWIDE FOR AIRCRAFT GREEN RECYCLING

AIRCRAFT END OF LIFE

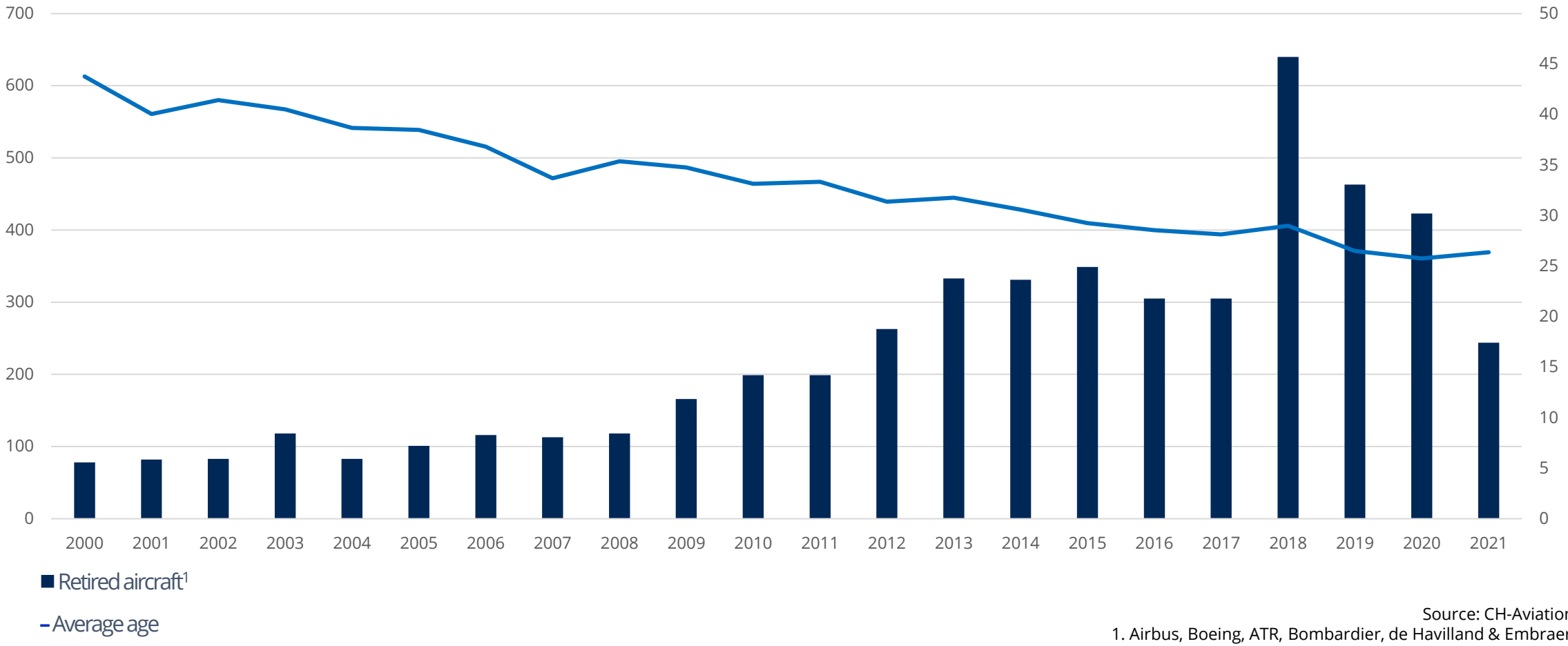
- Two main reasons to retire an aircraft from service:
  - Age
  - Potential market value of major spare parts: engines, landing gear, avionics…

- Over last 20 years, on average:
  - Age of retired aircraft has dropped from 45 to 27 years old!
  - Number of retired aircraft rocketed from ≈100 to +500 per year!

- Total number of retired aircraft last 20 years is +7,000 for all aircraft, +4,000 for major OEMs[1]

Source: CH-Aviation data
1. Airbus, Boeing, ATR, Bombardier, de Havilland & Embraer only.

