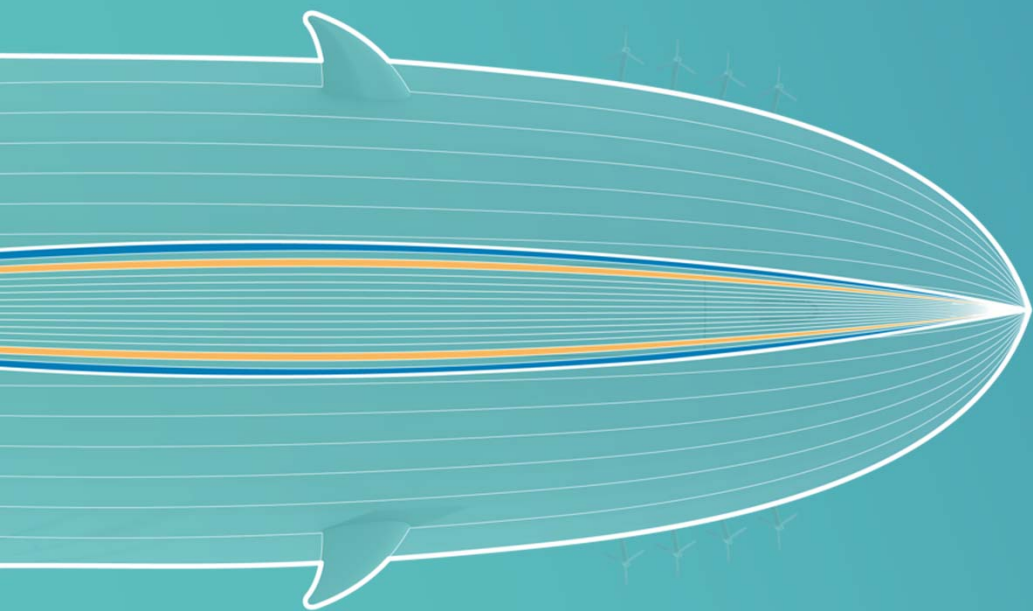


FLYING WHALES

CONNECTING THE LAND-LOCKED WORLD TO THE GLOBAL ECONOMY

A breakthrough green air transport solution for heavy cargo
ICAO-WFP Workshop 2023 – 03/03/2023





FLYING WHALES PURPOSE

FLYING WHALES'S PURPOSE STATEMENT

One idea to solve two major problems

Purpose #1

Contribute to the expansion of economic development by unlocking land-locked territories lacking in infrastructure

Purpose #2

Contribute to the significant reduction of cargo transport's environmental impact



FLYING WHALES'S PURPOSE STATEMENT

One idea to solve two major problems

Purpose #1

Contribute to the expansion of economic development by unlocking land-locked territories lacking in infrastructure

Purpose #2

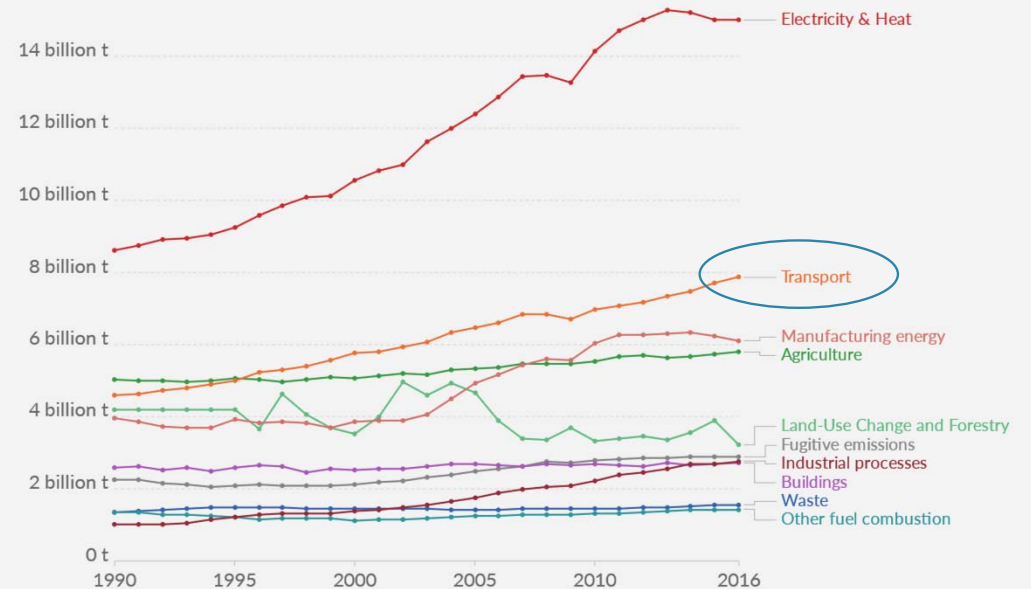
Contribute to the significant reduction of cargo transport's environmental impact



Greenhouse gas emissions by sector, World

Greenhouse gas emissions are measured in tonnes of carbon dioxide-equivalents (CO₂e).

