ATR

TURBOPROP MARKET FORECAST 2025–2044

Enhancing regional connections, **enabling global growth**

Preface

“The airline industry has weathered the challenges of the last five years with remarkable resilience.

Amidst the turmoil, in the past and now, regional aviation remains a cornerstone of the air transport network. Turboprops are a lifeline to communities. They are essential in many parts of the world to connect families, businesses and friends swiftly and in an affordable way. They foster economic growth and provide significant societal value.

While aviation faces the imperative of aligning with the Paris Agreement's sustainability goals, demand for air travel remains robust with a forecasted growth in air traffic. Then it becomes crucial to find a balance between making aviation more environmentally sustainable and the aspirations of individuals to continue to fly.

In the regional arena, turboprops are a readily available solution to lower emissions today. They offer the smallest environmental footprint in terms of emissions, operating profitably on short routes. Likewise, turboprops will be the natural entry point for the introduction of new propulsive technologies in the future.

Looking 20 years ahead requires us not only to analyze past trends and current challenges, but also to build the vision for the future of regional aviation.

Nathalie Tarnaud-Laude
Chief Executive Officer, ATR

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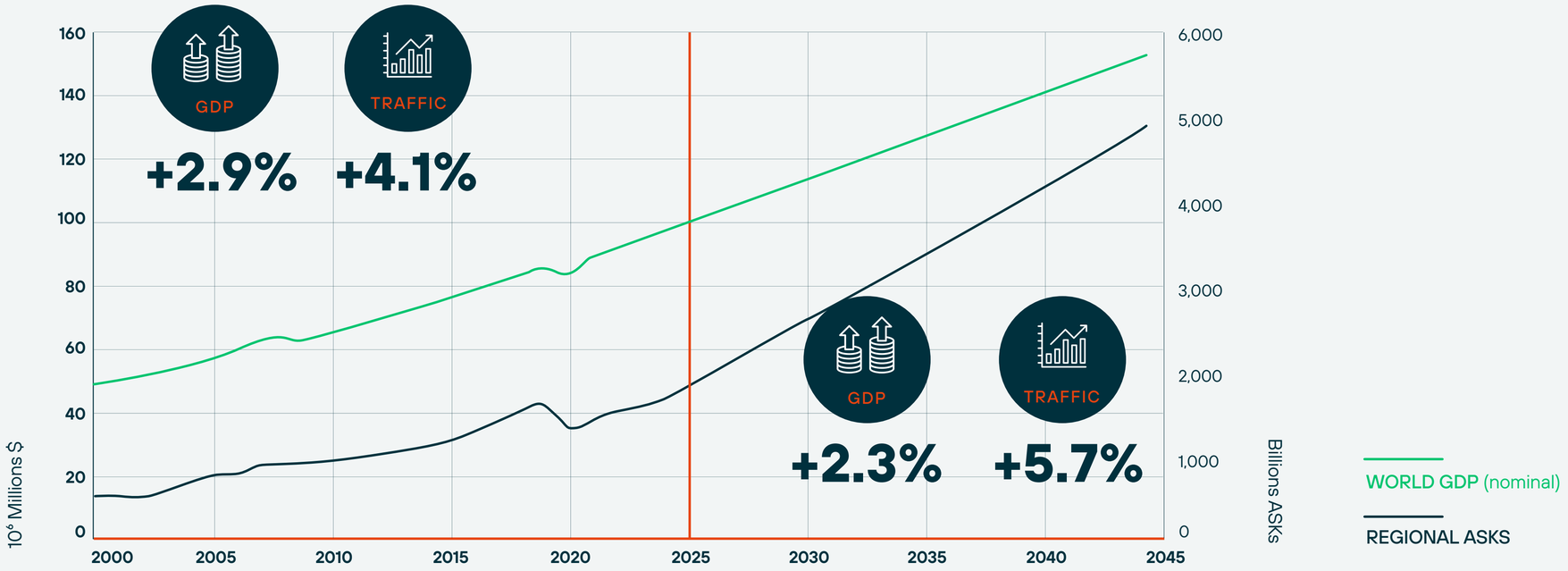
ROUTE CREATION DRIVES GROWTH

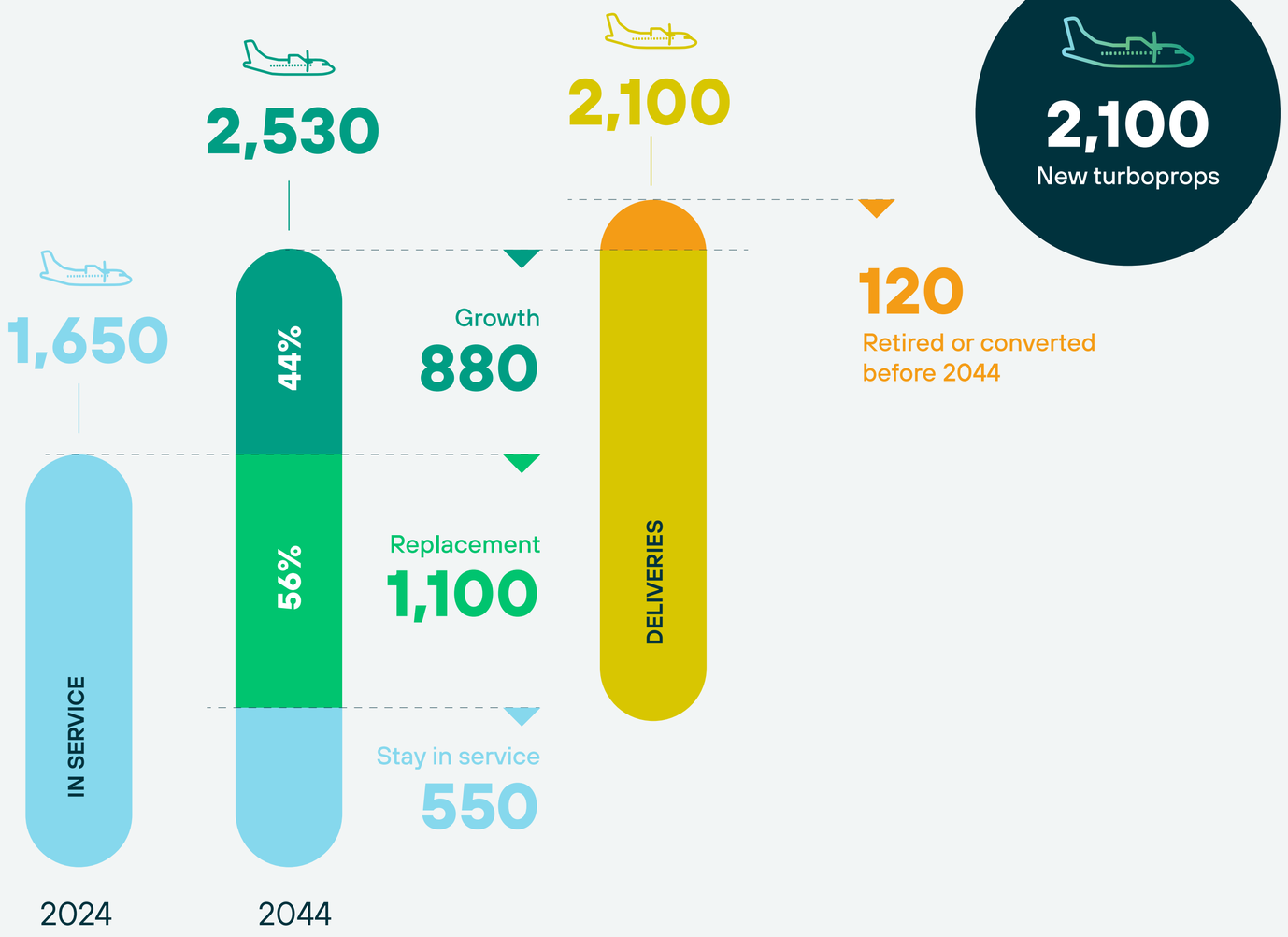


For regional aviation market definition see methodology.

Turboprop demand

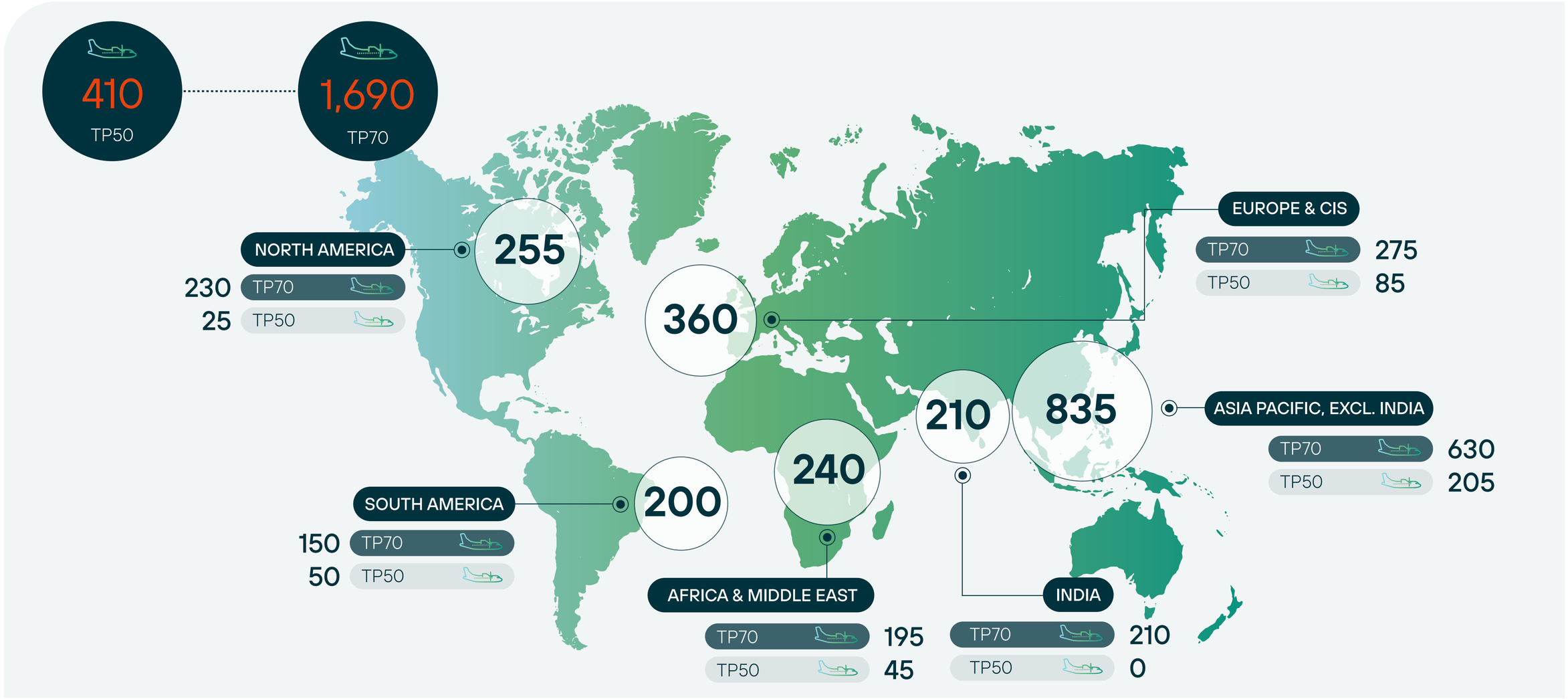
EARLY DELIVERIES FOCUSED ON FLEET REPLACEMENT

- In the next 20 years we expect the global turboprop demand to reach 2,100 aircraft.
- While the airline industry moves on from the challenges of the past five years with strong growth, in the near future we expect the market to remain hampered by both aircraft production constraints across the aerospace sector and an uncertain geopolitical situation.
- In regional aviation, ageing fleets and limited aircraft production have impacted in-service fleets, with more aircraft retiring than entering the market.
- Consequently, turboprop demand in the next 10 years will be primarily focused on aircraft replacement, while the second decade is more oriented towards growth.
- New route creation will be the main impetus pushing the expansion of the turboprop fleet - today and in the future. We expect the fleet to reach 2,530 aircraft by 2044.
- Going forward, fuel prices, emissions taxation and environmental schemes, such as the EU Taxonomy, will reinforce the attractiveness of turboprops as the most affordable and sustainable aircraft to fly regional routes.



Turboprop demand by region

TURBOPROP DELIVERIES



Turboprop demand for new route creation

DEVELOPING MARKETS LEAD NETWORK EXPANSION

37%
of 2044 traffic comes from new routes

+770
aircraft demand to serve new routes

+3,255
new routes created by turboprops

NUMBER OF AIRCRAFT

Asia Pacific, excl. India
305

North America
135

India
105

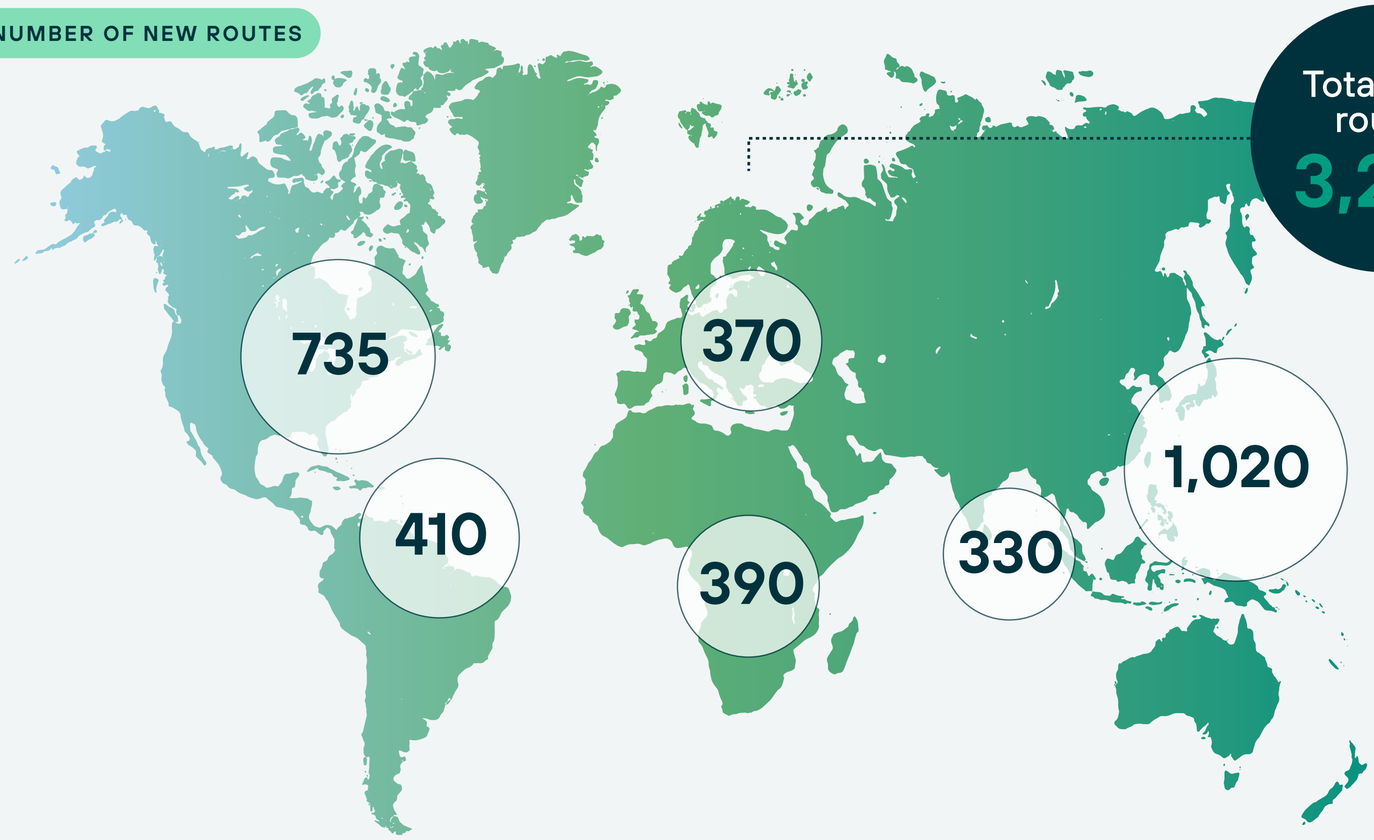
Africa & Middle East
80

Europe & CIS
75

Latin America & Caribbean
70

New turboprop for route creation
770

NUMBER OF NEW ROUTES



Total new routes
3,255

02

Turboprops: **the path to sustainability**

ATR FLIGHTS IN 2024

30,000

ATR busiest airport in Asia Pacific, excl. India

FORT LAUDERDALE **CHRISTCHURCH** – NEW ZEALAND BOG

Decarbonising the regional aviation sector

TURBOPROP TECHNOLOGY OFFERS ROUTE TO CUT EMISSIONS

Regional aviation must play a vital role in helping drive down carbon emissions. Decarbonising the aviation sector, however, is not without its challenges.

