Clúster
Bioturbosina

IPICYT

FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

Esfuerzos de aerolíneas internacionales para implementar combustibles alternativos de aviación.

Robert BOYD
Gerente de Medio Ambiente
Combustibles Alternativos de Aviación
IATA

Clúster
Bioturbosina

IPICYT

FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

International Airline Efforts to Implement Sustainable Aviation Fuel

Speaker: Robert Boyd - IATA

Date: 4 September 2018

Overview:

- Aviation today – Global and Mexico
- Industry momentum / industry need
  - The short, medium and long term, direction
- Sustainable Aviation Fuel (SAF)
  - Facts and airline examples
- Policy
  - Importance
  - Momentum
  - Opportunities

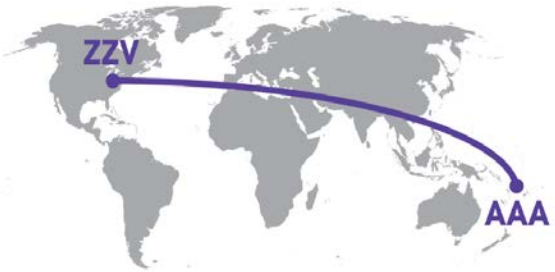
What are the motives for any change to business as usual?

Clúster Bioturbosina

Aviation today

CONNECTING THE WORLD

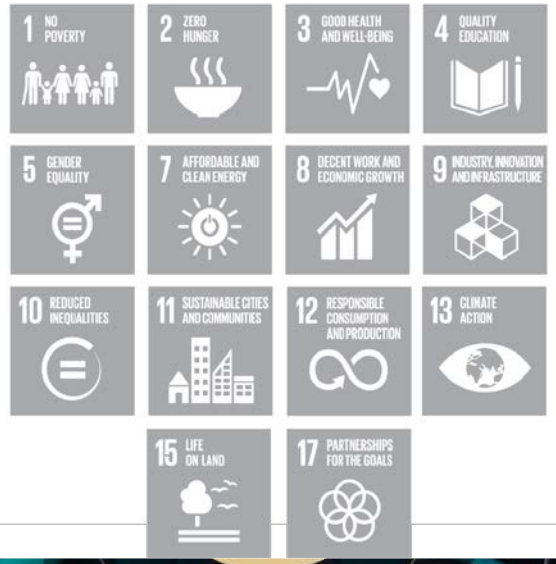
4 BILLION PASSENGERS
51,000 ROUTES



35% OF WORLD TRADE
54% OF GLOBAL TOURISTS

SUPPORTING GROWTH

62.7 MILLION JOBS
$2.7 TRILLION IN GDP
14 SDGS SUPPORTED



EFFICIENCY GAINED

FUEL EFFICIENCY ↑ 2x
SINCE 1990

80% REDUCTION IN CO_2

100+ AIRPORTS WITH SOLAR

56m TONNES CO_2 SAVED
THROUGH WINGLETS SINCE
2000

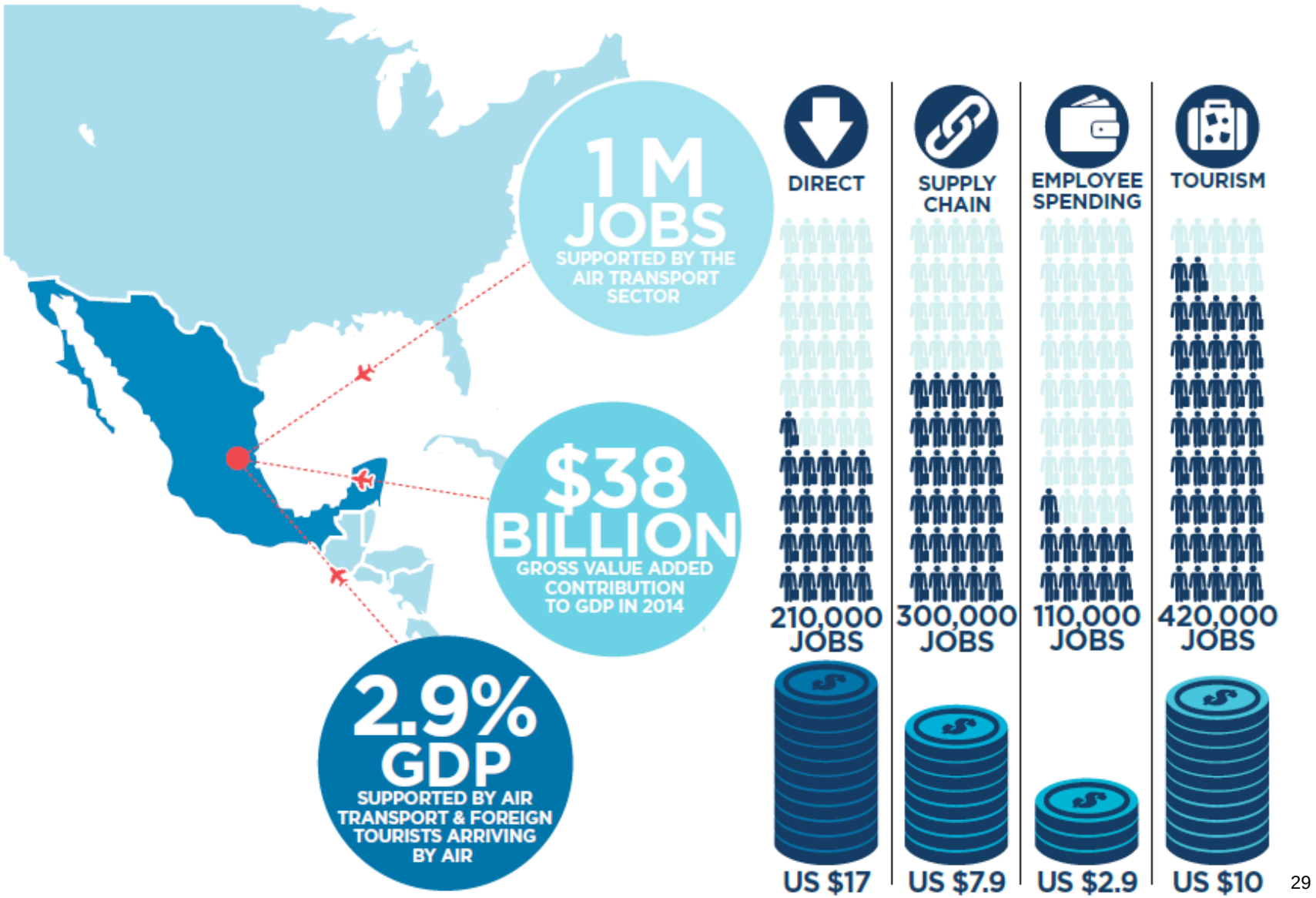
www.enviro.aero/climatesolutions

Domestic and International PAX in Mexico are expected to double over the next 20 years