Our World
in Data



Source: CAIT Climate Data Explorer via. Climate Watch

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY



FLYING WHALES'S PURPOSE STATEMENT

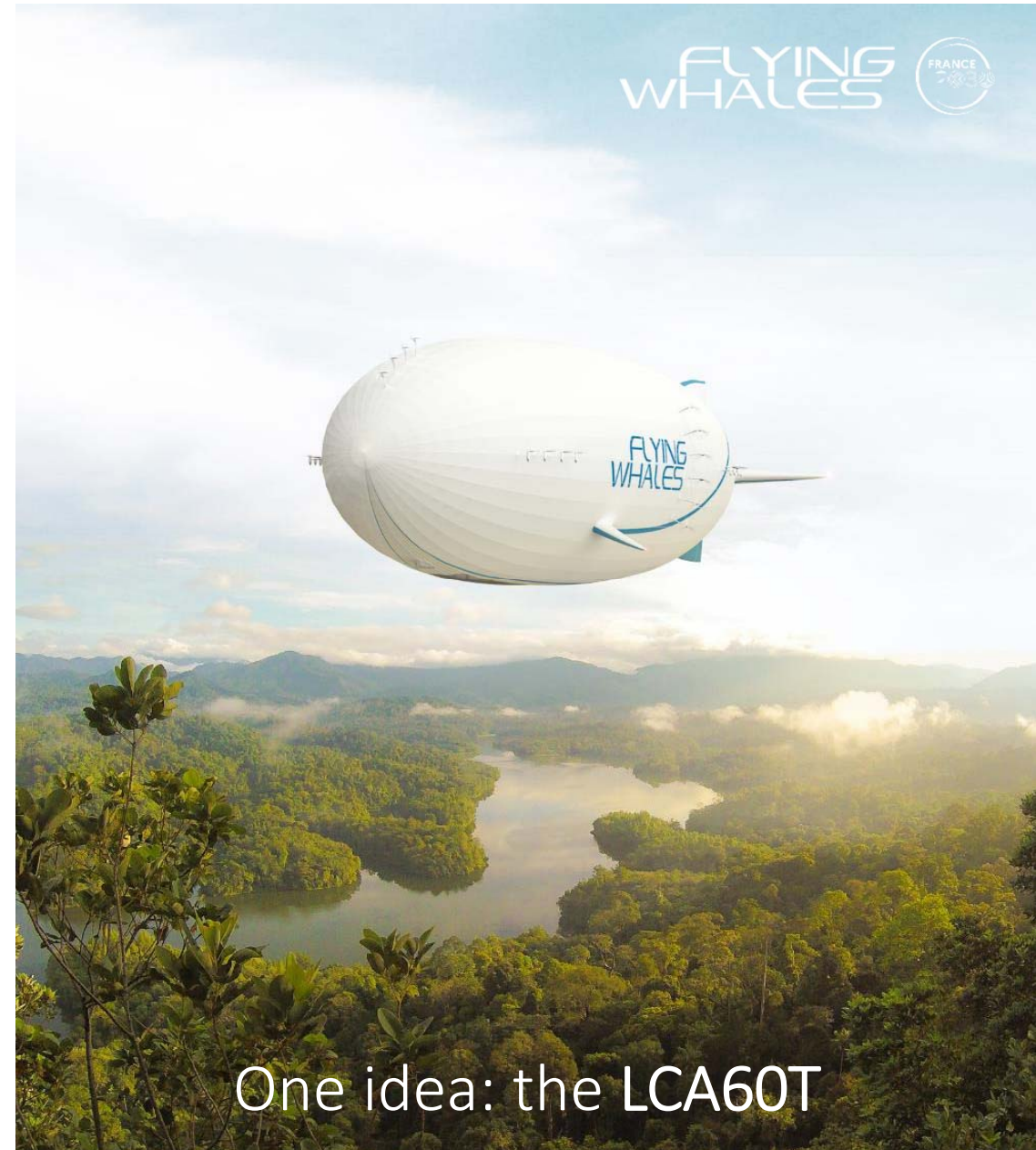
One idea to solve two major problems

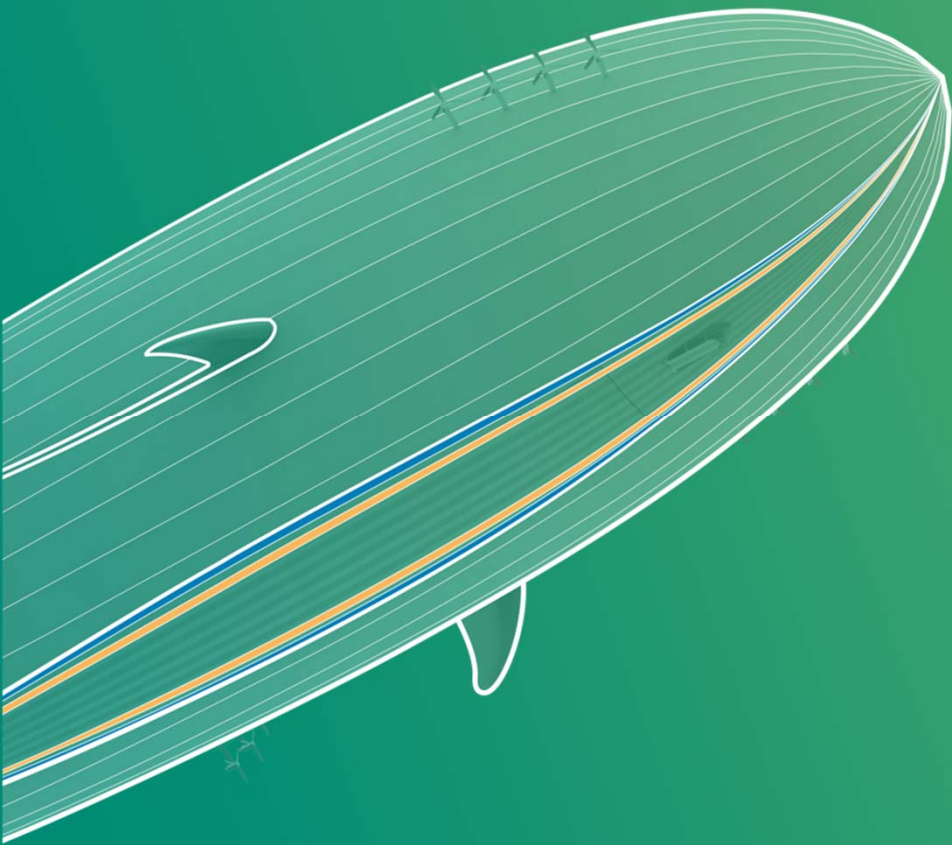
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THE SOLUTION