AIRCRAFT END OF LIFE



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OVERVIEW

- Aircraft destruction is a “generic” activity
- Aircraft hold specific materials: high technology value, energy dependent and environmental impactful

- An expected tsunami of retirement: ≈ 20,000 aircraft in next 20 years[1]
  - COVID pandemic set a “pause” in retirement
  - Speed up in retirement as new technologies are introduced
  - More “dry” dismantling with less reuse & more waste

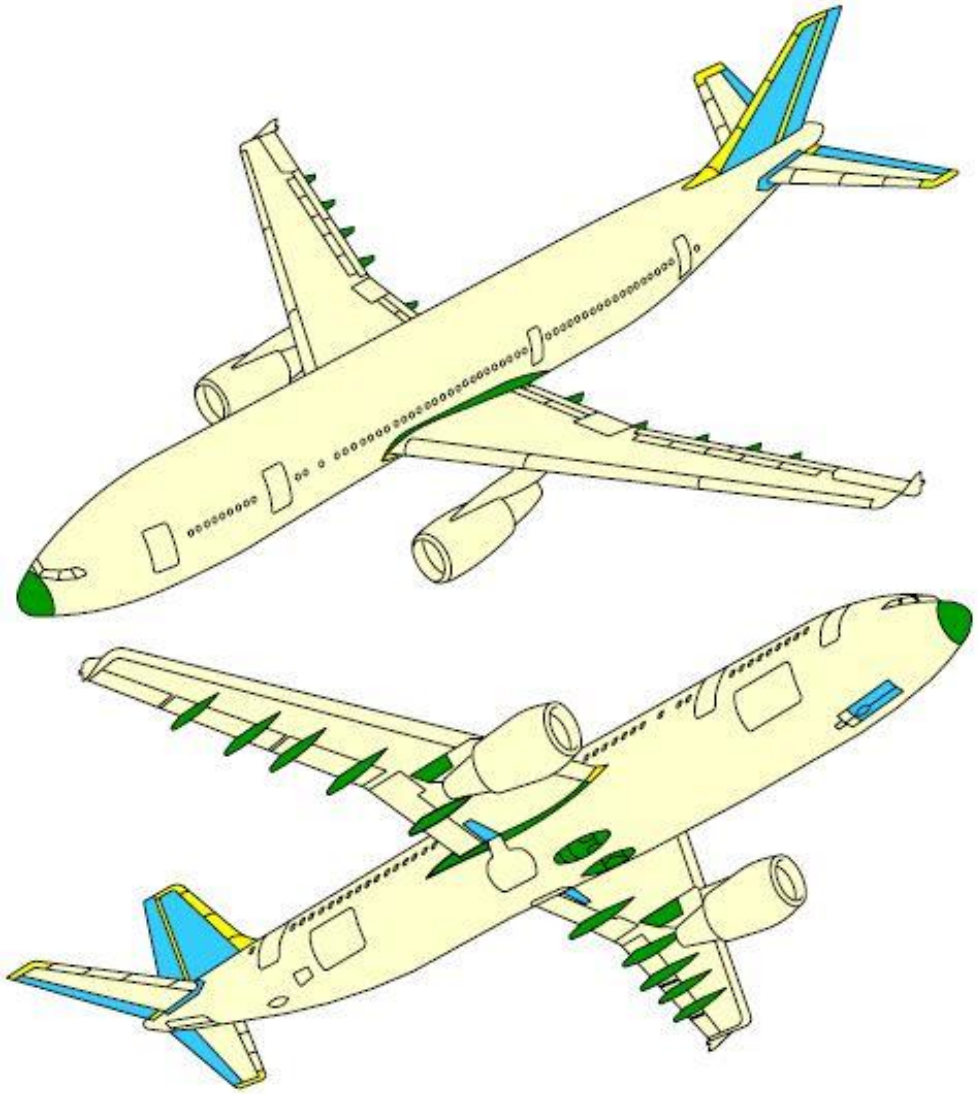
- Quick evolution of society & industry expectations
  - Societal pressure on aviation
  - Rising concern for lessors & investors, ESG compliance

Source
1. Airbus Global Market Forecast (15,250), Boeing Commercial Market Outlook (20,105), Clean Aviation.