In 2024 the industry was presented with the first hurdles to overcome. SAF production levels are below expectations while technological developments are not progressing as rapidly as expected. Moreover, the shifting geopolitical environment brings uncertainties, impacting the necessary investments in carbon reductions.
Crucially, turboprops play an important role helping operators make progress towards lower emissions today. Turboprop technology offers an immediate advantage having proven its effectiveness through decades of operation. Turboprops are an ideal choice for the regional aviation industry seeking to lower carbon emissions in the short-term.

Shifting to a turboprop has the potential to reduce CO_2 emissions by almost 50% compared to flying similar routes in a regional jet. Even greater reductions are possible when jet contrails' impact on the climate is taken into account.

Reducing emissions in regional aviation is vital to help the overall aviation sector tackle climate challenges. Likewise regional aviation is a vital lifeline to local communities. In peripheral regions it provides access to essential services like healthcare and education, job opportunities and a connection to the global economy.

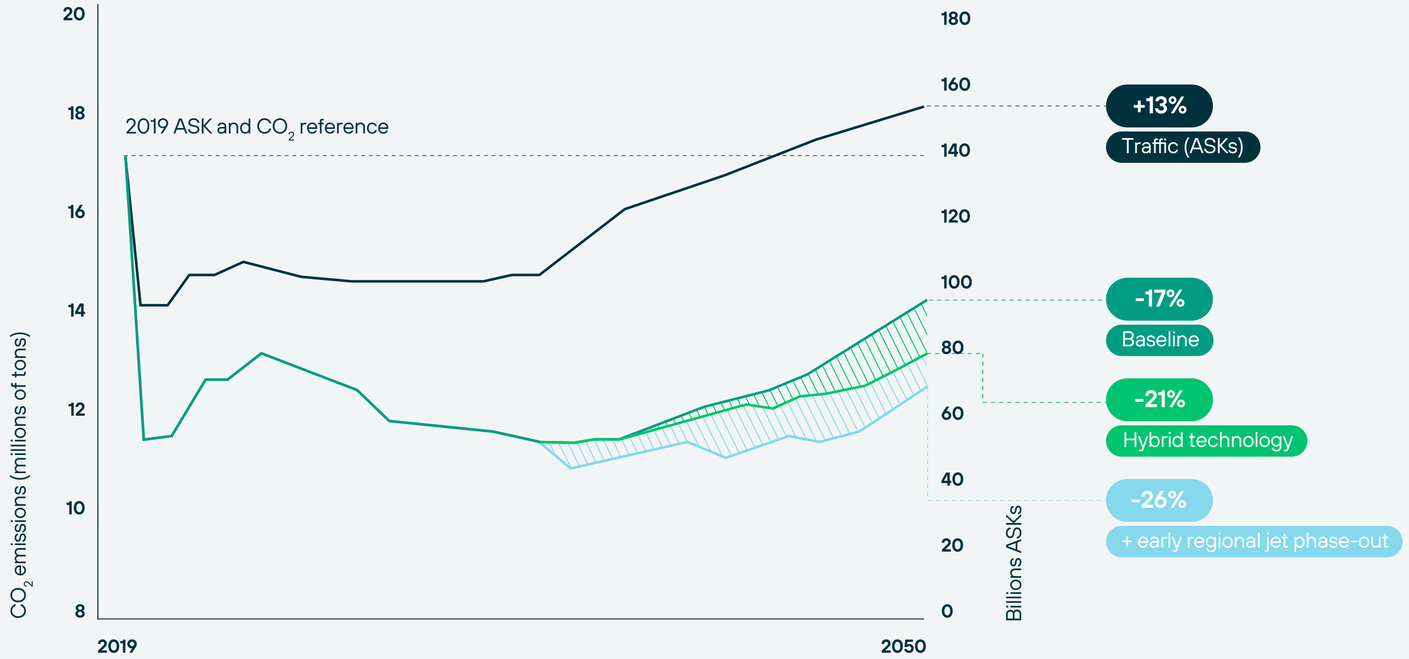
Turboprops play an important role on this journey to decarbonisation starting today.

Turboprops will be essential to decarbonising regional aviation

SIGNIFICANT CO_2 REDUCTIONS ACHIEVED USING PROVEN TECHNOLOGY

- The regional market typically operates with two types of aircraft technologies: turboprops or regional jets. Many regional jet programmes have been stopped in the past decade and this natural shift to turboprops is an opportunity to significantly reduce regional aviation's CO_2 emissions.
- Turboprops achieve a 17% decrease in absolute emissions based on a proven technology, without the use of SAF*. This impressive performance is attained with aircraft technology only, while maintaining traffic growth.
- With the introduction of hybrid engines around the second half of next decade, turboprop technology will increase the reduction in CO_2 emissions to -21%.
- Factoring in an early phase-out of regional jets, driven by regulatory constraints, total CO_2 emissions saving could reach –26%.

Regional aviation global emissions and traffic projection up to 2050



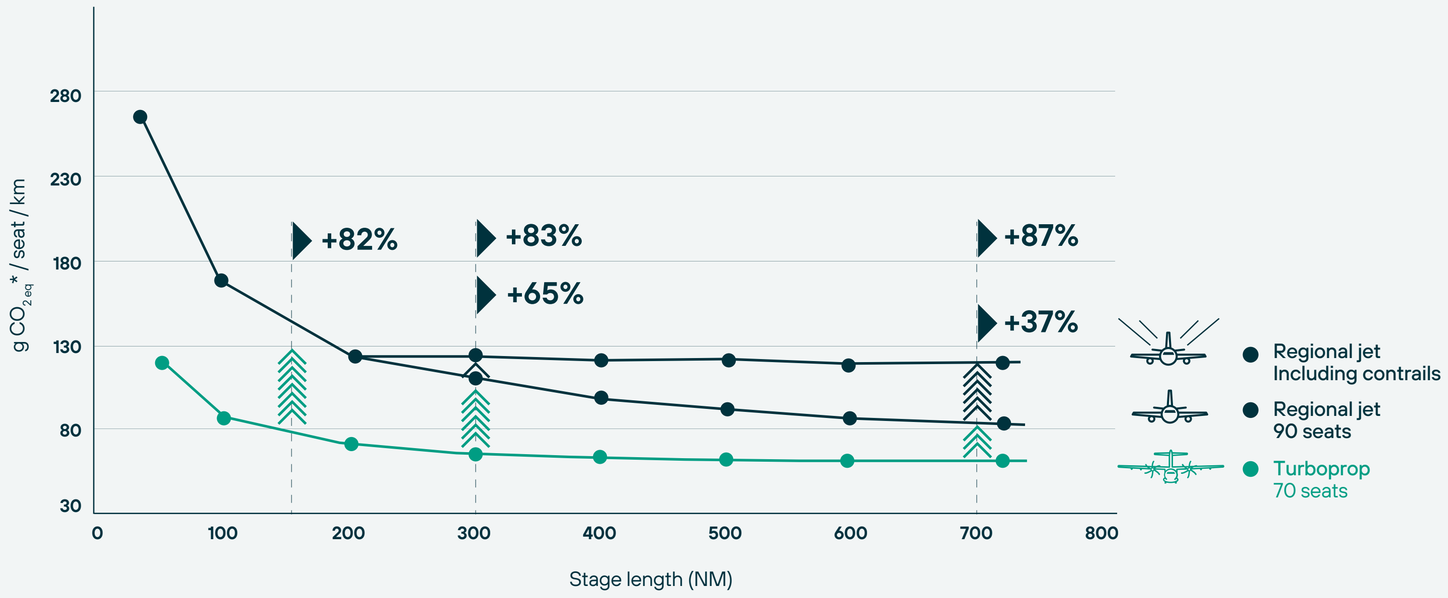
*Sustainable Aviation Fuel.
Regional jets up to 90 seats and turboprops ASK, distance up to 500NM.

Turboprops limit climate impact on regional routes

IMPACT SIGNIFICANTLY LOWER WHATEVER THE DISTANCE

- Regional jets emit more CO_2 than turboprops and their fuel inefficiency is even higher on routes below 200NM, as jet engine technology is not optimised for such short flights.
- Beyond CO_2 emissions, contrails formed by jets also have a warming effect on the climate, which can be estimated in a CO_2 equivalent metric: CO_{2eq}.
- Taking this into account means that any CO_2 efficiencies created on long-haul jet flights will be cancelled by the increasing effect of contrails on longer flights.
- As a result, the overall climate impact of jets plateaus instead of going down, when considering pure CO_2 emissions effect only.

Global climate impact by stage length



*CO_2 equivalent considering Global Warming Potential over 100 years.

Deep-dive on contrail effects

TURBOPROPS REDUCE GLOBAL CLIMATE IMPACT EVEN FURTHER

- Contrails are the second biggest contributor to the climate impact of aviation, behind CO_2. Current best estimates quantify contrails as adding 30% to aviation's CO_2 effect globally.[1]
- But the contrail effect is not evenly distributed. Only around 5% of global flights produce all of contrails' climate impact.
- With lower cruising altitudes and day-flight conditions regional aviation is less prone to forming contrails.
- Within regional aviation, however, not all aircraft operate equally. Regional jets flying at higher altitudes are more likely to form contrails, while turboprops which fly lower are not.
- This reality means turboprops have been exempted from airlines' contrails monitoring obligation that started in January 2025 in Europe.

CASE STUDY

The effects of contrails are best shown by comparing two regional airlines in Northern Europe – one operates a fleet of regional jets and the other a fleet of turboprops.

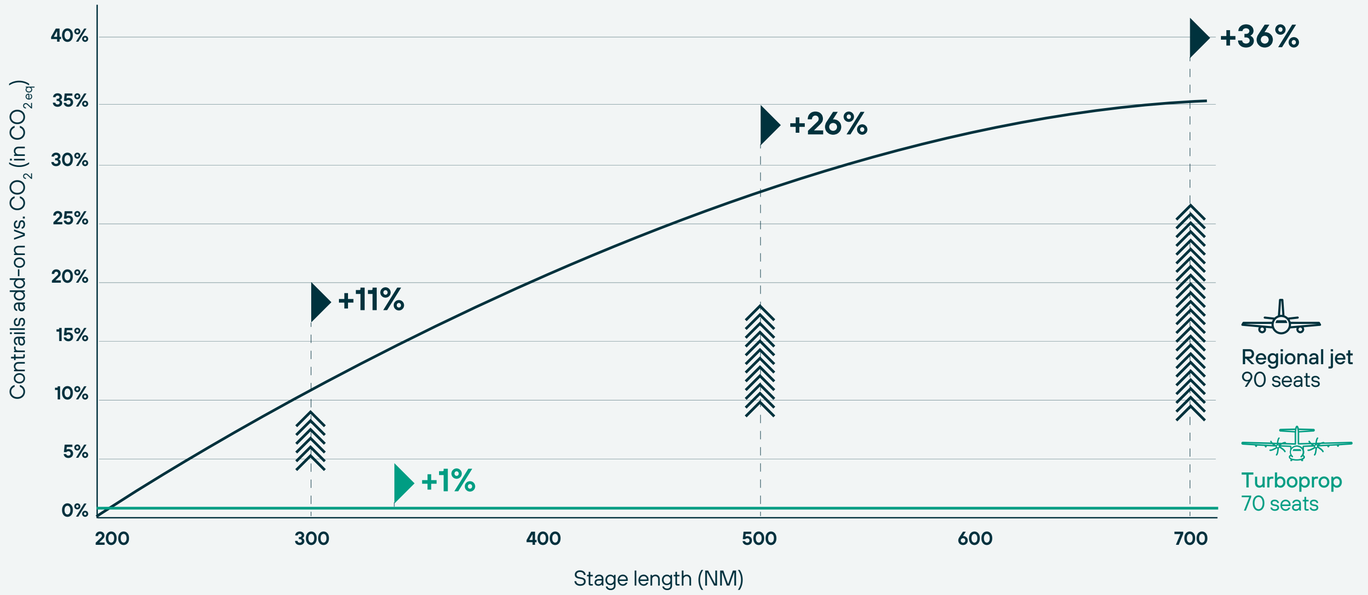
Regional Jet Operator

Contrails add-on is 18% across all flights, although is dependent on flight length, e.g., longer flights increase time spent at altitude.

VS

Turboprop Operator

Contrails only add-on 1% and remain stable even for longer flights.

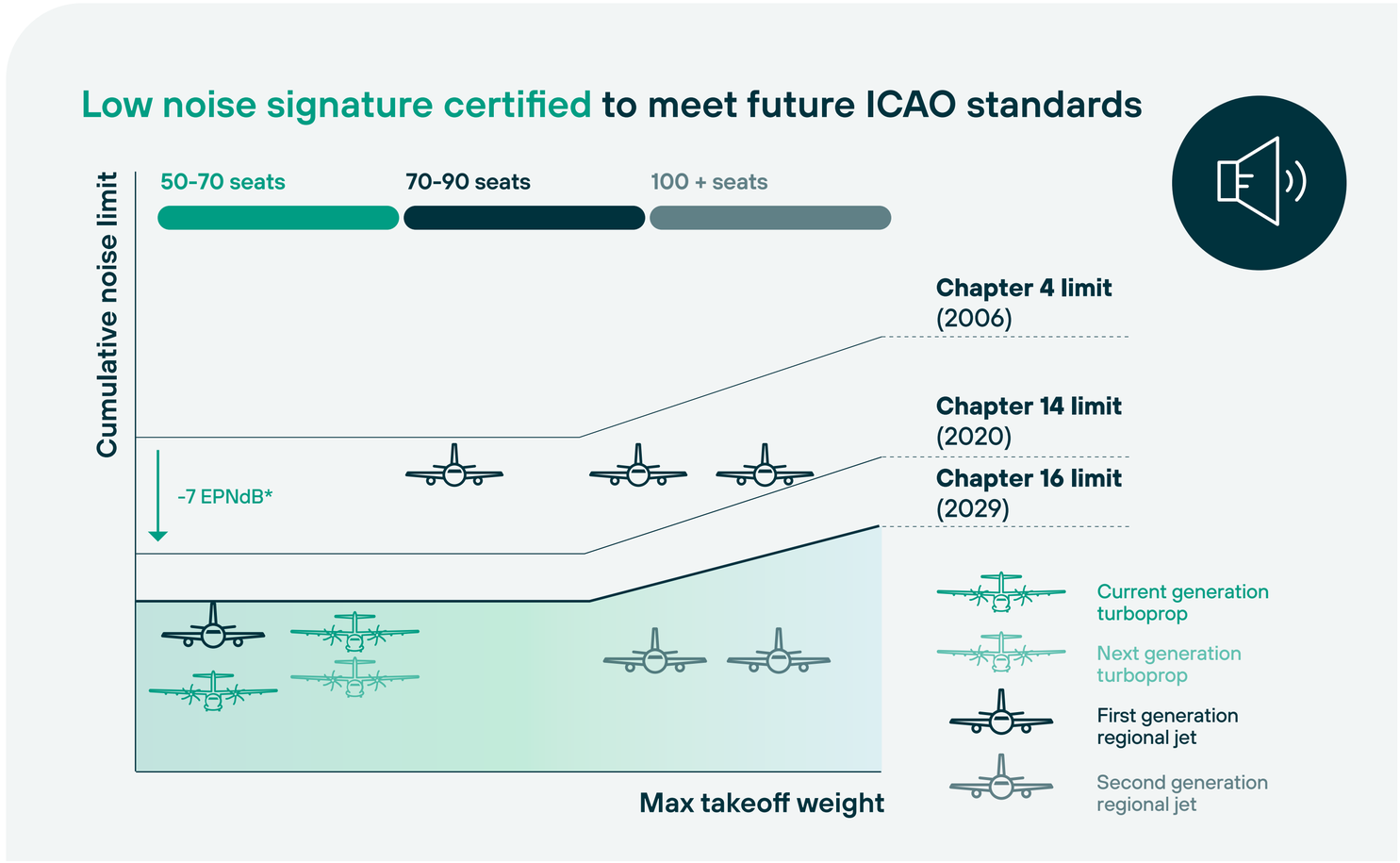


[1]Analysis based on Teoh et al. (2024). Global aviation contrail climate effects from 2019 to 2021.