BASE PRINCIPLE OF LCA60T AIRSHIP

A well-known technology embarking cutting edge innovations

Helium as a safe lifting gas

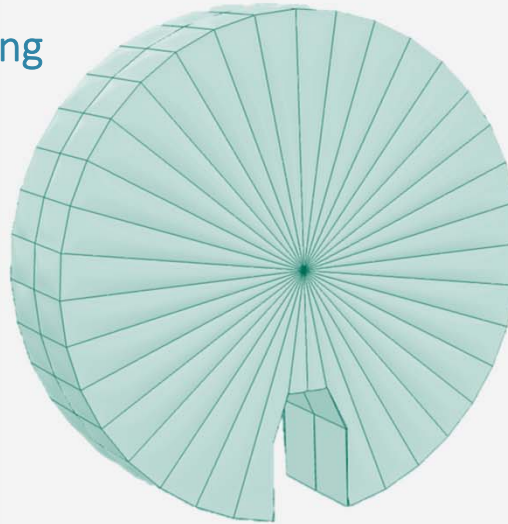
An inert gas, stored,
ensuring lift

Helium

2

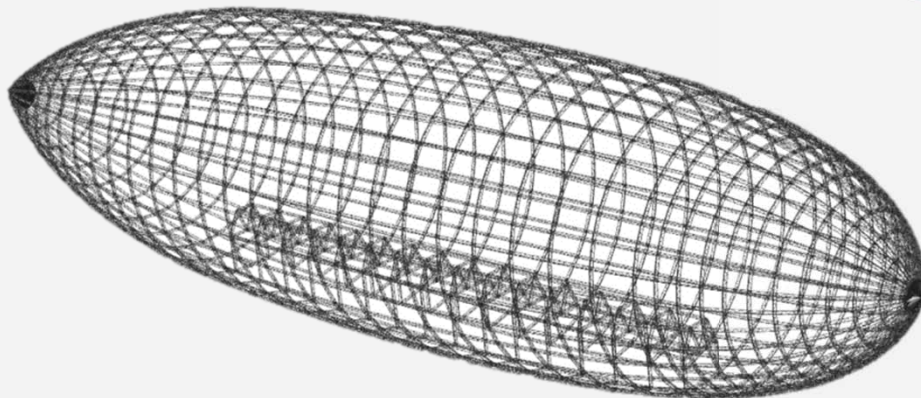
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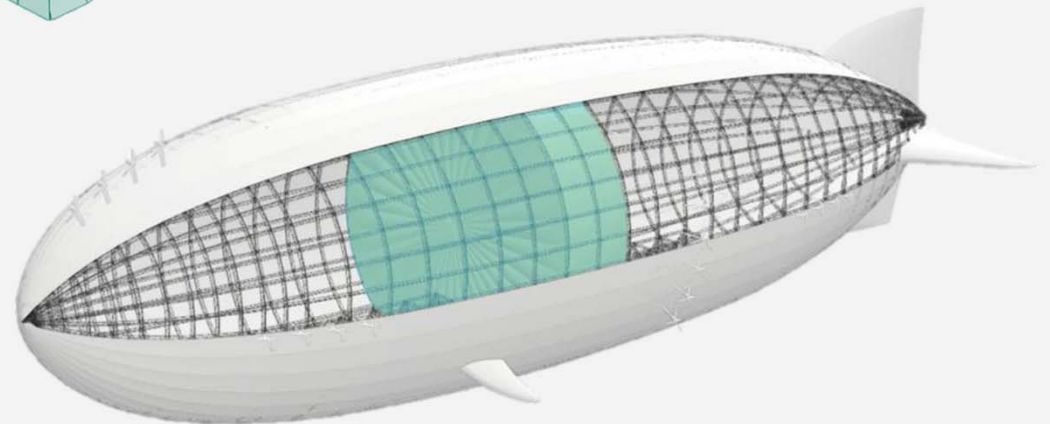
A rigid structure