COMPOSITION

A300

1974 / 1980



CARBON FIBER REINFORCED PLASTIC (CFRP)

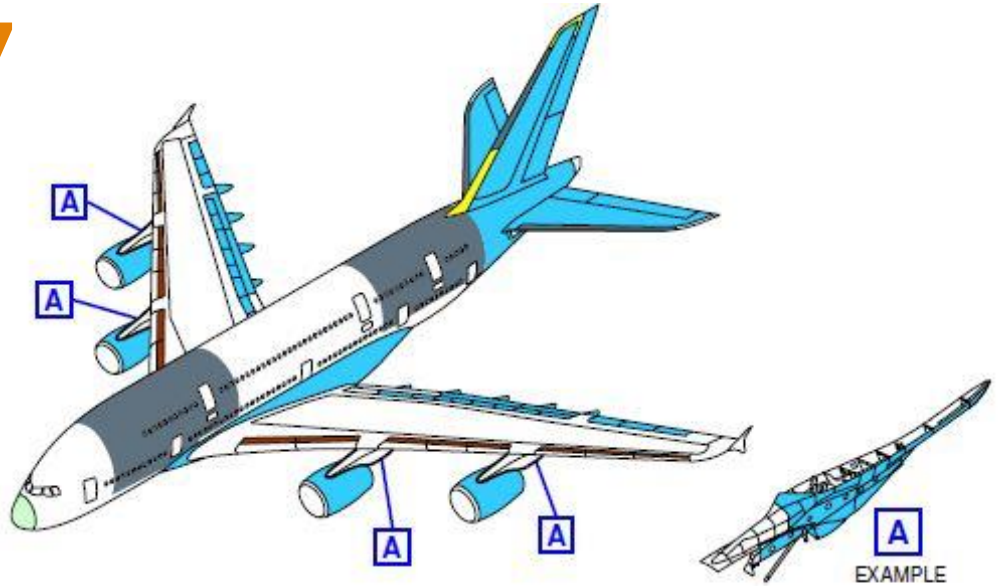
GLASS FIBER REINFORCED PLASTIC (GFRP)

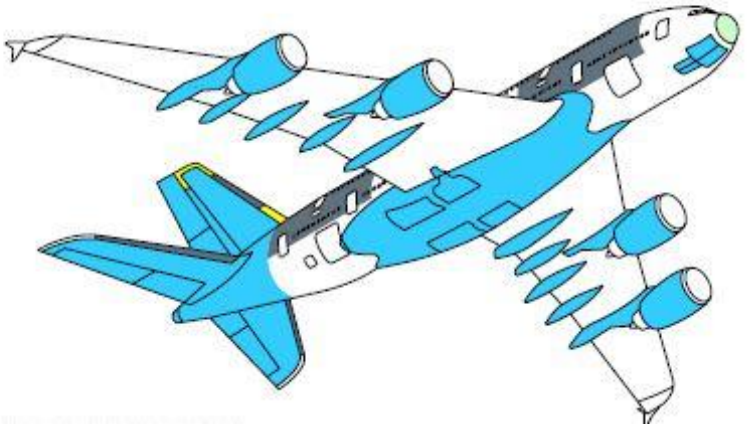
ARAMID FIBER REINFORCED PLASTIC (AFRP)