Turboprops already aligned with future stringent noise regulations

ENABLING MORE RESPONSIBLE, FUTURE-PROOFED OPERATIONS

- Environmental noise regulations are also getting more and more stringent. With their remarkably low noise signature, turboprops are the benchmark with a strong performance compared to the 2020 ICAO standards, with a sufficient margin to fall within EU taxonomy criteria.
- Turboprops' low noise footprint allows operations at airports located in city centres which impose strict sound levels, such as London, Belfast or Toronto City airports. As a result, turboprops reduce airport fares designed to tax loud aircraft, further reducing operator costs.
- Turboprops' low noise and low emissions performance also contribute to the environmental credentials of ecologically sensitive regions, such as Amami Islands in Japan, New Caledonia and Tahiti, helping preserve the unspoilt beauty of remote, natural locations.



*Effective Perceived Noise in decibels.

Airlines facing rising environmental costs

TURBOPROPS EVEN MORE COST EFFICIENT IN CARBON-CONSTRAINED MARKETS

- Environmental costs are getting higher for operators as regulations, airlines and investor commitments progress towards Net Zero.
- SAF* mandates are pushing to higher SAF incorporation levels, while carbon taxes are expanding and increasing. Europe has just started monitoring aviation contrails - something it could, ultimately, transform into taxation.
- At local levels, airports are expected to reduce noise and improve air quality - and consequently make polluting aircraft operators pay higher fares.
- Turboprops, with their combination of low CO_2 emissions, fewer contrails, reduced noise footprint and low nitrogenous oxide emissions are least affected by the increasing environmental costs and better positioned to adapt in an evolving market.
- In this context, turboprops could help accelerate the replacement of regional jets as they become more costly and more uneconomic.

Extra environmental operating costs per seat

2035 cost projections in Europe

*Sustainable Aviation Fuel

Assumptions: sector 300 NM, EU-ETS 160€/t, SAF price 2$/kg 20% blend, kerosene 1$/kg, contrails +15% CO_{2e} on jet aircraft, airport Nox & noise taxes.

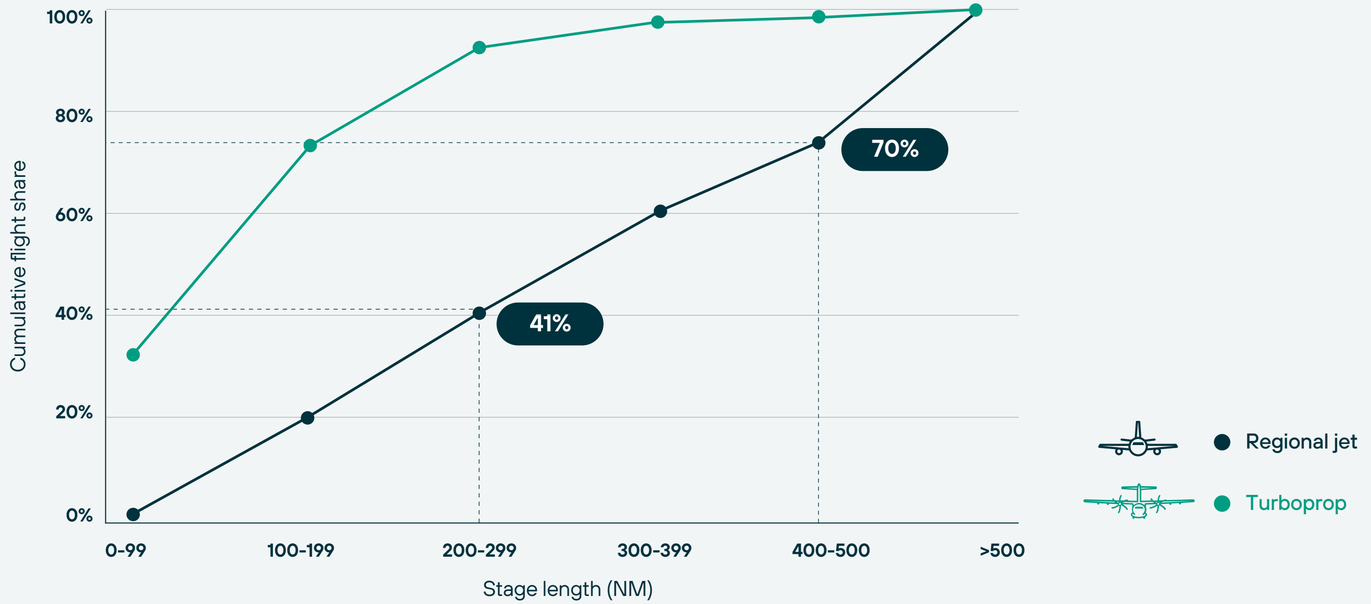
Turboprops offer immediate decarbonisation opportunities

POSITIVE IMPACT ON CO_2 REDUCTIONS RAPIDLY AVAILABLE

- The additional opportunity created by turboprops is the fact they can play an immediate role in decarbonising regional aviation due to their engine technology available now.
- Crucially, 41% of regional jet flights are below 300NM and could be easily replaced by turboprops. In turn this would deliver significant reductions in emissions while ensuring minimum increases in flight time.
- In fact replacing regional jets flights on stage lengths up to 500NM will deliver substantial reductions in emissions, which represents 70% of the regional jet flights.

Over 40% of regional jet flights can be replaced by lower emission turboprop aircraft today.

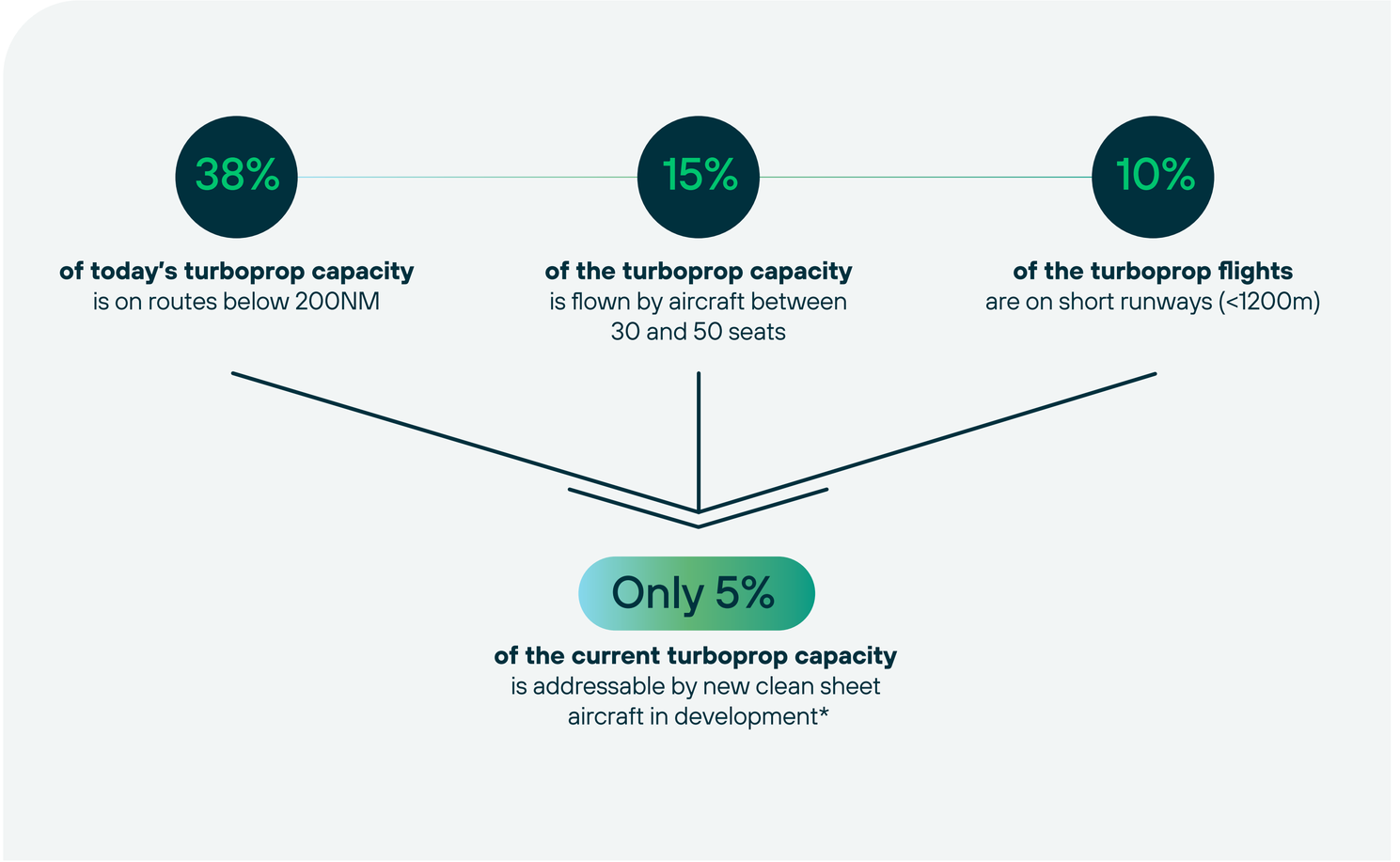
Cumulative flight distribution by stage length



New aircraft in development offer potential

BUT WILL ONLY ADDRESS A LIMITED PORTION OF THE CURRENT TURBOPROP MARKET

- Turboprop developments in the pipeline offer further opportunities for reducing emissions, however they can't address a large portion of the current turboprop network.
- Clean sheet hybrid electric aircraft designs have ranges of around 200NM and mostly fly 50 passengers or less. In extreme cold conditions, such as found in Canada or the Nordics, battery performance can pose a challenge. Additionally, battery weight can reduce performance on short runways. In busy airports, such as Athens or the Canary Islands, operating smaller capacity aircraft rather than larger turboprops, will require double the number of flights to provide the same traffic level, adding to airfield capacity issues.
- Hydrogen fuel cell technologies and hydrogen burn offer a promising alternative solution in tackling carbon emissions, although these technologies are only anticipated in the distant future.



*Based on public design criteria of clean sheet turboprop developments in the pipeline.

Calvi Sainte-Catherine Airport – Corsica

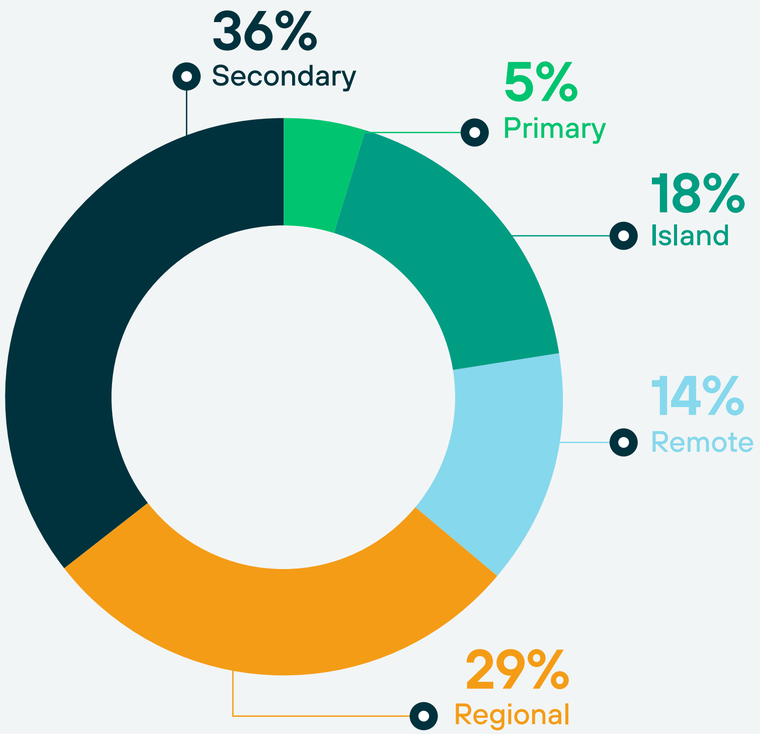
The social role of regional aviation

TURBOPROPS ARE RELEVANT TO PROVIDE ESSENTIAL CONNECTIVITY

A third of turboprop traffic is deployed on peripheral regions, with no other viable means of transport.