For maximum operational
security



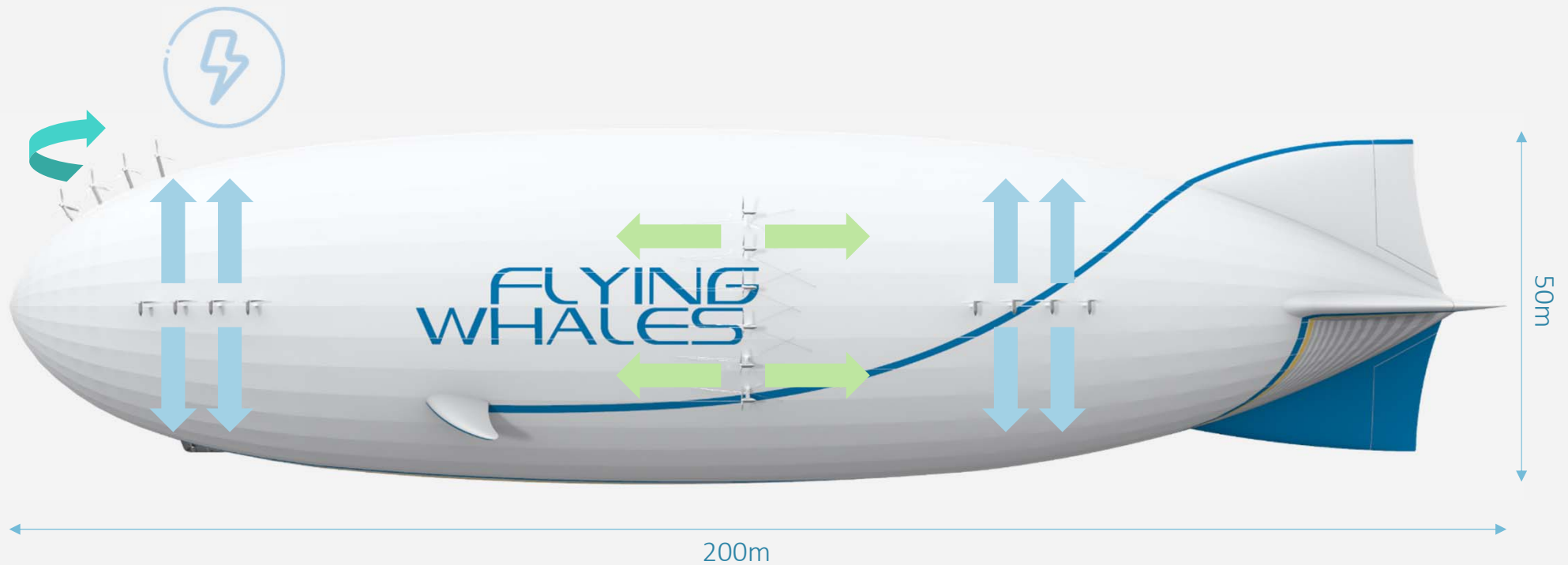
Contained in 14 unpressurised cells

Ensuring maximum safety



FLIGHT AND POSITIONNING

32 electric propellers ensure perfect control and flight in all directions

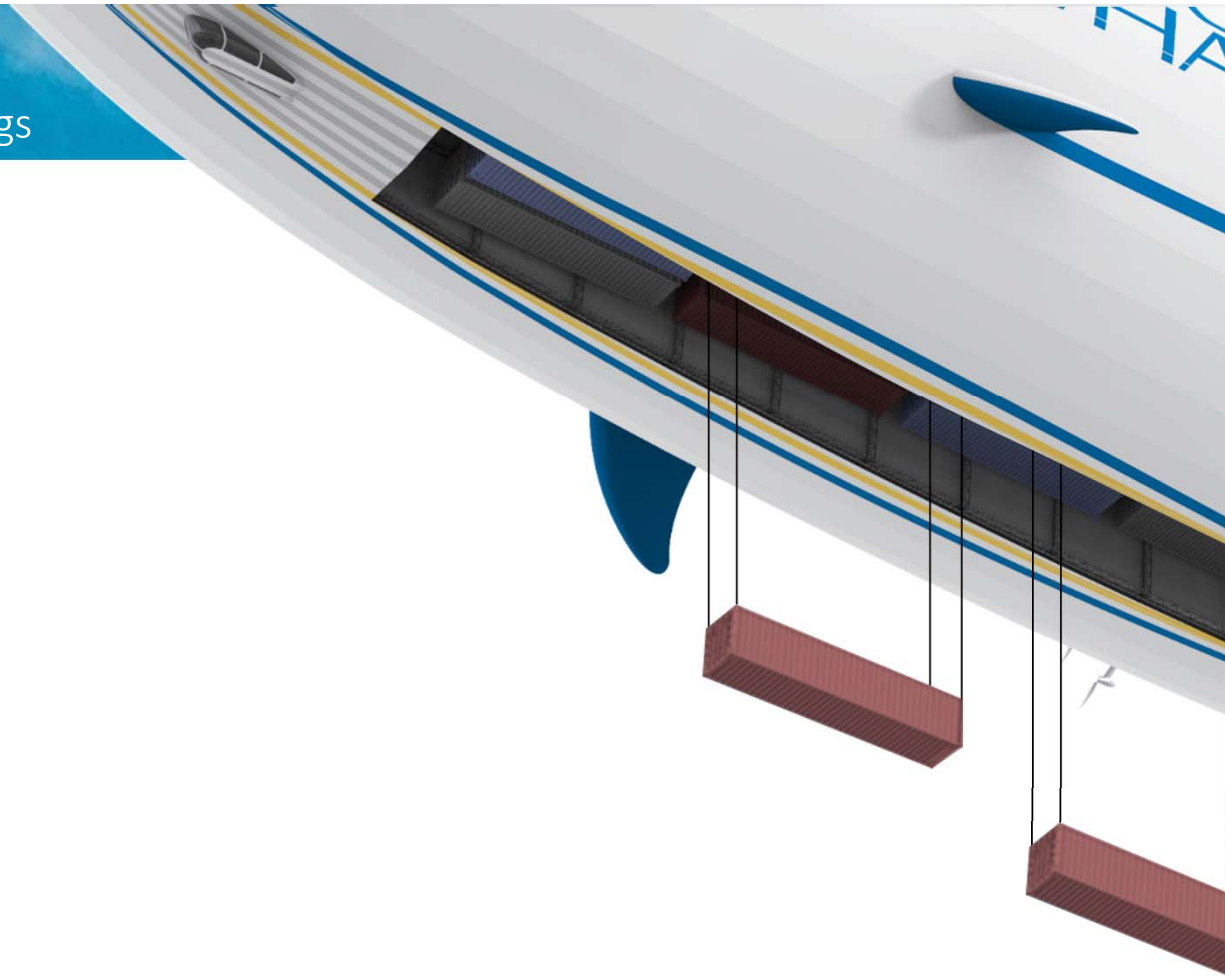


7 propulsion points

Cruise speed of 100 km/h
Vertical Take-Off and Landing

CARGO BAY AND LIFTING CAPACITY

Several transport modes: in cargo hold or under slings



→ 12 times more payload than heavy-duty helicopters

A LOW CARBON CARGO AIRFREIGHT SOLUTION

By nature and by design

GROUND FOOTPRINT IN OPERATIONS



0 ground impact by operating in hover flight
⇒ No transport infrastructure, nor modification, nor upgrade.

EMISSIONS IN OPERATIONS



10 to 50 times less emissions than helicopters
⇒ Under hybrid electric propulsion.

1st LCA60T Generation



-50 to -80% CO₂ emissions with SAF
⇒ Improving local air quality with -90% PM and no Sox.

+

H₂

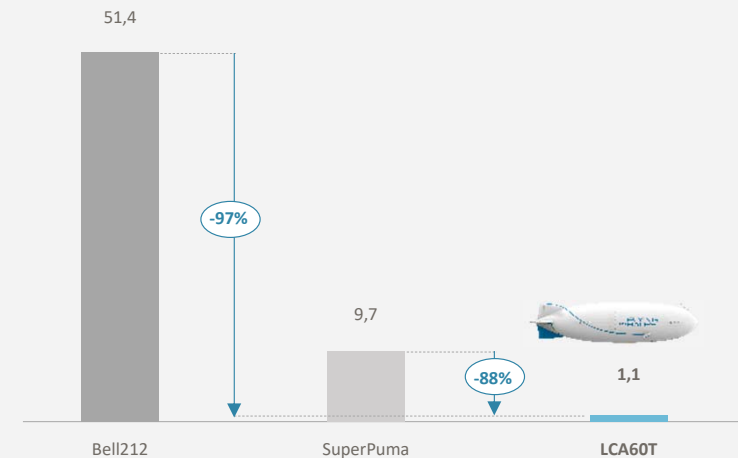
0 emission in flight
⇒ Replacing turbines with decarbonized H₂ fuel cells.