Clúster Bioturbosina

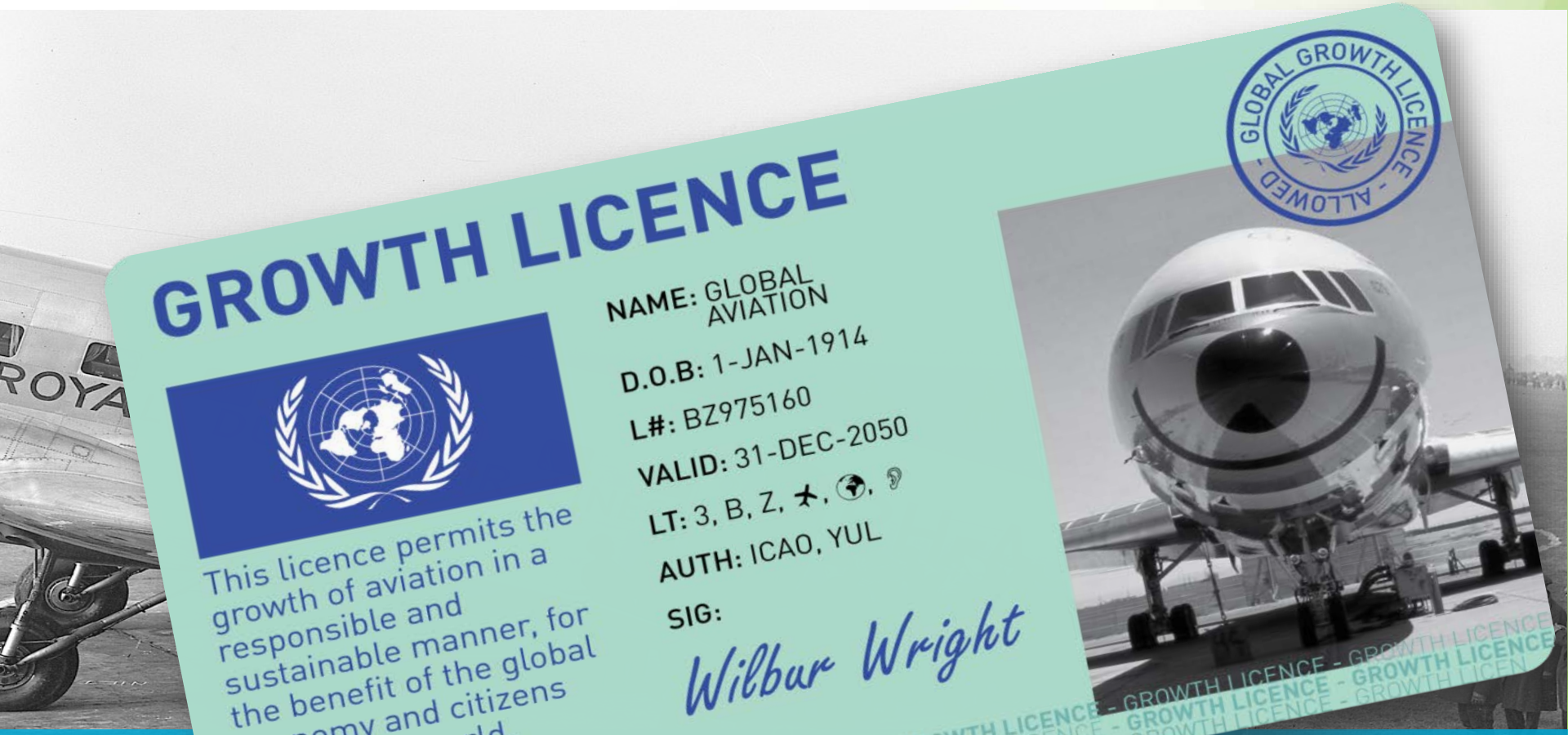
Source: IATA forecasts

The air transport sector makes a major contribution to the Mexican economy



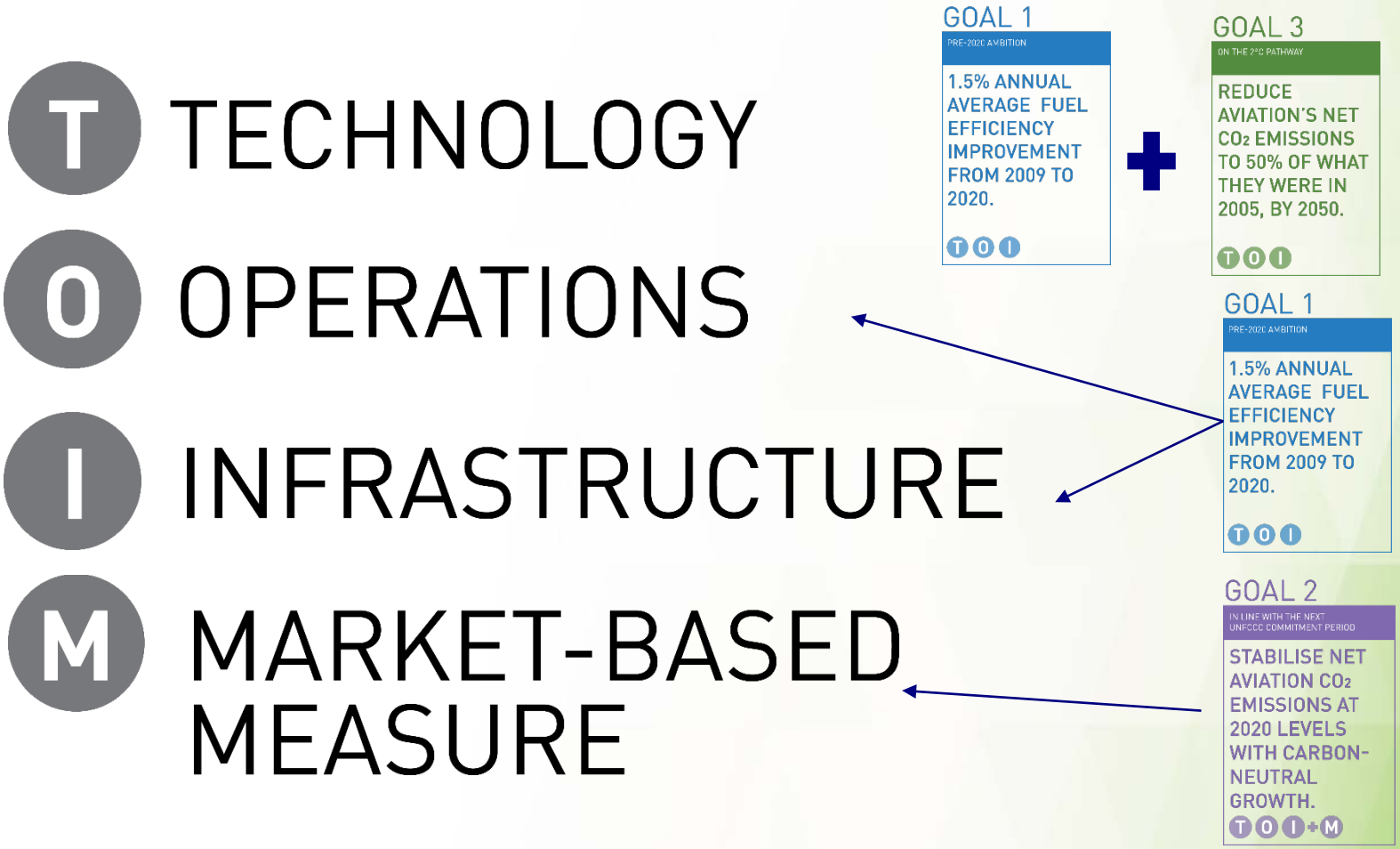