- Regional aviation's contribution to positive social effects is widely recognised, but rarely quantified as part of ESG (Environmental Social Governance) metrics. The upcoming analysis demonstrates through academic research and practical examples how regional aviation promotes regional cohesion, provides vital access to healthcare and education as well as the labour market.
- Turboprops reach where other modes of transport cannot due to their outstanding performance on short runways and in challenging terrain. As a result air accessibility is the most efficient means of reducing detrimental impacts of isolation, e.g. limited access to public services and consumer goods, and high living costs.[2]
- It also enables peripheral regions to benefit from productivity improvements associated with greater connections and provides access to global markets, including trade, tourism, investment, and labour.[3]

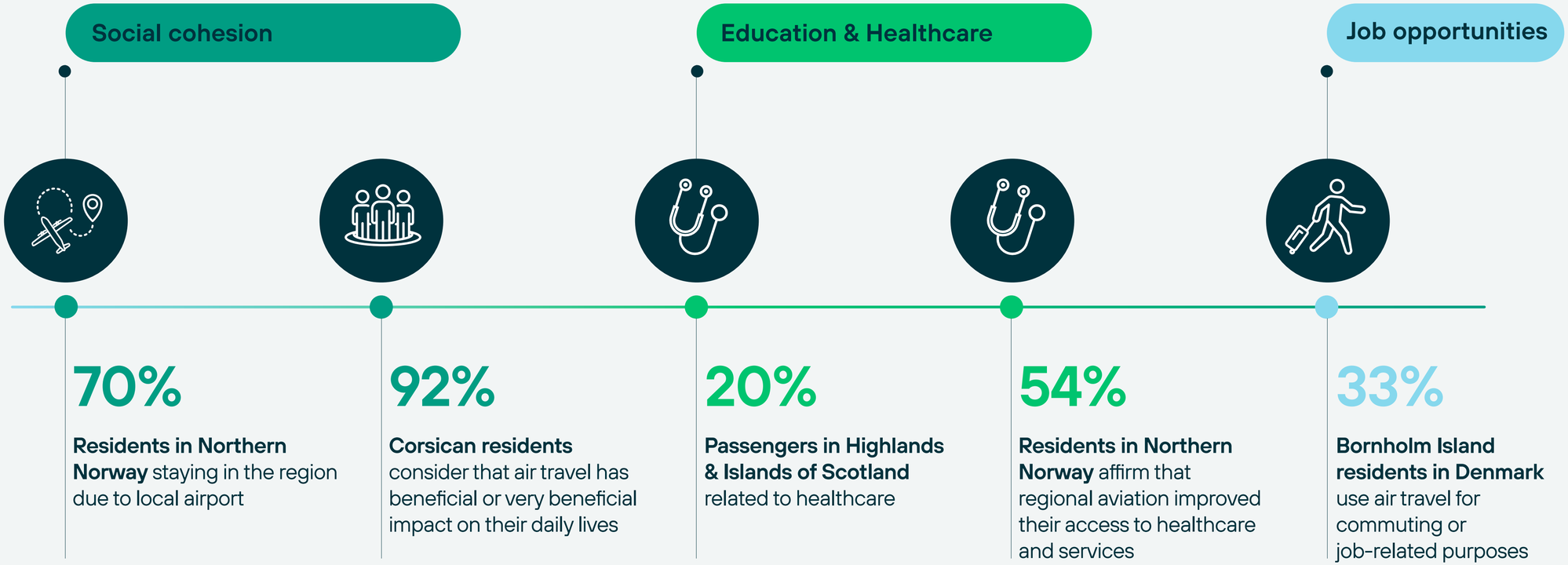
Distribution of turboprop traffic by airport category (%ASK)



[2]Metrass-Mendes et al, 2011
[3]Mukkala & Tervo, 2013

Proving the social value of regional aviation

CASE STUDY: EUROPE



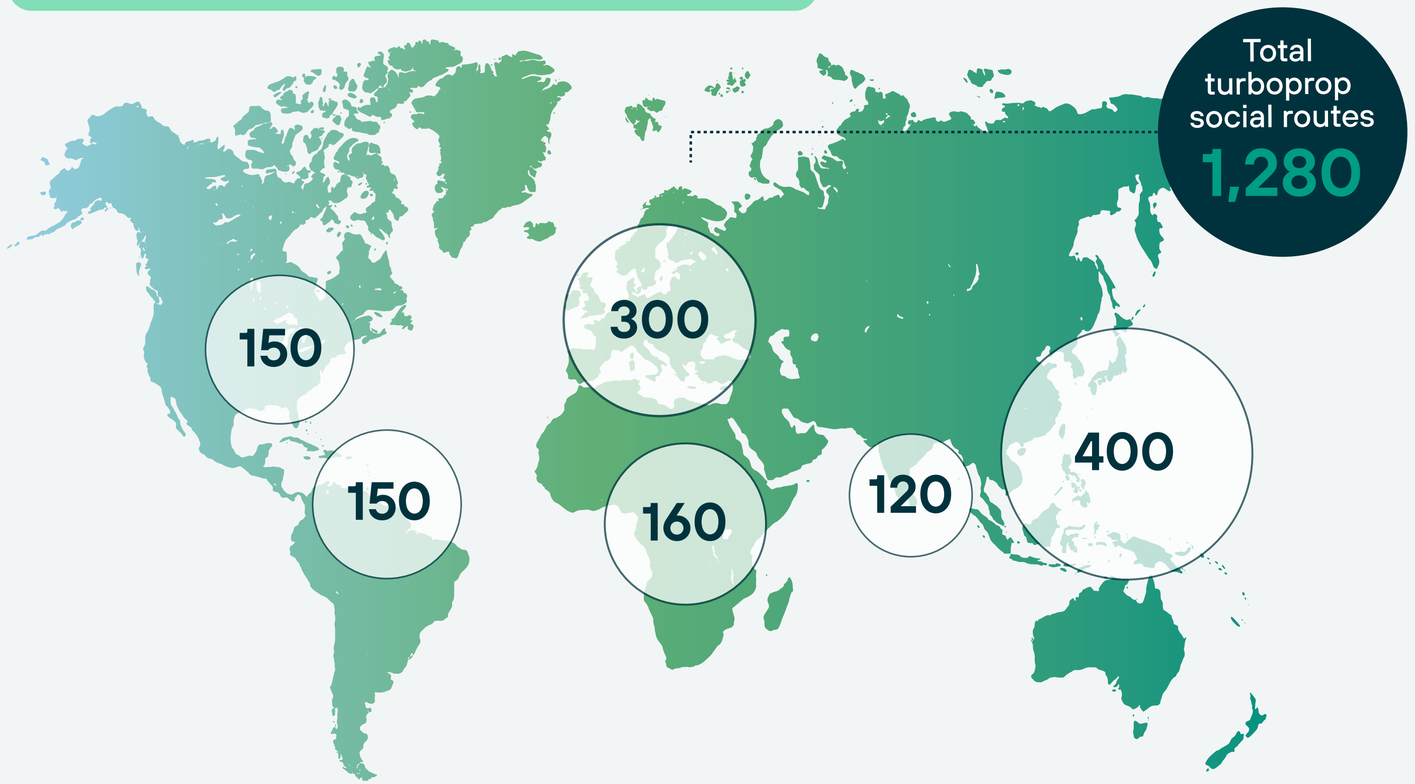
Source: ERA - *The Economic, Social and Environmental Impact of Regional Airlines in Europe.*

50% of the turboprop routes serve a social role

80% of the Public Service Obligation Flights in the European Union are flown by turboprops.

- Many routes that have a marked social impact connect remote cities and outlying archipelagos. These routes demand frequent and affordable flights.
- The beneficial economics of operating turboprops and the aircraft size make them the perfect fit.
- For a minority of routes, governments recognize the public utility of air transport, subsidizing routes or airlines.
- In the European Union, for example, there are 190 Public Service Obligation routes. They represent 5% of all aircraft departures and 80% are flown by turboprops.
- In India, a decade ago the government launched the UDAN scheme promoting new routes connecting secondary and tertiary cities. Traffic between secondary cities successfully grew at a rate of 15% per annum, with 36% of the UDAN routes operated by turboprops.

NUMBER OF TURBOPROP SOCIAL ROUTES OPERATED GLOBALLY



Source: ATR - *S for Social Analysis.*

03

Driving growth through **regional connectivity**

ATR FLIGHTS IN 2024

16,000

ATR busiest airport in Africa & Middle East

Connecting local communities

REGIONAL AVIATION FOSTERS ECONOMIC DEVELOPMENT AND TERRITORIAL COHESION

In a hyperconnected world people seek real interactions to reconnect with our human nature more than ever.
Connecting communities is important to facilitate trade and propel economic development, but also to ensure that communities in remote regions are not left behind.

Regional aviation has a relevant role to ensure families, businesses and friends stay in touch, providing a safe and affordable option to bring people together no matter how isolated.

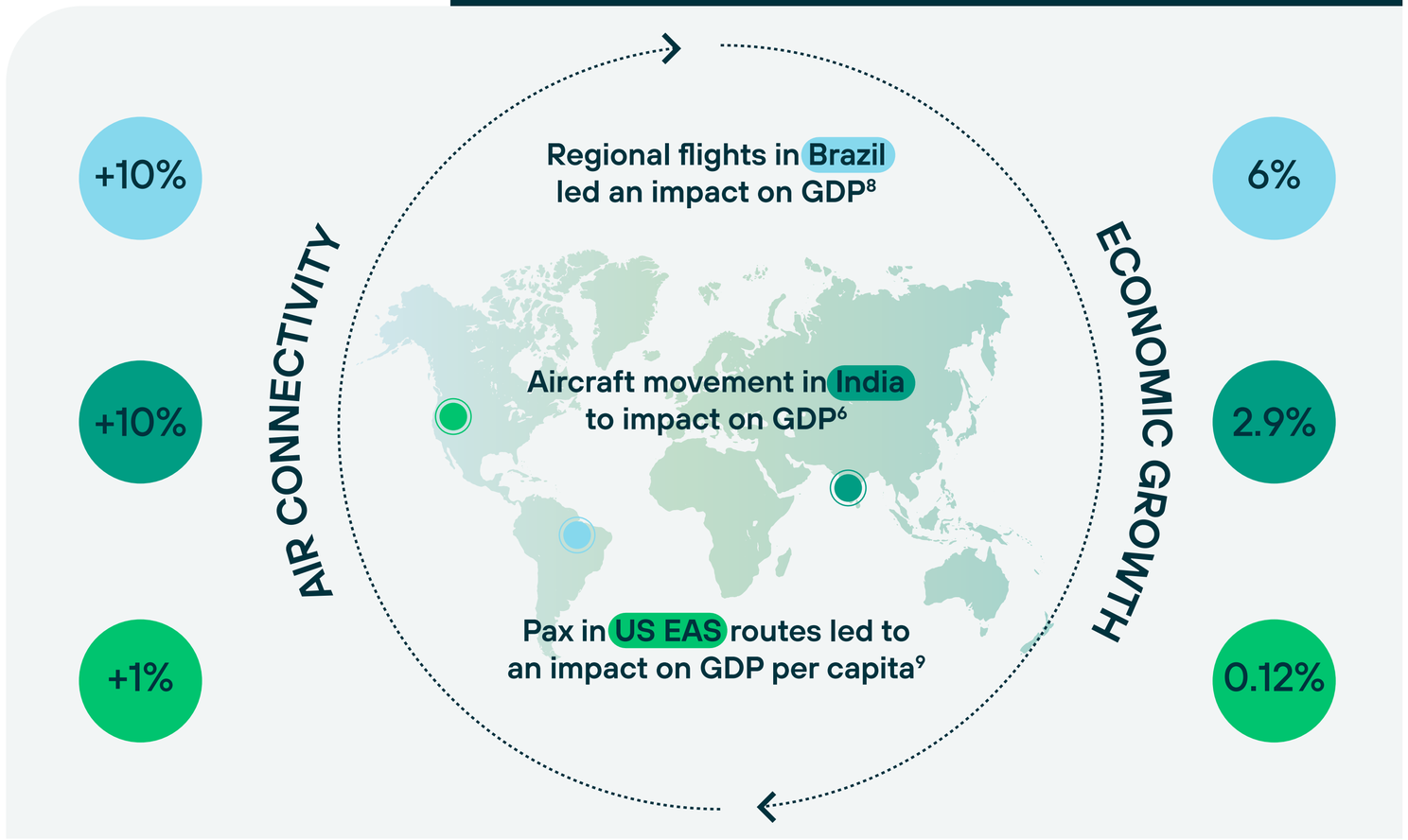
→ Watch this video to learn more about how turboprops benefit local communities in the island of Flores, Indonesia

Regional aviation boosts local economies

CONNECTING REMOTE REGIONS HAS A BENEFICIAL MULTIPLIER EFFECT

There is **causality from air traffic to regional growth** in peripheral regions.

- Air transport facilitates tourism and trade, provides jobs, generates economic growth and improves living standards. In 2024 alone air transport supported 86.5 million jobs worldwide and generated $4.1 trillion of global economic impact.[4]
- Regional aviation specifically can have an amplifying effect on countries' growth, depending on the state of development and its pre-existing transport links. The rate at which regions develop depends to a large extent on the quality of their connectivity, actually regional air transport plays a prominent role in territorial cohesion.[5] Additionally, the causality from air traffic to regional growth has been demonstrated for peripheral regions.[6]
- Regional airports stand out as a multiplier of the economy, by providing access and facilitating business and services (including tourism) in geographically isolated or hard-to-access communities, thus improving their quality of life.[7]



[4]ATAG, Aviation: Benefits Beyond Borders
[5]European Committee of the Regions
[6]Mishra et al, 2021
[7]Salgado & Oliveira, 2008

[8]Chiambaretto, 2016
[9]Ozacan, 2014b

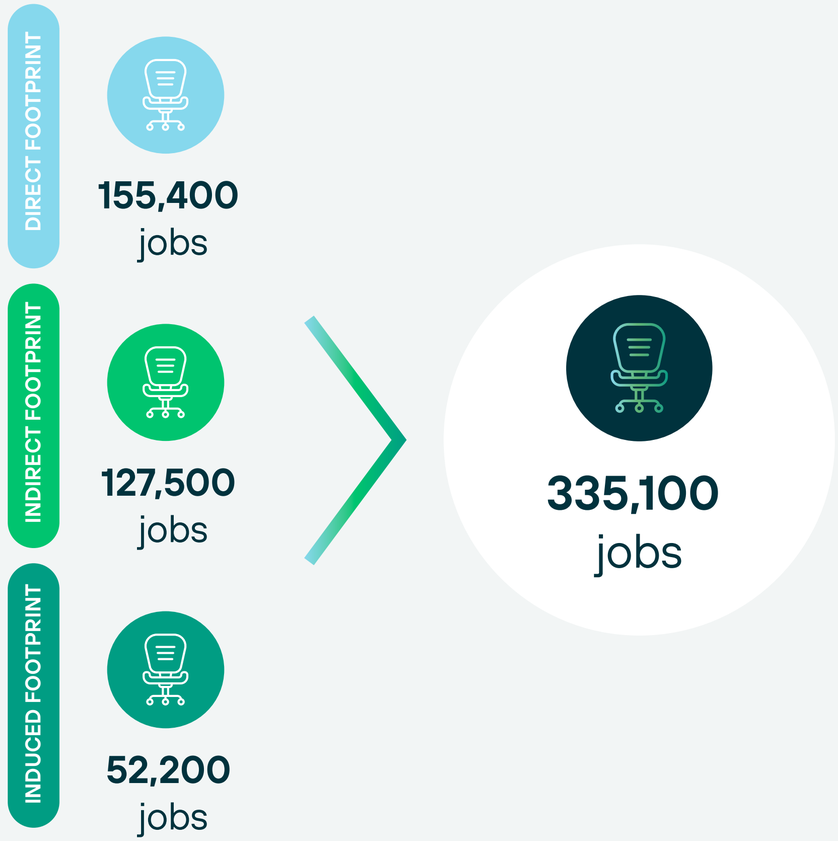
The economic footprint of regional air transport

CASE STUDY: EUROPE

- In Europe the economic benefits of regional aviation have been quantified at 335,000 jobs and €23bn in Gross Value Added (GVA).
- Adding catalytic effects, the economic footprint of tourism enabled by regional aviation in Europe is 4.5 million jobs and €205bn in GVA.
- Crucially, it is in the outermost regions where the impact of aviation is more significant. For example, regional aviation enables 25% of the total tourism-related employment in Greece and 60% in Norway.

Regional aviation driving €23.1bn in Gross Value Added to the economy in Europe.