2nd LCA60T Generation



Comparison of CO₂ Equivalent Emission

LCA60T* vs. Super Puma/Bell 212 helicopters
Mission at 1 500m ASL, 200 km, 60 tonnes
Unit: kgCO₂eq/t/km



*Comparison based on hybrid-electric airship



FLYING
WHALES

COMPANY AND
APPLICATIONS

CORPORATE VIDEO

Video available with the following link: <https://youtu.be/ZSrMJHuUyX8>



FLYING WHALES

A WIDE COVERAGE OF MARKETS AND APPLICATIONS

Wherever infrastructure is insufficient, inadequate or damaged



FLYING WHALES IS...:



... an ambitious aeronautical program : the LCA60T

... 2 companies :



FLYING
WHALES
INDUSTRY



the manufacturer
on 3 production sites

FLYING
WHALES
SERVICES



the operator
Of 150+ LCA60T and Bases

TWO BUSINESS MODELS

Centered around FLYING WHALES Industry and FLYING WHALES Services



Model 1: Sale of transportation service

(87% by 2032 so far)



Model 2: Sale of LCA60Ts & service know-how

(13% by 2032 so far)



IMPROVING HUMANITARIAN AID AND DISASTER RELIEF OPERATIONS

Three main cooperation areas



Disaster response

- Reaching a disaster-hit site **rapidly** is crucial to saving lives.
- Disasters significantly alter transport & network infrastructures.
- LCA60T can reach such areas to deliver **immediate aid**.
- **Oil Spill Response** case studies in progress



Refugee camps supply or remote villages

- The supply of **essential resources** to refugee camps or isolated villages can be extremely challenging.
- Alleviate camps supply **complexity** by handling heavy and bulky loads.
- **FLYING CARE**: mobile hospital project to increase universal healthcare coverage in remote areas



Conventional logistics

- Use cases highlighted by WFP at
 - 2020 Airship Conference
 - 2021 & 2022 GHAC
 - 2022 HAES
 - Airship joint studies in progress
- **UN-ECLAC** 2021 conference & 2022 study air connectivity and humanitarian aid ([click here](#))
- **Supply regional or local warehouses** from international logistics infrastructures.

ONGOING STUDY CASE IN SOUTH SUDAN WITH WFP

Improving current delivery system with LCA60T



Transportation with LCA60T airship is more efficient

- Volume transported by LCA60T: 22,585 t (15%)

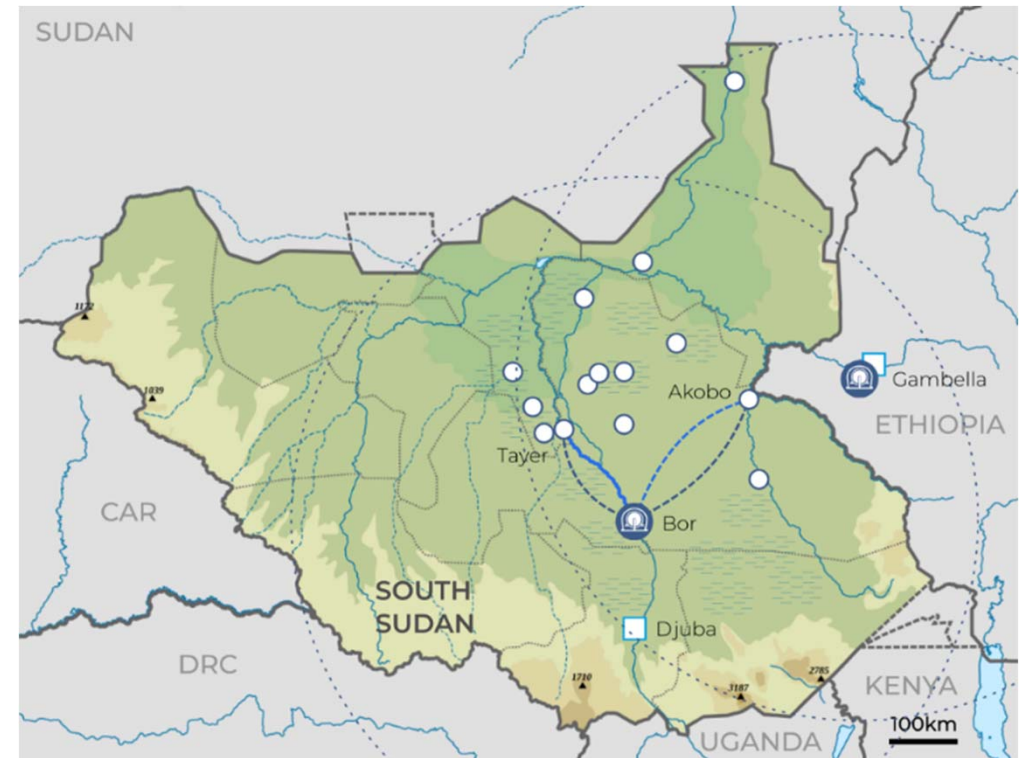
→ In terms of **cost**: up to 18% decrease

→ In terms of **number of days of operations**:

- 28% decrease: from 5,400 days to 3,900 days
- 323 days of operation are expected for LCA60T:
 - 212 days** from Bor base
 - 111 days** from Gambella base

→ Additional high value advantages:

1. All-year-round delivery
2. Reduction of warehousing needs (potential additional cost reduction)
3. Increase in security of personnel & integrity of cargo
4. Increase safety
5. Decrease in CO₂eq emissions (see following slide)



LCA60T Base Remote community WFP warehouse



FLYING CARE PROJECT ORIGIN

FLYING WHALES's LCA60T Solution can deliver anywhere by air (thanks to its loading and unloading capacities from stationary flight) heavy loads and large volumes.

This led FLYING WHALES team to imagine FLYING CARE Project: a rigid mobile hospital delivered by air and mutualized between remote villages, all year round & several times a year.

FLYING WHALES leads a Partnership with SIEMENS, INGEROP and ROLAND BERGER to accelerate the development of FLYING CARE mobile hospital.