Source: IATA Economics

The growth conundrum…



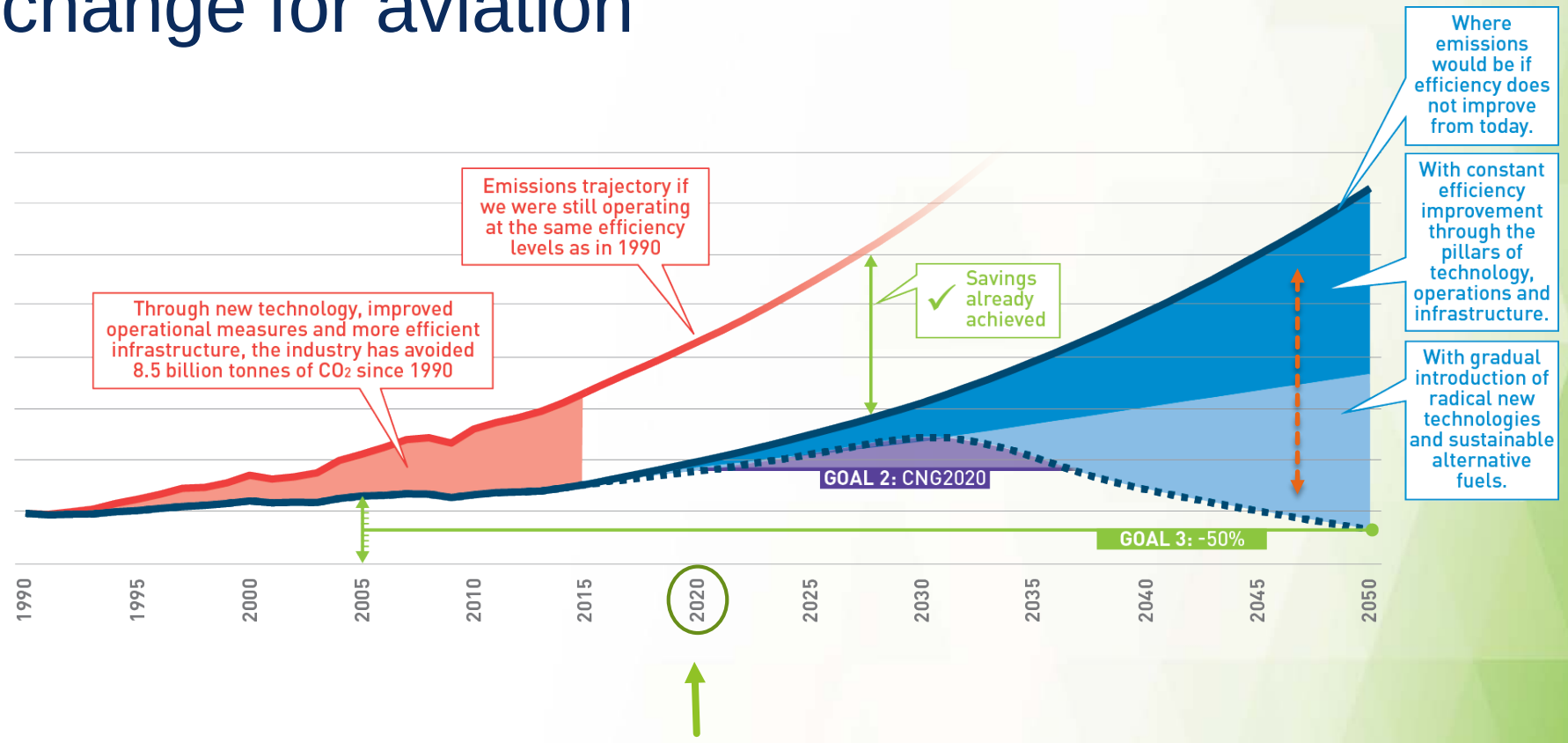
Mor passengers have taken a flight in the first 104 years!

A four pillar theme of continuous improvement