ALU ALLOY

A380

2007

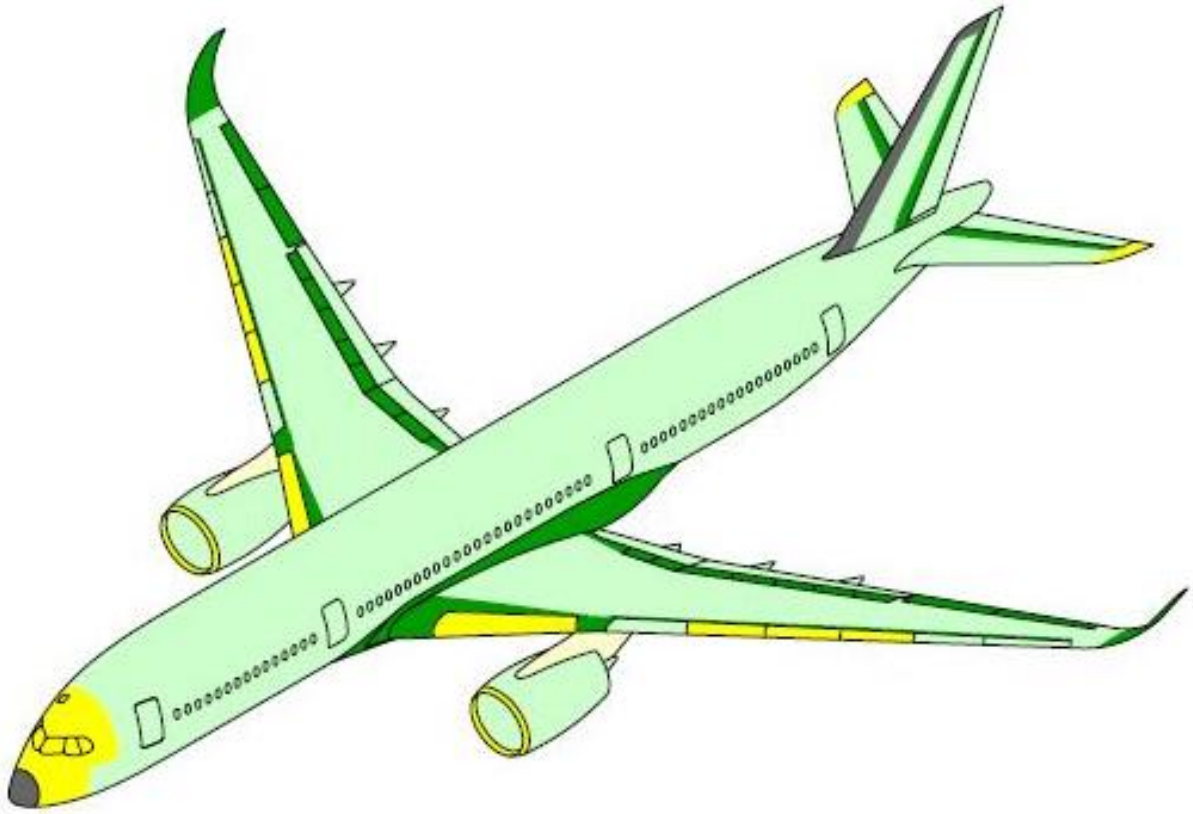




CARBON FIBER REINFORCED PLASTIC (CFRP)
GLASS FIBER REINFORCED PLASTIC (GFRP)
QUARTZ FIBER REINFORCED PLASTIC (QFRP)
GLASS REINFORCED ALUMINIUM LAMINATE (GLARE)
THERMOPLASTIC
ALU ALLOY