FLYING
CARE

SIEMENS

INGÉROP

Roland
Berger

FLYING
WHALES



To foster cross-
sectoral and
innovative
partnership
initiatives



WORLD HEALTH ORGANIZATION STATEMENT



“ **Half the world** lacks access to essential health services. ”

“ More than **two billion people** worldwide lack access to safe surgical services. ”

THREE REGIONS INVESTIGATED

FLYING
CARE

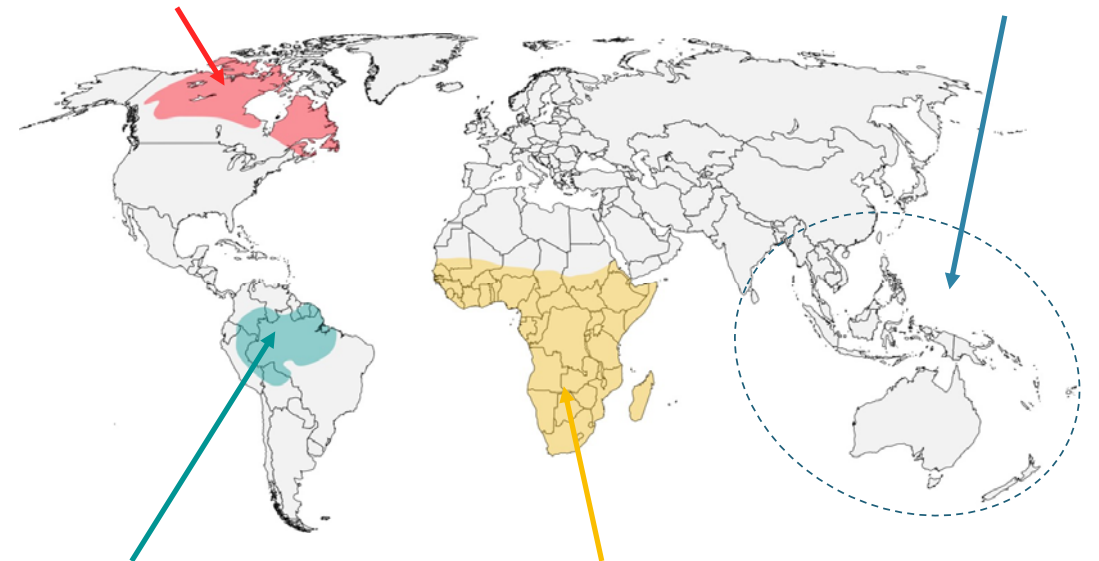
Identified needs in regions initially investigated by FLYING CARE Project

1. North of Canada

- Imaging equipment
- Dentistry, Eye care etc.

Asia Pacific and Oceania

Region to be further investigated



2. French Guiana and Amazonia

- Laboratories
- Imaging equipment
- Surgeries and specialty care

3. Sub-saharan Africa

- Communicable and non-communicable diseases
- Laboratories and imaging equipment
- Targeted care campaigns

FLYING CARE

High-standard curative medical
care for remote populations

Adjusted to local needs

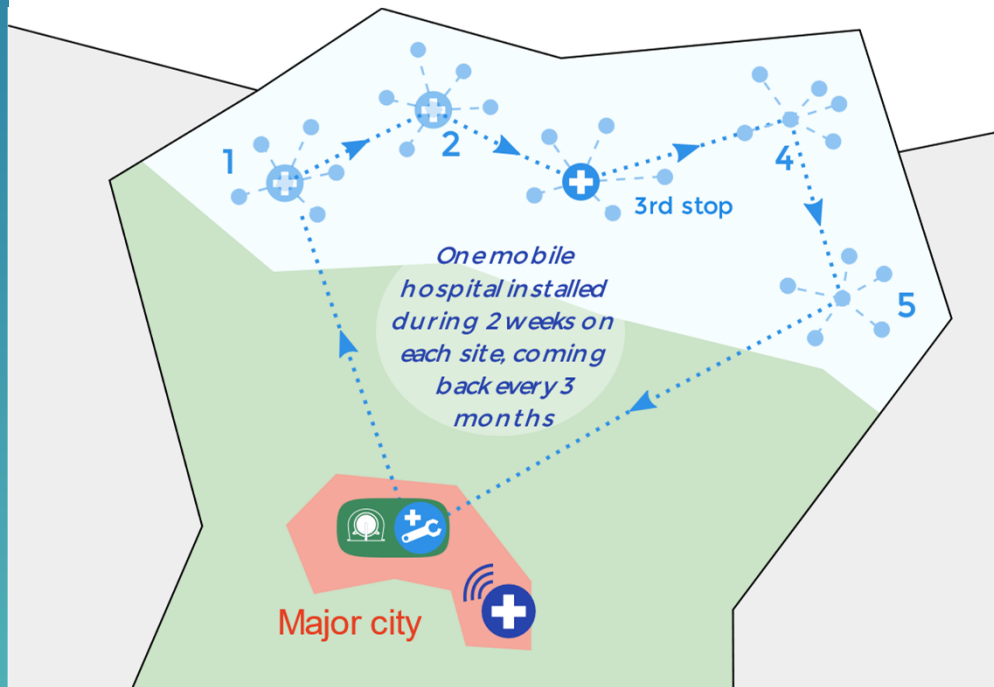
In a rigid mobile hospital



630m² of modular infrastructure
(up to 90m long, 7m wide, 5m high)



REGULAR AND ADAPTED MEDICAL TOURS



FLYING CARE VALUE PROPOSITION

FLYING CARE



Healthcare is centralized,
isolated communities lack
vital access



Healthcare is
decentralized,
**everybody has
equal access**



Implementing and
maintaining infrastructure
is extremely costly



CAPEX and OPEX are
mutualized, infrastructure
becomes cost-efficient, it is
regularly maintained after
each medical tour