Economic footprint of regional air transport in Europe



Source: ERA - *The Economic, Social and Environmental Impact of Regional Airlines in Europe.*

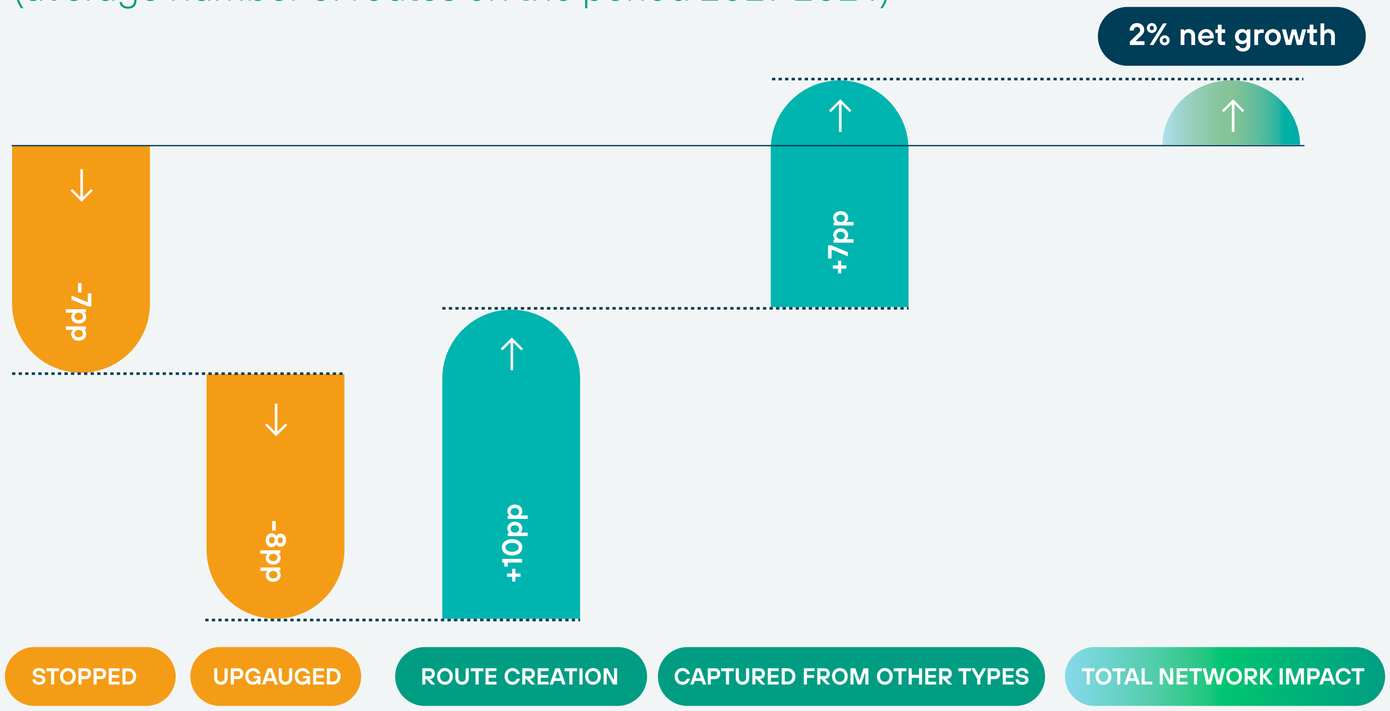
The role of route creation in network dynamics

TURBOPROPS PLAY AN ESSENTIAL ROLE

- Over the past 20 years, 36% of turboprop network expansion has been driven by the creation of new routes – which, in turn, enhances regional and global connectivity and stimulates economic activity.
- By acting as route openers, turboprops identify, test and establish new connections with limited commercial risk. This is often followed by upgauging, where capacity is increased to accommodate rising demand. On average, 30% of routes are upgauged to bigger modules.
- Turboprop's network remains dynamic and continuously evolving. This constant renewal reflects – and rewards – airlines' adaptability and ambition to explore new markets.

150 new routes are created by turboprops every year.

Turboprop network dynamic
(average number of routes on the period 2021-2024)



Enhanced connectivity will create meaningful benefits for communities

CASE STUDY: AFRICA

Regional hubs are operating below their ideal connectivity potential.

- From an economic perspective, airport connectivity plays a crucial role in shaping a region's business landscape and investment appeal.
- Efficient air links promote trade, facilitate business travel and foster expansion of knowledge-driven industries that thrive on global accessibility. For tourism-dependent areas, strong air connectivity is essential for sustaining visitor inflows.
- Africa's aviation sector is experiencing a major shift, fueled by a rising middle class, the liberalisation efforts of the Single African Air Transport Market (SAATM), and expanding regional trade.

Significant opportunities in the African turboprop market

300+
African city pairs remain without direct flights despite strong demand

40%
of key African city pairs lack direct air links

60%
of potential intra-African routes would be best served by 70-seater or smaller aircraft

Supported by Milanamos REACH Index™ and insights.

Restoring connectivity in the US

CASE STUDY: US REGIONAL NETWORK

3.6 million passengers impacted by the lack of connectivity in former midwest hubs.

- Since 2000 the regional aviation network in the United States of America has shrunk due to the widespread adoption of regional jet fleets. This is despite jets' inefficient economic performance at low stage lengths.
- This gradual reduction of services has become more pronounced in the past five years, due to retirement of small regional jets.
- Heavily populated cities in the midwest, such as Cleveland, Cincinnati, Memphis or Pittsburgh, have seen a drastic decrease in connectivity. This pushes local populations to travel by air with multiple connections or long drives to reach nearby cities.
- Turboprops are a readily available solution to restore connectivity across the US. These aircraft are compliant with pilot scope clause agreements. Moreover, their advantageous economics on short routes and lower seat counts ensures discontinued routes can be operated profitably again.

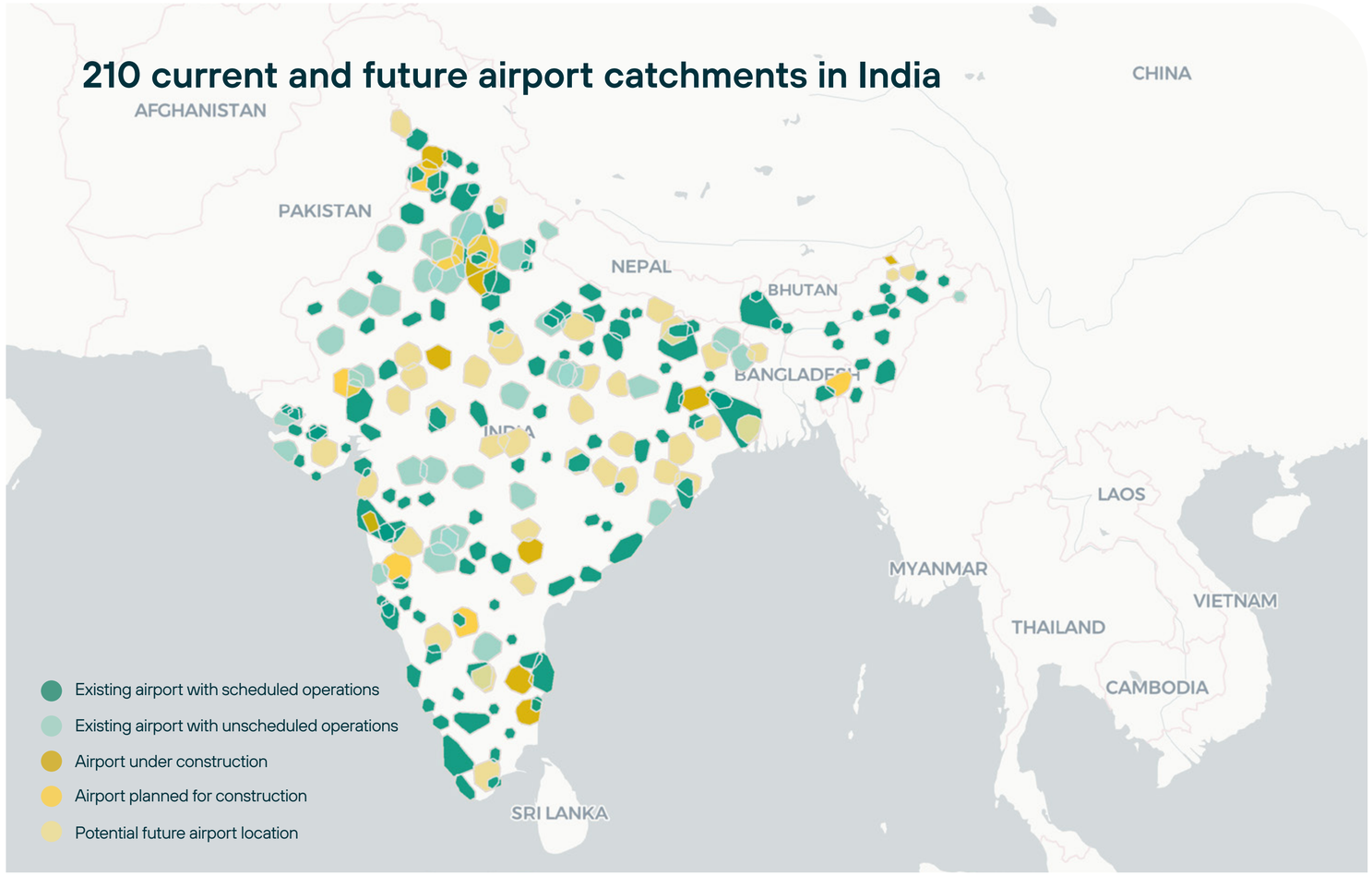
800 routes lost since 2000

Source: OAG and Seabury Airline Strategy Group analysis for ATR, sector length below 500NM.

300 million more Indians to access air travel by 2030

CASE STUDY: REGIONAL MOBILITY IN INDIA

- The Indian government has made great strides over the last decade to bring air travel within the reach of an ever-growing section of the country's population.
- The number of operational airports in India has more than doubled since 2015 and this total is expected to double again by 2030 to over 200 airports.
- This planned expansion could provide an additional 300 million people with local access to air transport, bringing the total to more than one billion potential passengers.
- Such a vast increase in convenient access to air transport will necessarily strengthen the share of the regional aviation sector in the overall Indian travel market.

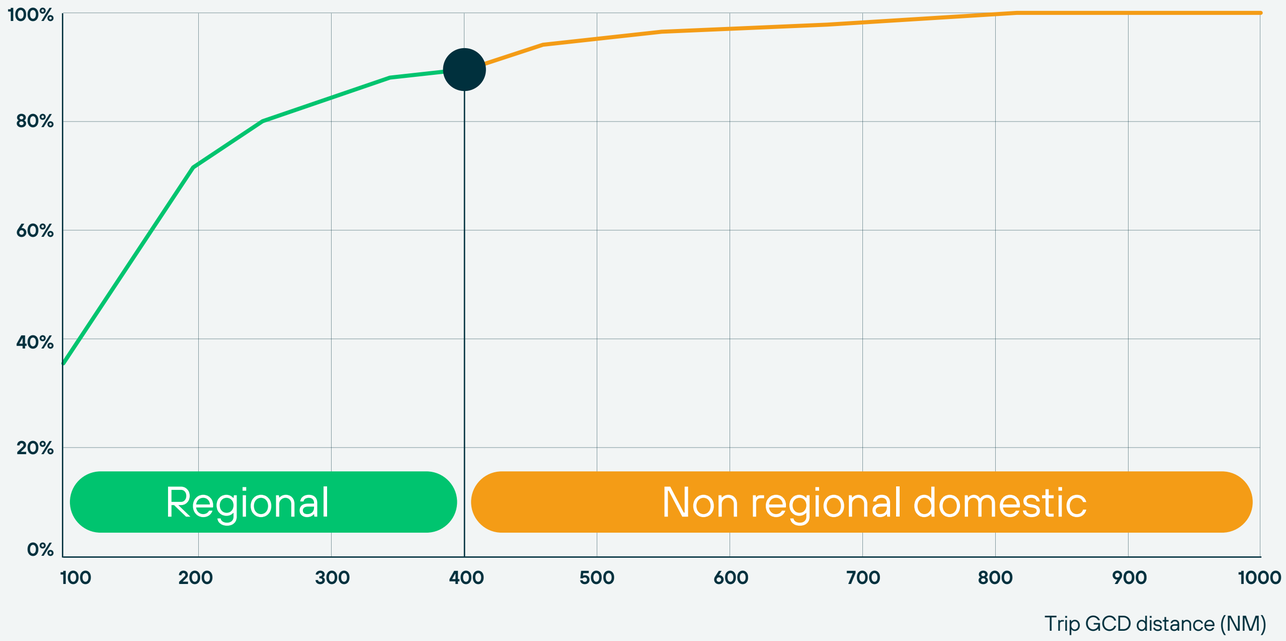


90% of Indian inter-city trips across all transport modes are below 400NM

CASE STUDY: REGIONAL MOBILITY IN INDIA

- Regardless of the mode of transport chosen by Indian travellers, an important feature of the country's travel market is the fact that the vast majority of inter-city trips are within the usual operating range of turboprop aircraft.
- At a national level, however, the proportion of trips completed by air is only half that of more developed economies. This indicates significant growth potential as more travellers access the air transport system.
- Analysis of journeys made by a sample of 20 million Indian travellers including planned airport developments, estimates that there is potential for 380 regional new city pairs. This represents a network increase of 150%.

Cumulative distribution of Indian inter-city trips



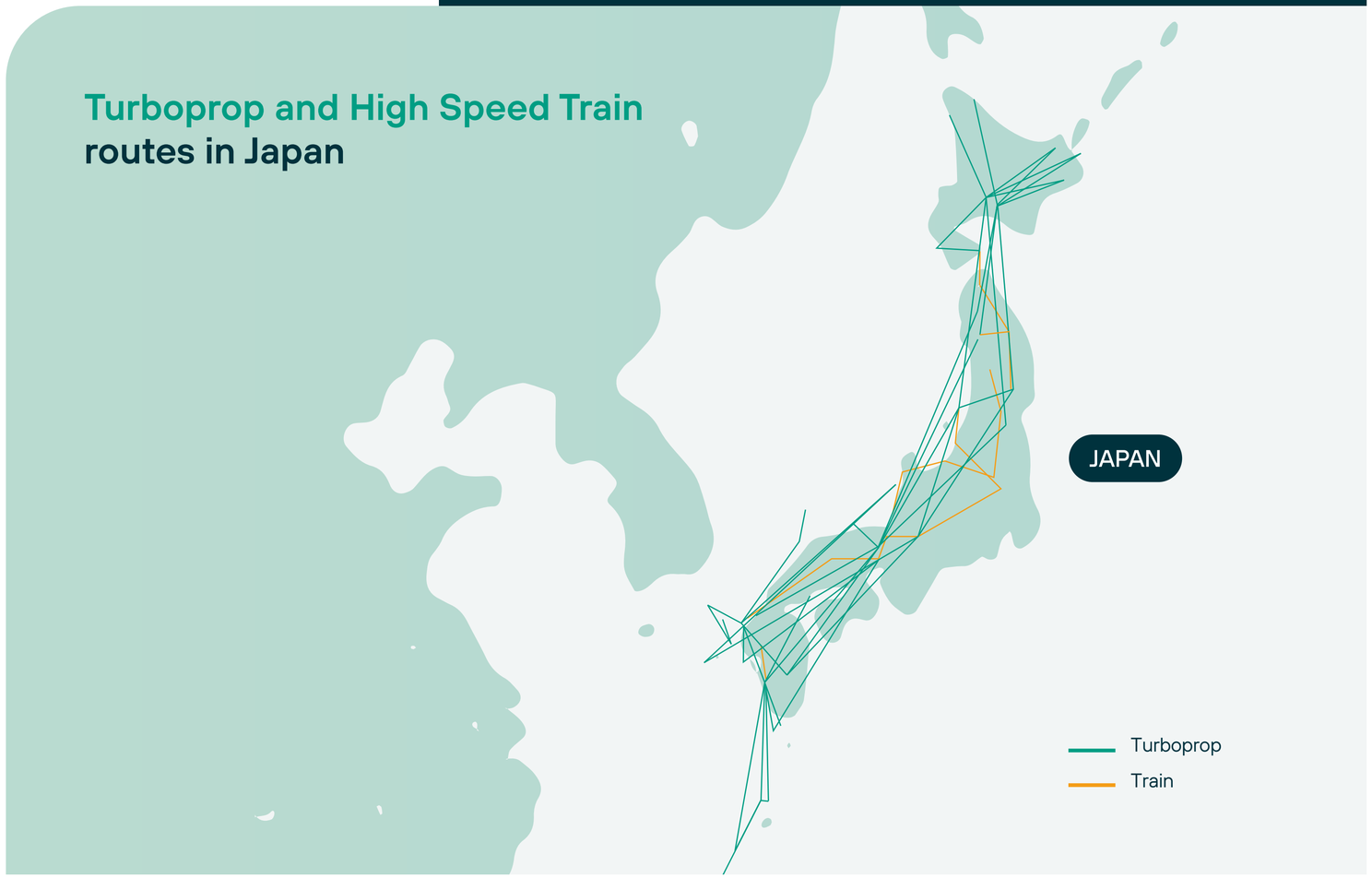
Regional aviation complements train travel

CASE STUDY: JAPAN

- While Japan has a highly developed HST (High Speed Train) network, it doesn't directly compete with turboprop air services, as they serve different travel demands. In Japan high-speed trains cater to routes with significantly larger passenger volumes, whereas the busiest mainland turboprop route sees fewer than 350,000 passengers annually.
- Over half (57%) of the routes served by turboprops are either inaccessible by rail or would involve prohibitively long road travel - particularly in island regions or areas with challenging mountainous terrain. In contrast, Japan's high-speed rail network primarily links the country's major metropolitan areas.
- With only three overlapping routes—accounting for just 1% of turboprop capacity—turboprops play a crucial role in maintaining connectivity between the mainland and peripheral regions. Rather than competing with high-speed trains, turboprops serve as a complementary mode of transport.