A350

2015



ALU ALLOY

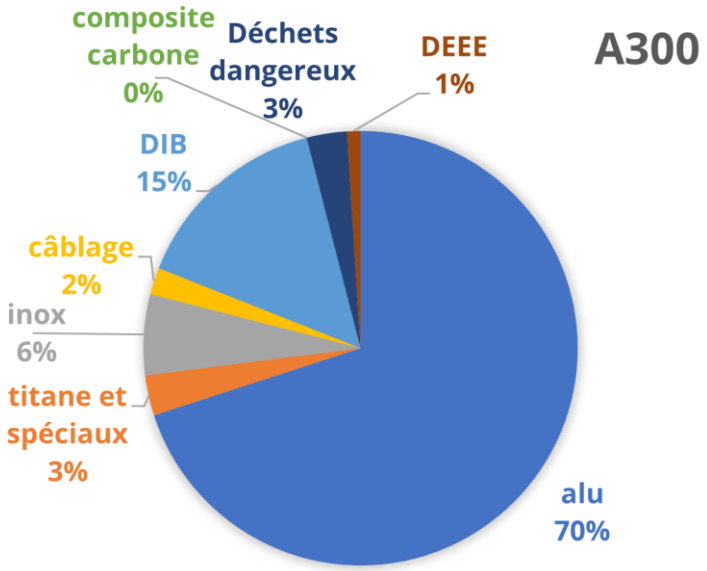
CFRP MONOLITHIC

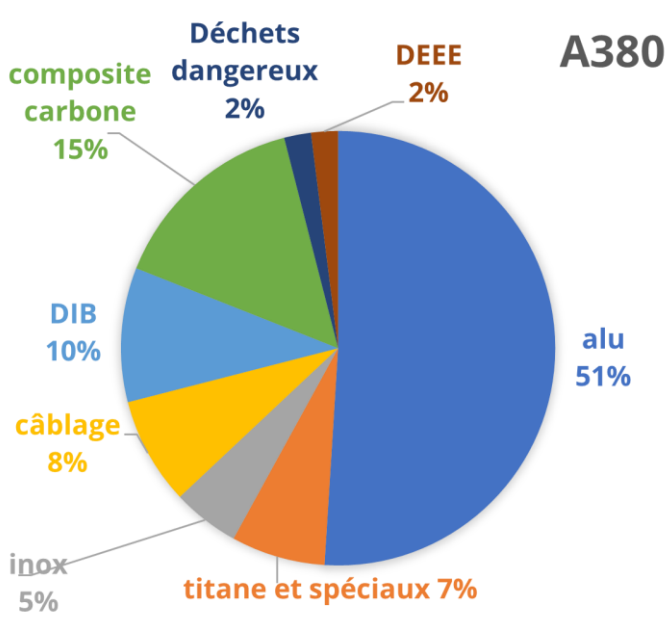
CFRP SANDWICH

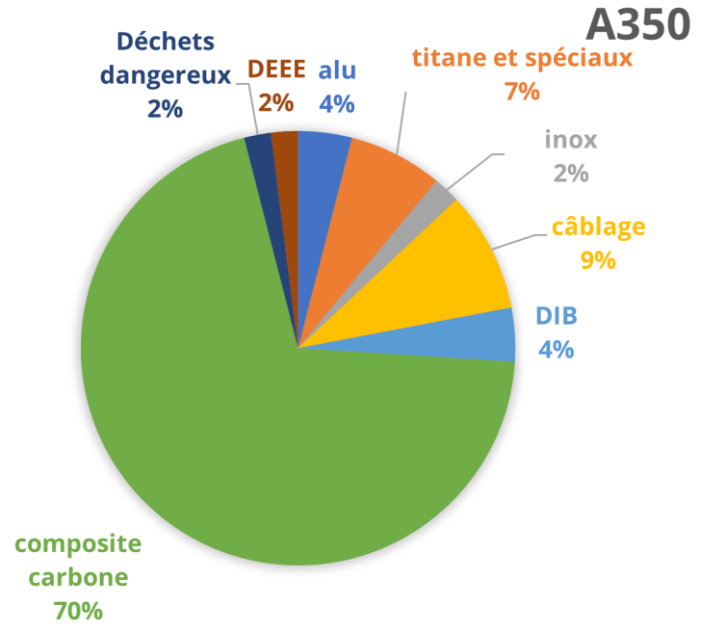
QUARTZ, GLASS

TITANIUM

COMPOSITION



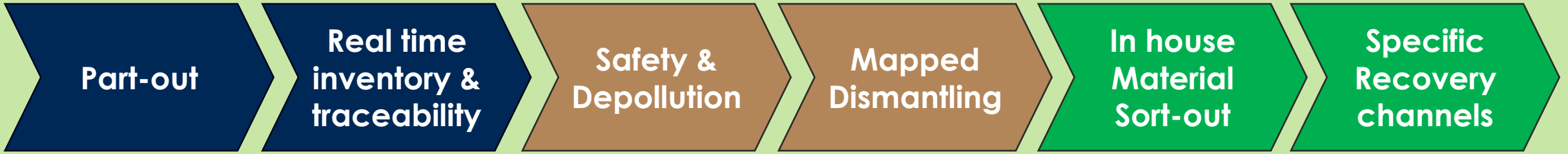




CLASSIC AIRCRAFT DISMANTLING

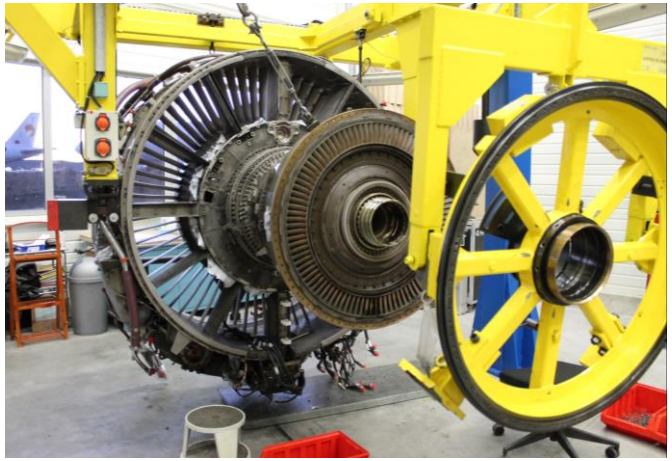
OUR AIRCRAFT RECYCLING

A controlled step by step process

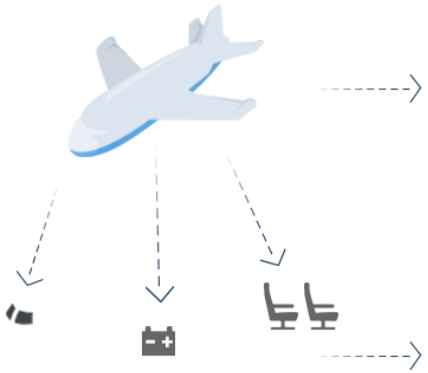


Continuous environmental impact management:
Water & Soil
Resources optimised segregation with minimal dilution

ENGINE RECYCLING



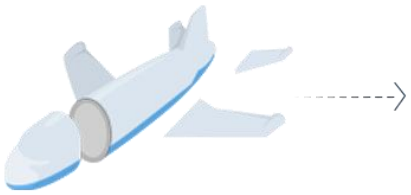
EQUIPMENT REMOVAL



EQUIPMENT SEGREGATION

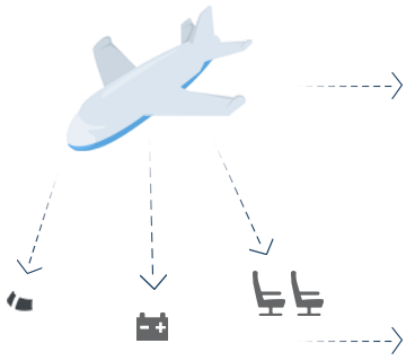
MATERIAL SEGREGATION