Several pathologies
are undetected and
untreated



High-standard medical
infrastructure, **safe
surgeries** available
everywhere



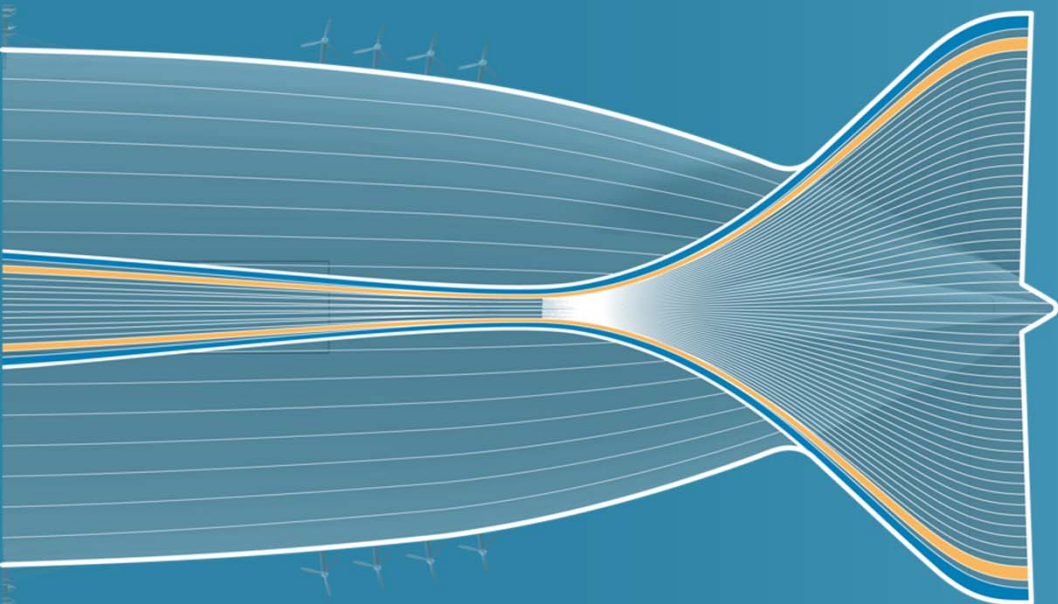
For universal health
coverage and quality
essential healthcare
services



To build resilient
and innovative
infrastructures



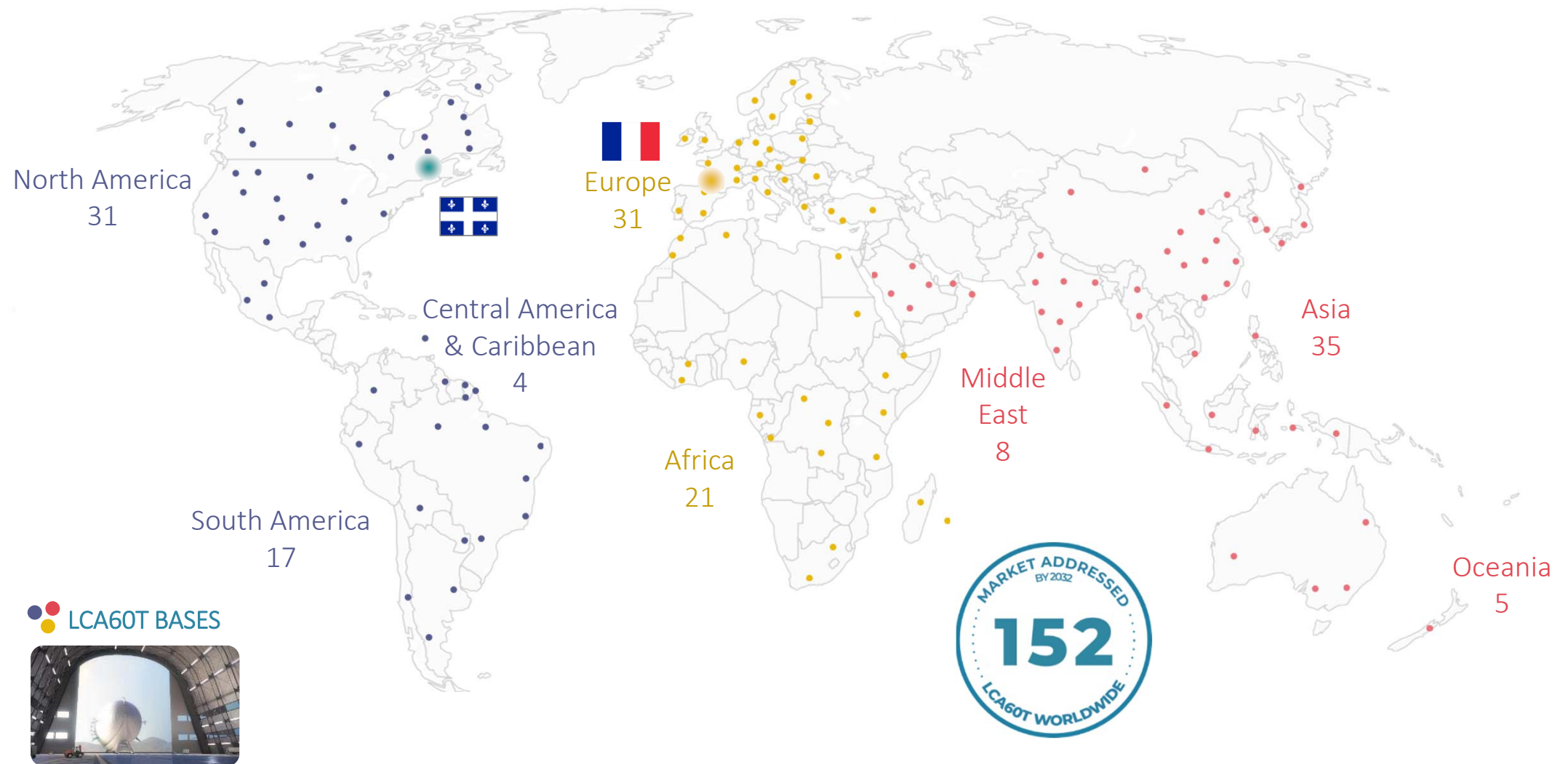
To reduce inequalities,
support developing
countries



OPERATIONS, SAFETY
AND CERTIFICATION

A GLOBAL PRESENCE

More than 100 LCA60T bases operated by 2032



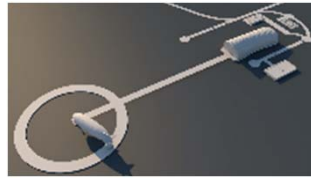
FLYING WHALES SERVICES OVERVIEW



FLYING WHALES SERVICES is both an “AIRLINE” and an “AIRPORT” operator



The Airship:
LCA60T



Base Deployment



Operations
Management



Maintenance
& Repair
Organisation

Given the specificities of the LCA60T solution, FLYING WHALES SERVICES will **train** its own personnel



Flight crew training
organisation



Ground training
organisation



Maintenance
training
organisation

AIRSHIP FLIGHT CREW LICENSING

ICAO Pilot Training and Licensing Panel (PTLP)



Working groups for Annex I revision with new approach of licensing Pilots with Competency-Based Training consideration

FLYING WHALES included to propose revision of Airship elements

French DGAC with support from FLYING WHALES is reviewing and making adequate amendment propositions to ease international use of Airships.