57% of the routes flown by turboprops in Japan don't have a viable alternative by train or by road.

Turboprop and High Speed Train routes in Japan



Regional aviation is the most cost-effective solution for low traffic flows

COMPARATIVE COST OF INFRASTRUCTURE IN INDONESIA AND INDIA

- Regional aviation is the optimal solution to address domestic transport needs in sparsely populated areas and complex geographies, as these render train and road development uneconomical.
- Comparing new infrastructure build costs over the past 15 years illustrates how regional aviation is a cost-effective way to develop transport links fast and affordably. For example, the cost of ground infrastructure can vary widely depending on local topography, e.g. for the Jakarta-Bandung HST in Indonesia.
- Generally, High Speed Train lines are designed for traffic flows over 1 million passengers per annum, while regional aviation competes in a different segment where traffic flows are much lower. Only 3% of the turboprop routes operate more than 300,000 seats per annum, and those busy routes mostly link islands.

	Cost of regional airport	High Speed Train (300km)	Highway Road (300km)
INDONESIA 	$32M	240x more investment than building two regional airports	8x more investment than building two regional airports
INDIA 	$62M	35x more investment than building two regional airports	6x more investment than building two regional airports

Turboprops offer dynamic market flows

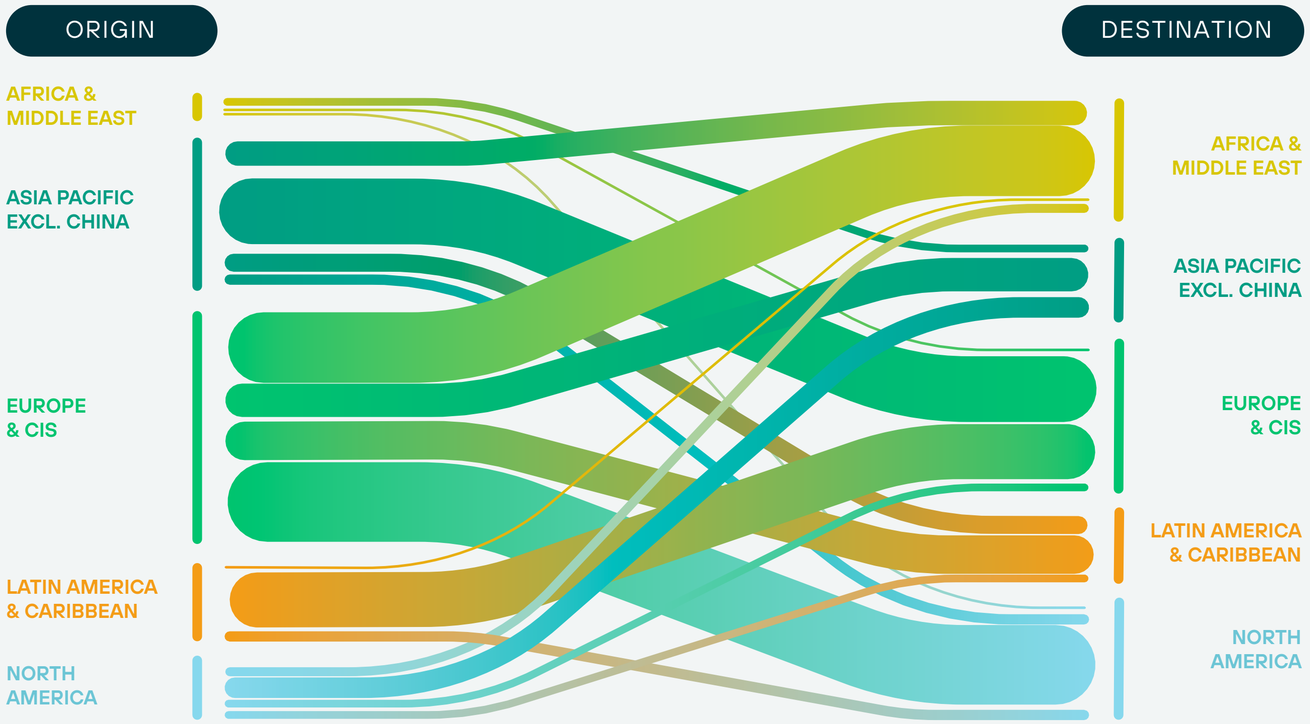
ACT AS A STRATEGIC GROWTH OPPORTUNITY

- Turboprop aircraft are a highly liquid asset that can be efficiently bought and sold on a global scale, ensuring smooth transitions across different markets.
- The highly dynamic second-hand market plays a vital role in placing new aircraft by maintaining liquidity and asset values, hence facilitating flexible fleet management.
- Pre-owned aircraft serve as a strategic tool for operators to explore and test new markets before committing to larger fleet investments.

25% of turboprops in market
changed the country of registration
in the past 5 years

Turboprop second-hand market flows

Transferred from original to current region of operation



04

Unlocking profitability in a global market

ATR FLIGHTS IN 2024

26,000

ATR busiest airport in India

CHRISTCHURCH BOGOTÁ ALGIERS **HYDERABAD – INDIA** MEMPH

Unlocking commercial advantage with Turboprops

ENABLING PROFITABLE SCALING IN THE REGIONAL AVIATION MARKET

To remain profitable in the ever-evolving aviation market, airlines must scale their operations in ways that adapt to fluctuating demand and remain profitable in changing competitive landscapes.

This is where turboprops come into their own.

Turboprops are a core asset for regional aviation operators.
They are suited for shorter regional routes where their lower operating costs enable an economically viable operation compared to larger aircraft.

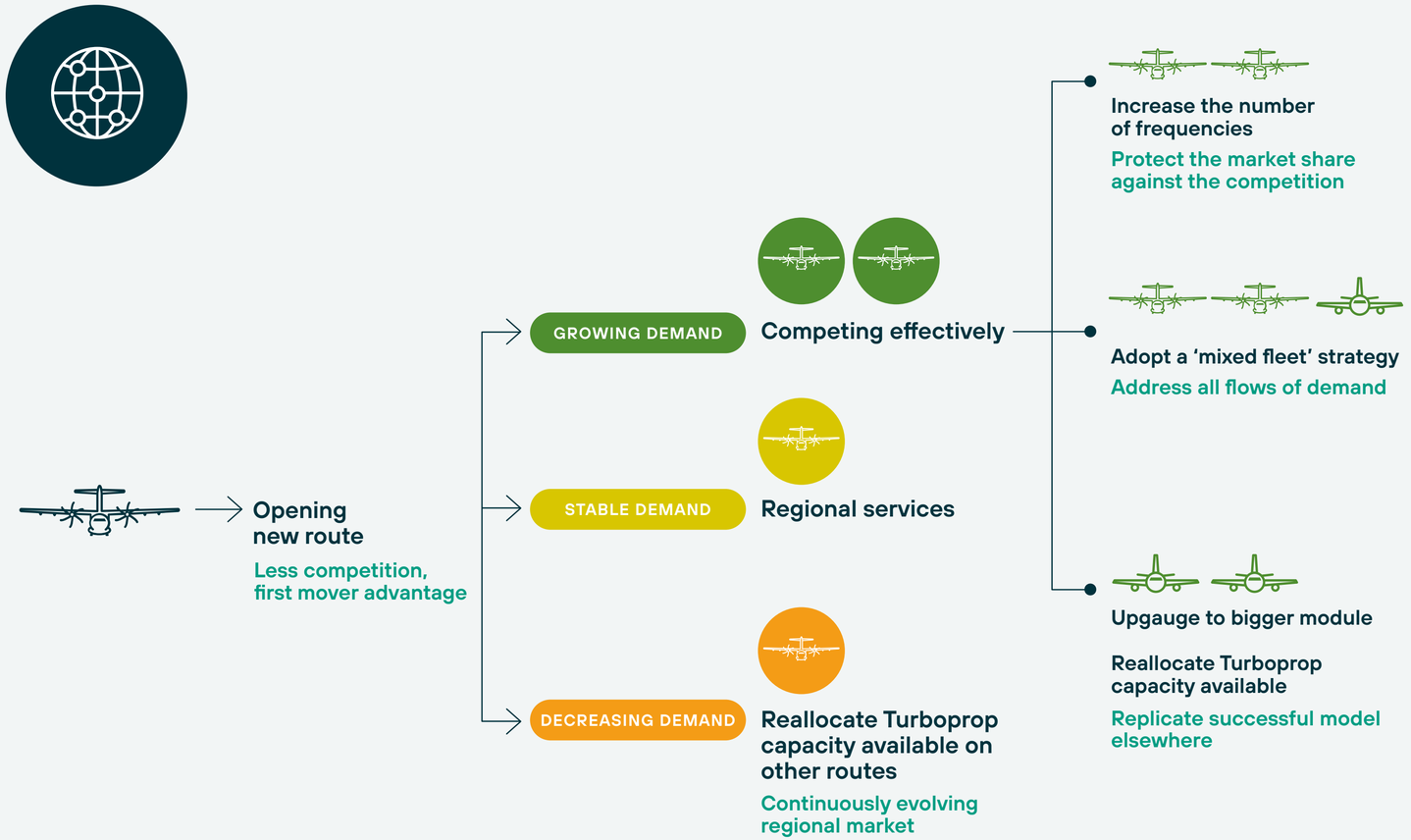
This makes them ideal for launching new routes. First mover advantage allows operators to stimulate demand and establish a strong presence before competitors enter the market.

As demand increases, competitive advantage can be sustained by providing multi-frequency services to attract high yielding passengers. The operators can also expand route capacity by adopting a mixed fleet strategy. By incorporating different aircraft sizes, such as turboprops and single aisles, airlines can better accommodate capacity to traffic demand. A mixed fleet allows airlines to adapt to the highs and lows of traffic demand depending on the time of day or day of the week. It also allows operators to maximise load factors and yields, boosting profit.

When demand continues to rise, the logical next step is to ‘up gauge’ from turboprops to bigger modules, e.g. single aisle. This offers enhanced capacity and improved efficiency for busier routes, completing a virtuous cycle of turboprop-led, profitable scaling.

The regional aviation “pathway to profitability”

HOW TURBOPROPS HELP OPERATORS SCALE STRATEGICALLY AND EFFICIENTLY



- In the ever-evolving aviation market, turboprops are catalysts of a multi-stage process that helps operators serve regional routes profitably. Throughout this process turboprops act strategically to help drive growth for operators.
- Turboprops help operators adapt to the dynamic and continuously evolving regional aviation market by maximising available capacity profitably, to stimulate demand by opening new routes.
- As route demand increases turboprops continue to drive growth through enabling mixed fleet strategies or up-gauging to bigger modules.
- This results in a turboprop-led scaling process that maximises revenue and minimises costs and risk.

Turboprops drive demand in untapped markets

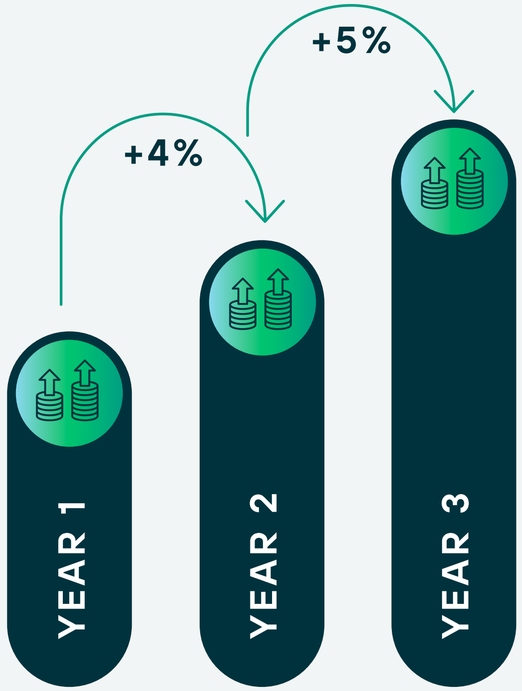
CREATING AND SUSTAINING REVENUE FOR LONGER-TERM PROFIT

- One of the biggest opportunities for operators is using turboprops to pioneer new routes.
- Being a first-mover provides a competitive advantage allowing operators to stimulate demand and establish a strong presence before others enter the market.
- Once launched, routes can reach stable demand levels. Constant passenger flows can ensure route sustainability and unlock long-term profitability.

RASK increases steadily over the years following the route launch in an uncompeted situation.

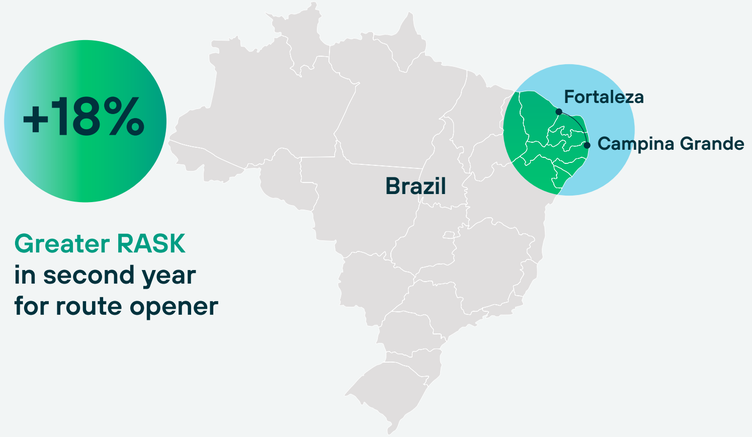
RASK increase in an uncompeted situation

Worldwide turboprop routes



Being a **first-mover** provides a competitive advantage

CASE STUDY
Campina Grande – Fortaleza



Greater RASK
in second year
for route opener

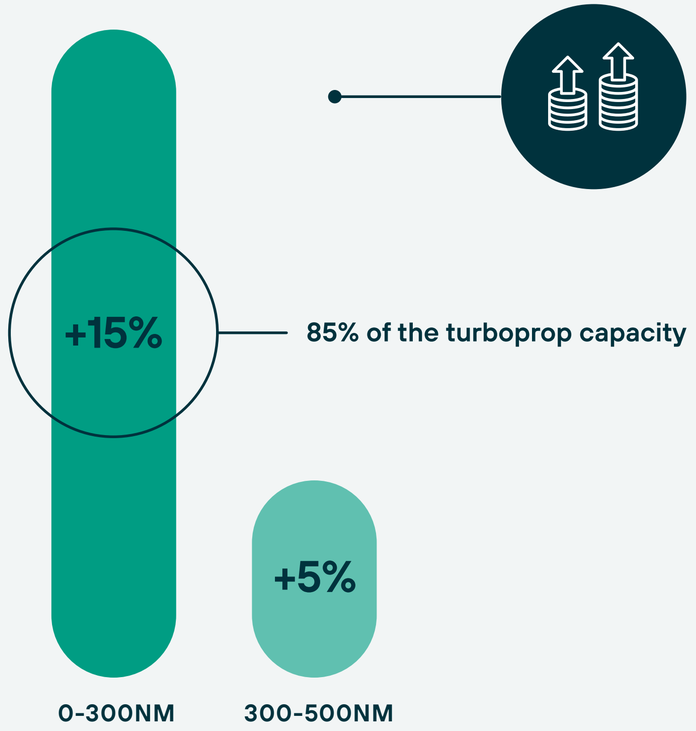
Turboprops bring direct commercial advantages

OFFERING HIGHER RASK ON REGIONAL ROUTES

- Turboprops enable profitable operations on thin routes, matching capacity with demand, which avoids yields dilution.
- Competition intensifies with distance. There is 16% more competition at 500NM compared to below 150NM. Half of the turboprop capacity operates on uncompeted routes.
- This directly benefits operators as revenue tends to be higher on routes with low competition as it allows the airlines to set their own pricing.