AIRFRAME WIRE CUT



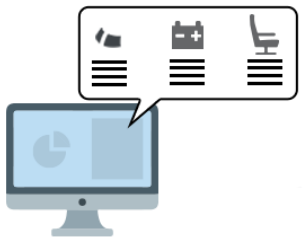
SHIPMENT & RECOVERY

STEP BY STEP



Component Dismantling

Airframe Disposal
with unique wire saw cutting process

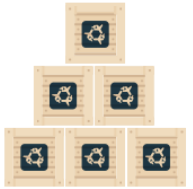


Daily Online Inventory with pictures
of each removed component

Segregation of Materials

Component Packaging

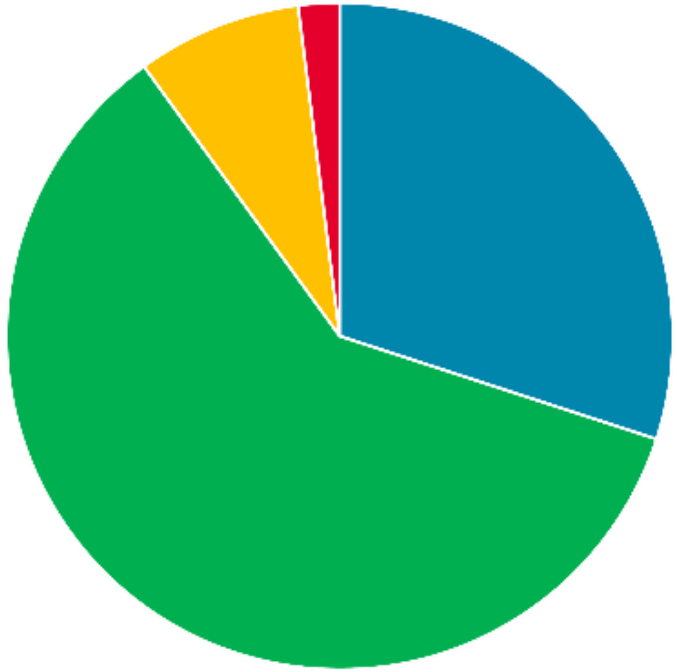
Materials sent to waste
recovery channels



Component Storage & Shipment

OUR AIRCRAFT RECYCLING

- Direct re-use: spare parts (USM)
- Raw material recovery, upcycling…
- Energy recovery
- Final waste



CHALLENGES

- Identification
- Segregation
- Evolution
- Downstream channels
- Regulation
- Incitation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