On-going discussion to ensure Airship pilot licenses requirements are set to follow safety of future operations and future airships allowing the international recognition of pilots around the world.

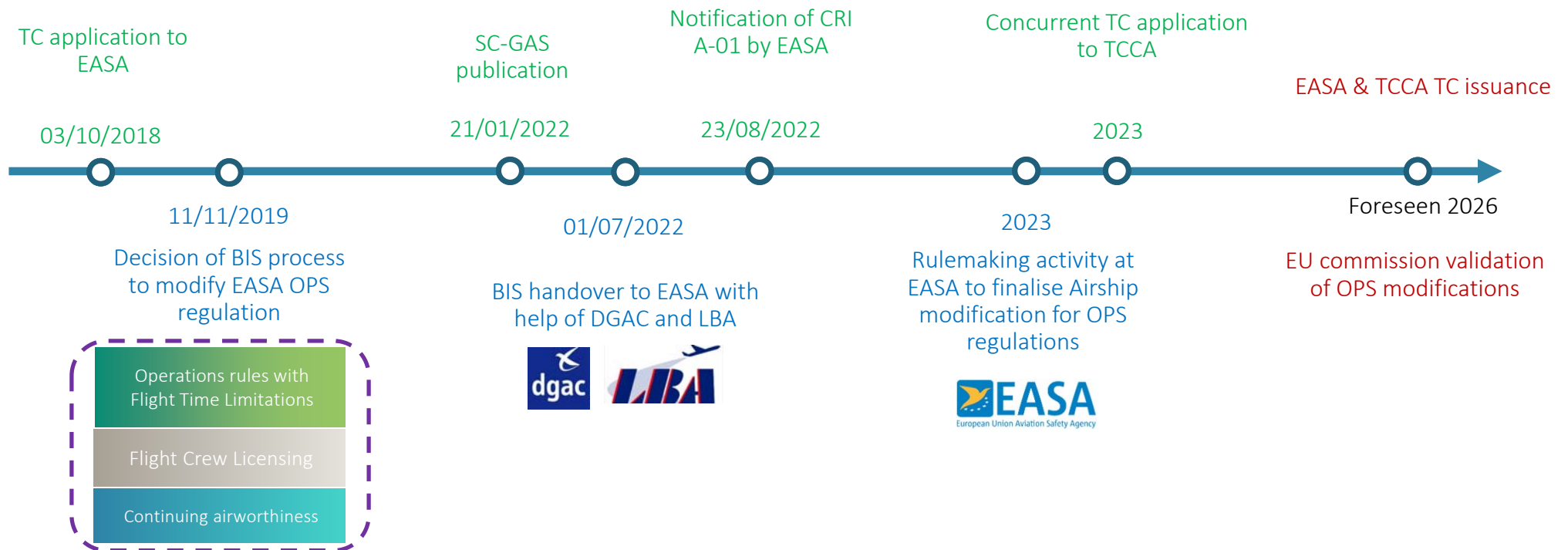
CERTIFICATION STRATEGY



- LCA60T will obtain a concurrent Type Certificate (TC) from EASA (EU) and TCCA (Canada).



- LCA60T Type Certificate will then be validated by other Civil Aviation Authorities like FAA (USA).



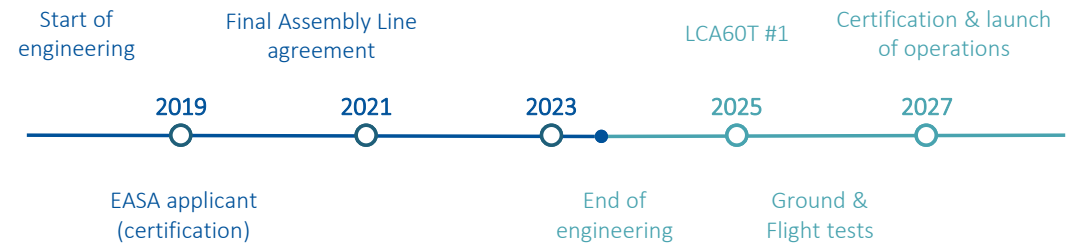
FROM START-UP TO SCALE-UP

FLYING WHALES is accelerating its development with the set-up of its final assembly lines



FLYING WHALES enters the **FRENCH TECH NEXT40** and confirms its strategic position for the transport of tomorrow.

- The French Tech Next40 is a **French government support program** dedicated to the most successful French startups to help them on their trajectory to become **world-class technology leaders**.
- 130 employees in January 2023
- 100 recruitments during the year 2023 (Paris, Bordeaux, Montreal)



CONTACT US

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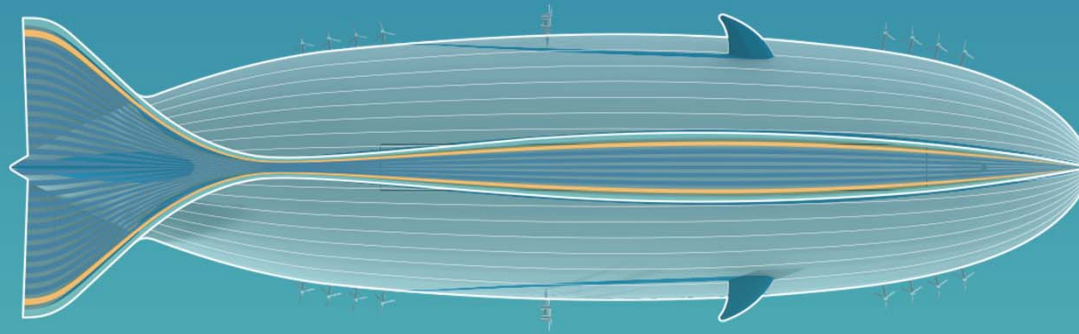
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FLYING CARE Project Manager*

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FLYING WHALES

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THANK YOU



FLYING WHALES is co-financed by
French public "France 2030" program

FLYING WHALES is one of the
French Government's "French Fab" and
"French Tech NEXT40"