Competition intensifies at longer stage lengths.

Uplift in RASK on uncompeted vs competed routes (by distance)



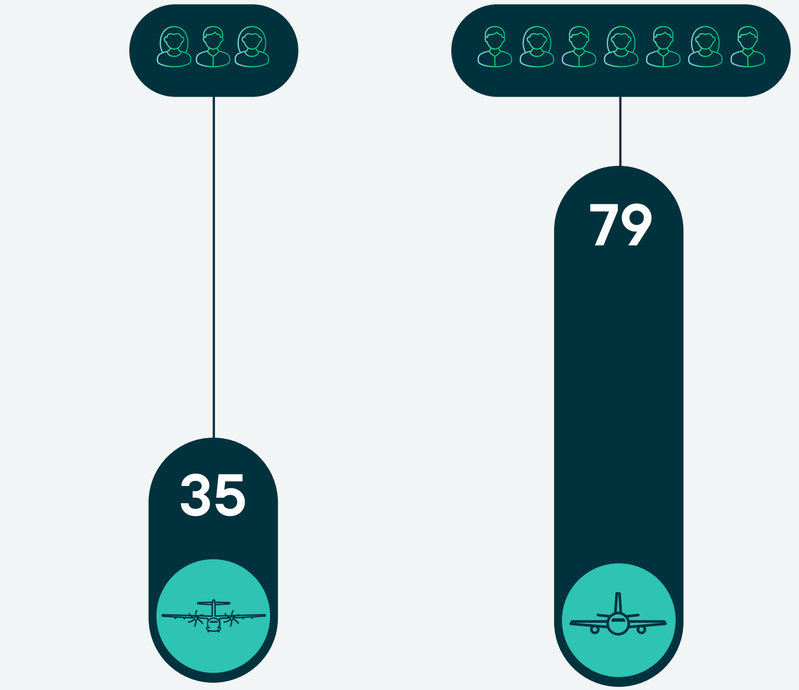
Turboprops tailored for regional sectors

SIGNIFICANT COST ADVANTAGE AND MINIMISED COMMERCIAL RISK

45% cost reduction compared to regional jet on a typical sector of 200NM.

- For shorter, low-demand routes, turboprops are the optimal choice, where they offer operators superior cost efficiencies and provide a distinct competitive edge.
- Their specialised technology and optimised design is especially tailored for short-haul operations and delivers significant cost savings over regional jets with similiar seating capacity.
- For denser routes, turboprops achieve profitability with half the number of passengers needed by a single aisle. This minimises the operator risk by lowering trip costs and commercial exposure.
- In many cases, only a 70-seat turboprop provides the right balance of capacity and cost-efficiency to sustain route viability.

Minimum number of passengers required to fly profitably



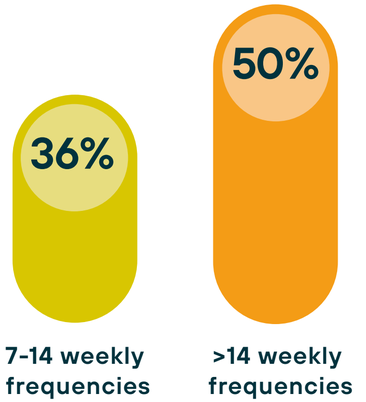
Minimum number of passengers based on the Direct Operating Cost per trip, for a sector of 250NM, analysis at constant revenue for modelling purposes.

Creating successful regional competitive strategies

- In regional aviation markets as route demand increases, so does competition. For an airline, however, continuing to operate routes with a turboprop remains a viable option.
- The ability to offer multiple-frequency routes strengthens and protects operators' market presence and provides a more convenient schedule. This increases travellers choice and satisfaction, as well as attracting high-value passengers.

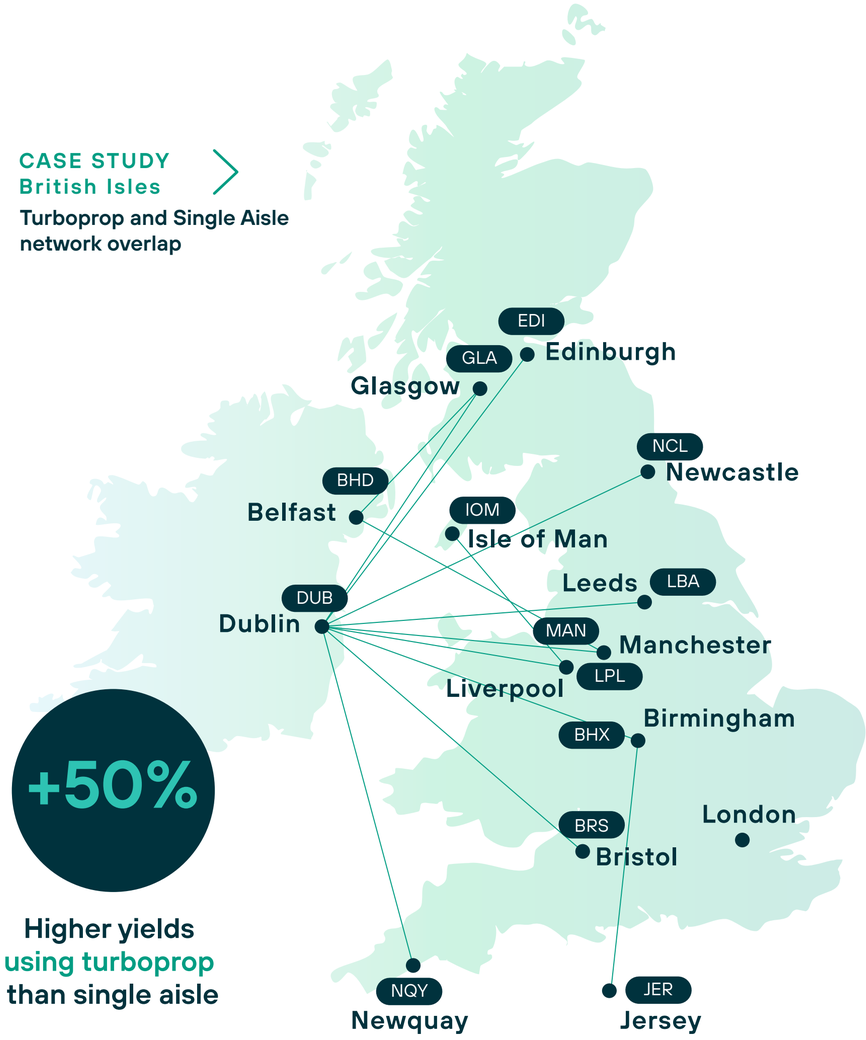
Uplift in RASK by frequency

(compared to less than 7 weekly frequencies)



CASE STUDY
British Isles

Turboprop and Single Aisle network overlap



Higher yields using turboprop than single aisle

Mixed fleet or upgauge strategies provide a competitive advantage

MAXIMISE PROFITABILITY BY ACCESSING HIGH PASSENGER FLOWS AND HIGHER YIELDS

- As aviation routes mature over time, demand can increase due to price stimulation by operators.
- In this context, operators have different options to maximise profitability: keep both turboprops and single aisle on the route or upgauge to larger modules.
- The mixed fleet approach helps capture both large flows and high-yield passengers, giving operators the competitive advantage of serving a broader range of market needs.

Turboprop operators also have single aisle in their fleet. **25%**

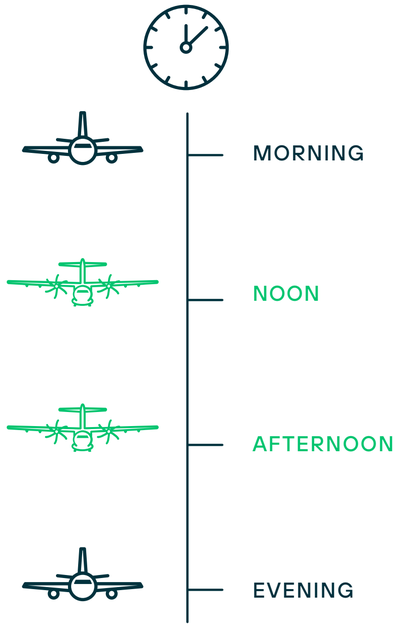
Growth profile of turboprop routes (2015 - 2024)

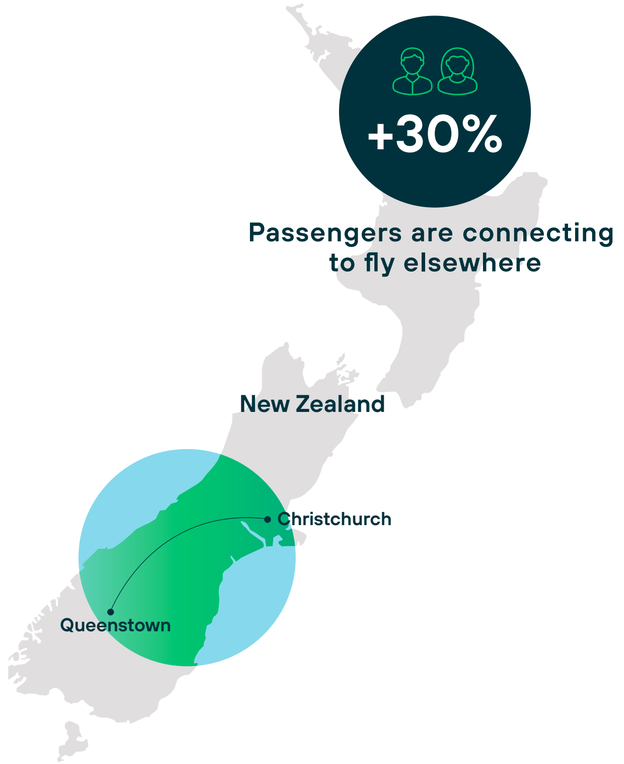
Generating growth with fleet complementarity

CASE STUDY: AIR NEW ZEALAND

- Air New Zealand is a perfect example of fleet complementarity.
- On some domestic routes such as Queenstown to Christchurch (188NM), they operate both ATR 72-600 and A320.
- With the single aisle, Air New Zealand captures part of the long-haul market, morning and evening, from Auckland.
- With the turboprop, the airline provides additional schedule choice through the middle of the day, when demand is lower and passengers are mostly flying point to point.

Christchurch — Queenstown
Typical day of operation





For Air New Zealand this route is proven to be valuable.
The RASK has grown constantly over the years.

05

Regional forecast

ATR FLIGHTS IN 2024

20,000

ATR busiest airport in Latin America & Caribbean

ALGIERS FORT LAUDERDALE **BOGOTÁ** – COLOMBIA TOUL

Focus on Africa & Middle East

DELIVERIES

TP70

195

TP50

45

240
Total deliveries

2.6%
GDP Growth

4.2%
Traffic Growth

- As population and wealth expand in the region and regulatory barriers are reduced with the implementation of SAATM, Africa and the Middle East are expected to experience a high air traffic growth rate.
- Turboprops will play a fundamental role in enabling convenient connections that link secondary to secondary gateways across the continent.

Focus on Asia Pacific, excl. India

DELIVERIES

TP70

630

TP50

205

835
Total deliveries

2.7%
GDP Growth

7.0%
Traffic Growth

- Asia Pacific (excluding India) will be the region where the highest turboprop demand is expected in the coming 20 years.
- In mature economies, such as Japan, Australia and New Zealand, with an extensive regional network turboprops provide convenient links to remote communities. They also offer schedule convenience to domestic travellers flying to popular gateways.
- In South-East Asia, modal shifts from boat and road to air, fuels new route creation. Turboprops are frequently used as route openers due to their low seat count and favourable economics.

Focus on Europe & CIS

DELIVERIES

TP70

275

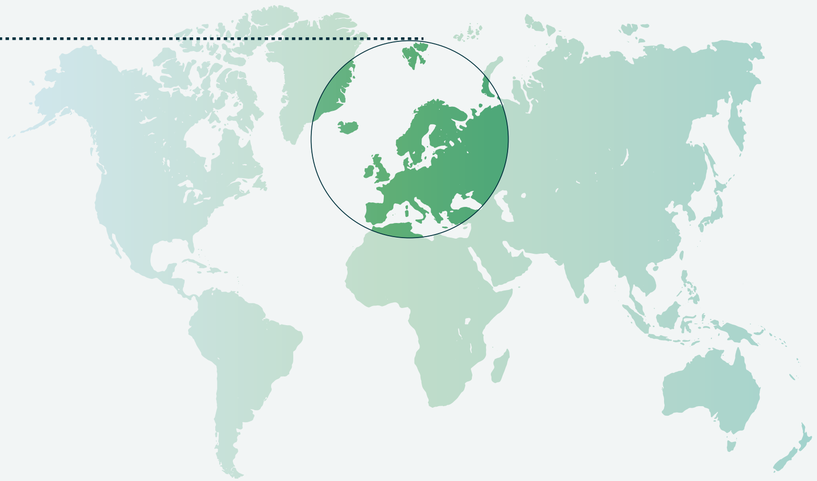
TP50

85

360
Total deliveries

1.3%
GDP Growth

4.2%
Traffic Growth



- Turboprops in Europe play an important role providing essential connectivity across the continent and its outer-most regions.
- Fleet replacement of ageing turboprops and regional jets will be the main trend underpinning regional aviation developments in Western Europe. While in Eastern Europe and Central Asia, transversal connectivity will provide further opportunities for growth.

Focus on India

DELIVERIES

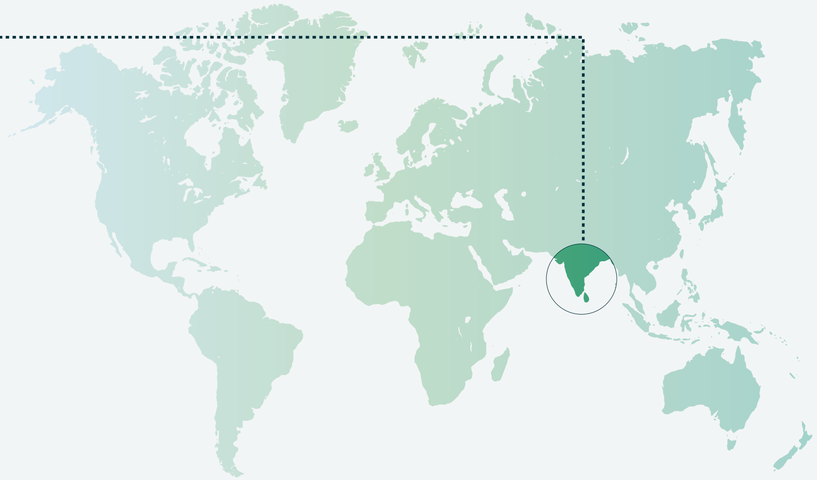
TP70

210

TP50

0

210
Total deliveries



5.3%
GDP Growth

9.2%
Traffic Growth

- India's domestic market has been one of the fastest growing in recent years.
- Rapid expansion of the middle-class has given increased access to air travel from current airports while boosting the necessary construction of new airports to cater for increased air traffic demand.

Focus on Latin America & Caribbean

DELIVERIES

TP70

150

TP50

50

200
Total deliveries

1.9%
GDP Growth

3.9%
Traffic Growth

- Latin American geography comprises high mountains, sparsely populated areas and a plethora of Caribbean islands.
- Turboprops fly to secondary destinations and operate inter-island, providing fast and convenient links that substitute long journeys by bus or boat.
- In several Central and South America countries turboprops are the backbone of the domestic air network.

Focus on North America

DELIVERIES

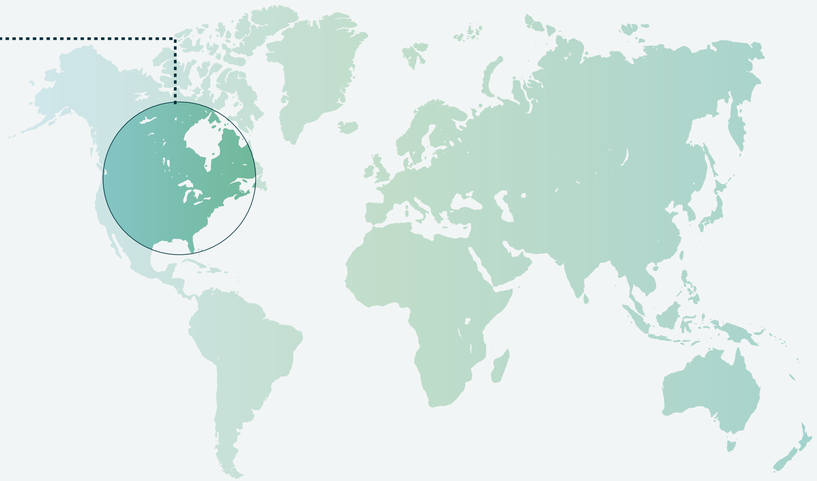
TP70

230

TP50

25

255
Total deliveries



1.9%
GDP Growth

4.4%
Traffic Growth

- The US in the largest regional aviation market worldwide, although it is experiencing a decline in connectivity.
- Turboprops are the only readily available solution to replace ageing small regional jets that fly thin routes to secondary destinations profitably. They also reduce the environmental impact of regional aviation.
- In Canada, turboprops play a vital social role keeping many of the remote communities in the North connected. They also provide convenient domestic connections between primary and secondary gateways.

06

Freighters:
serving local communities

Fedex HQ

HYDERABAD BOGOTÁ ALGIERS **MEMPHIS** – USA TOULOUSE

Regional freighters key for essential connectivity

TURBOPROPS PLAY VITAL SOCIAL ROLE FOR COMMUNITIES

Regional freighters play a crucial role in keeping communities connected and strengthening supply chains around the world.

Turboprop freighters enhance the quality of life for remote communities, being able to deliver essential goods and services quickly and seamlessly.

Importantly, regional freighters facilitate access to services and amenities in locations that are otherwise difficult to reach when other transport routes are impeded.

For example, in Northern Canada and Scottish Islands turboprops ensure essential connectivity when roads are closed by heavy snowfalls during winter, or when storms force cancellation of sailings.

As a consequence, businesses and communities can access the same level of services and lifestyles regardless of where they are across a country.

Turboprops also enable vital resilience to international supply-chains. They ensure connectivity to parts of the world where operators must fly over perilous zones. In Africa, for instance, turboprop freighters transport time-sensitive goods where road travel is deemed unsafe.

Regional freighters are also key contributors to humanitarian aid missions, for example the UN Food Program.

Strong turboprop freighter growth expected in next 20 years

OPTIMAL SOLUTION TO TRANSPORT PAYLOADS BELOW 9TN

92% of the current regional **freighter fleet is turboprop.**

Turboprop freighter growth by model

Baseline
2025

TP 70	TP 50	TP 30
147	83	130

Forecast
2044

TP 70	TP 50	TP 30
485	15	0

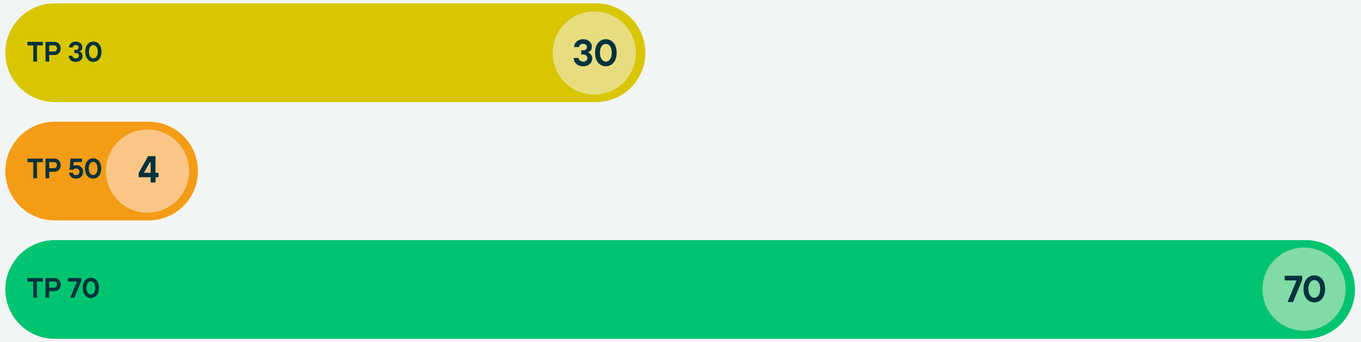
500 turboprop freighter in the next 20 years

Large turboprops are the sweet-spot for regional freighters

LACK OF CONVERSION FEEDSTOCK RENDERS THEM MORE ATTRACTIVE

- Large turboprops are the category of choice for freighter operations due to their optimum combination of operating economics and capacity.
- For example, 67% of turboprop freighters joining fleets since 2020 were in the 70-seater turboprop segment.
- Going forward, this trend towards larger turboprop modules will intensify due to the current lack of feedstock in the 30 and 50-seater turboprop segment.
- Turboprop freighters also have a low fuel burn and low noise footprint, further reducing operator exposure to noise regulations and additional costs.

Total number of turboprop freighter entries into the market
(conversions and new aircraft; 2020–2024)



Total fuel burn to usable volume ratio (kg:m³)
(on routes up to 200NM)

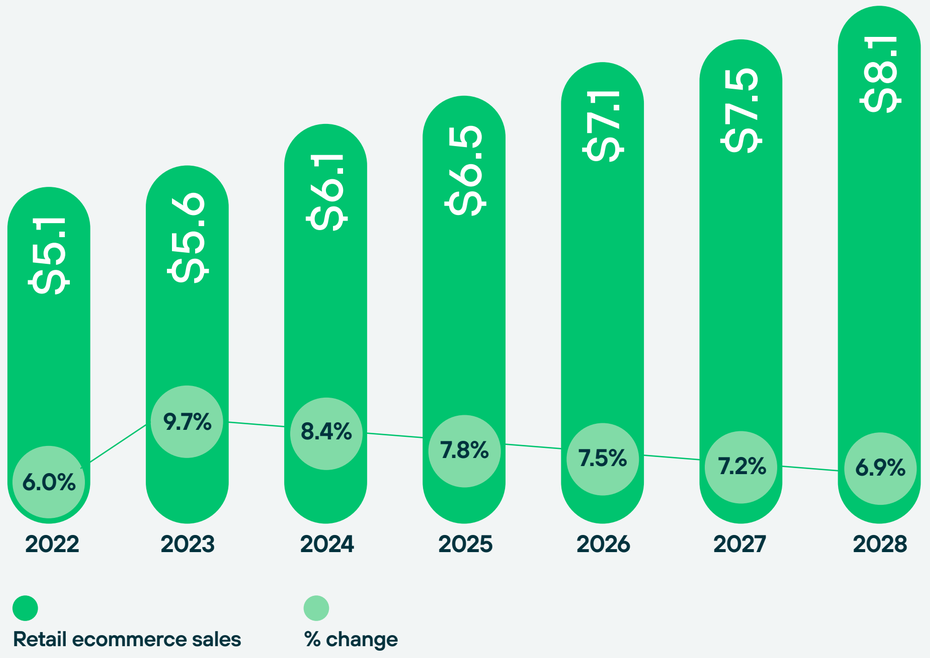
E-commerce increases demand of turboprop freighters

BUILDING SUPPLY-CHAIN RESILIENCE ACROSS MARKETS

- The past five years have seen a steady increase in the turboprop freighter fleet, primarily driven by growth in Europe, the USA and Canada.
- At the same time, many ageing aircraft have been replaced by new freighter turboprop conversions or factory-built freighter turboprops.
- A majority of the turboprop freighter fleet serves the Express market segment. Many shipments carried by turboprop freighters are made up by the e-commerce sector whose rapid adoption in mature economies has driven fleet growth over the past decade.
- Other turboprop freighters connect 'Just in Time' production lines across continents, providing a valuable transport alternative to build supply chain resilience.

Retail Ecommerce Sales Worldwide 2022–2028

trillions, % change



≈66%

Turboprop freighter fleet dedicated to the Express market segment

x2.7

E-commerce GMV[10] growth in South-East Asia (2024 vs 2030)

[10]e-Conomy SEA, 2024

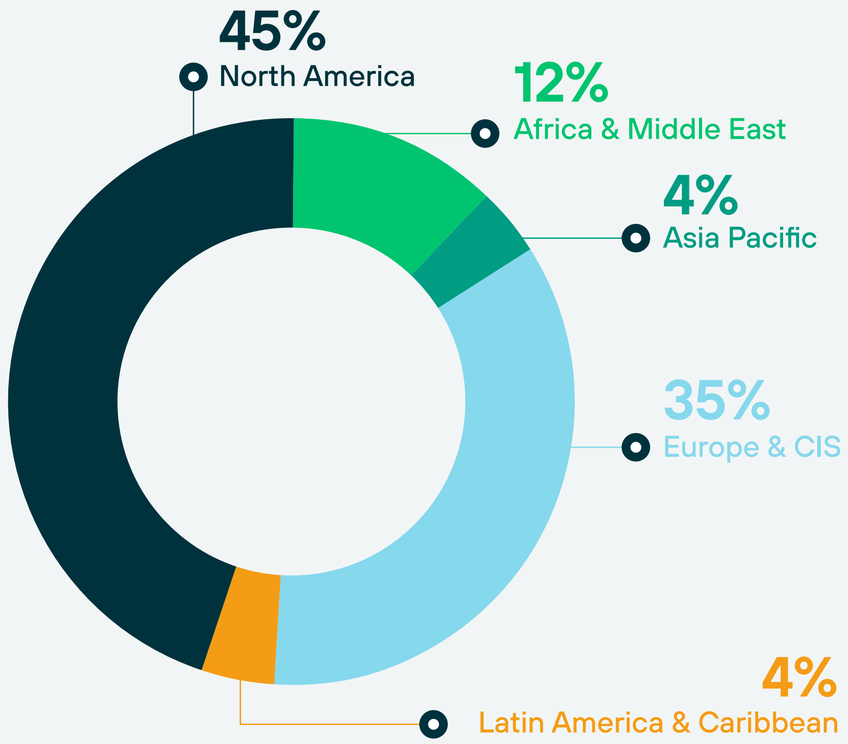
Source: Emarketer Forecast, July 2024.

Turboprop freighters operating successfully in mature economies

SIGNIFICANT GROWTH OPPORTUNITY IN EMERGING ECONOMIES

- The majority of the world's turboprop freighters are operating in mature economies with well-established carriers.
- However, the highest global growth regions are found in India, South-East Asia and Latin America where markets are experiencing increased demand for air cargo due to high e-commerce growth rates.
- As consumer demand increases beyond the primary gateways in these fast-growing markets, turboprop freighters can act as a vital contributor providing rapid deliveries across often complex geographies.

Turboprop freighter fleet distribution by region



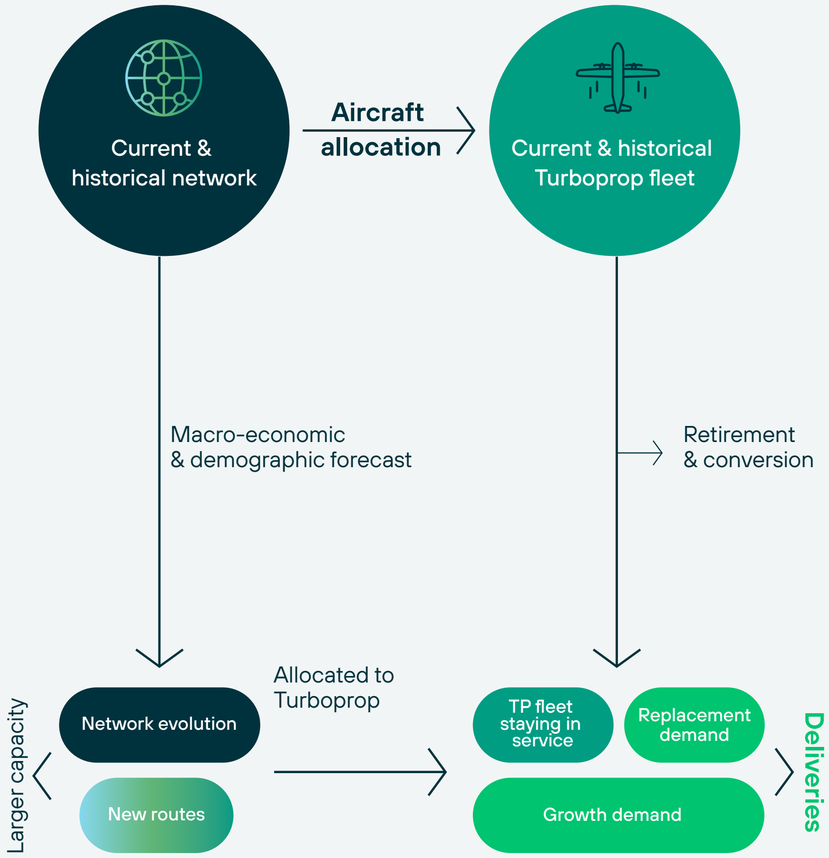
07

Methodology

ATR FAL

ALGIERS FORT LAUDERDALE TOULOUSE – FRANCE CHRIS

Methodology and Assumptions



THE FOLLOWING ASSUMPTIONS AND DEFINITIONS APPLY UNLESS OTHERWISE STATED

- Turboprop in-service fleets are considered in the range of 30-80 seats in standard configuration including storage.
- Regional Market definition: scheduled passenger traffic considering
  - Distance between 5 and 900 NM (Nautical Miles)
    Minimum of 50 SPWEW (Seats Per Week Each Way)
  - For the routes between 5 and 150 nautical miles
    Maximum of 750 SPDEW_PC (Seats Per Day Each Way Per Carrier)
  - For the routes between 150 and 250 nautical miles
    Maximum of 450 SPDEW_PC (Seats Per Day Each Way Per Carrier)
  - For the routes between 250 and 900 nautical miles
    Maximum of 300 SPDEW_PC (Seats Per Day Each Way Per Carrier)
- Traffic allocation to all types of existing 30+ seats aircraft categories, jet and turboprop technologies.
- Deliveries include aircraft currently in-production and launched programs.
- Major changes to the regional aviation ecosystem were not factored in. They include, but are not limited to: fuel and emissions prices, disruptive technologies, regulatory frameworks, passenger dynamics.
- TP Production levels in the next decade are limited by supply chain constraints and expected evolution.
- The Forecast assumes a constant competitive advantage across aviation market segments

Abbreviations

- ASK: available seat kilometer – seats multiplied by distance
- CO_{2eq}: CO_2 equivalent considering Global Warming Potential over 100 years
- GDP: nominal Gross Domestic Product considered in this document at constant prices and exchange rates
- HST: High Speed Train
- O&D: Origin and Destination
- RASK: revenue per ASK
- Yield: revenue per Revenue Passenger Kilometer (RPK)

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Safe harbour statement

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- → Customer, supplier and subcontractor performance or contract negotiations, including financing issues.
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- → Significant collective bargaining, labour disputes.
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