Clúster Bioturbosina

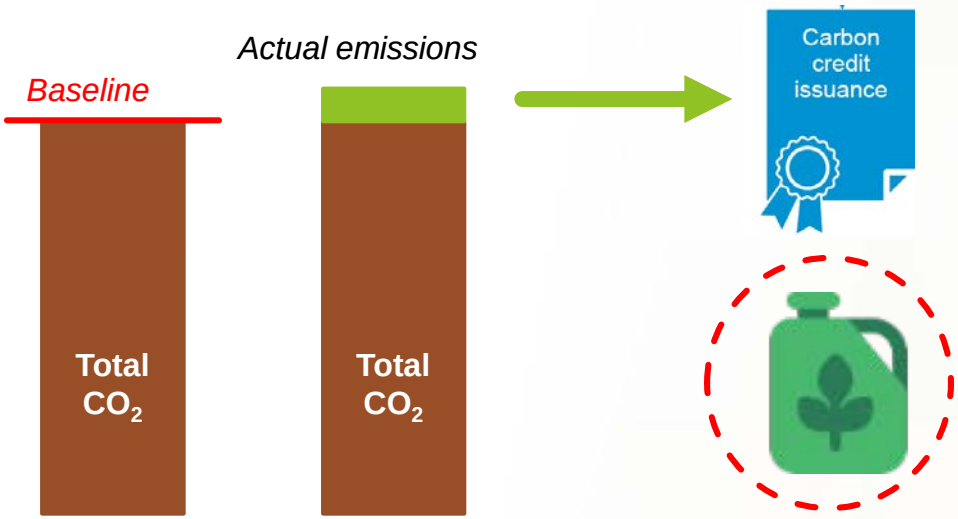
CORSIA represents a significant policy change for aviation



Clúster Bioturbosina

Source: ATAG

Offsetting



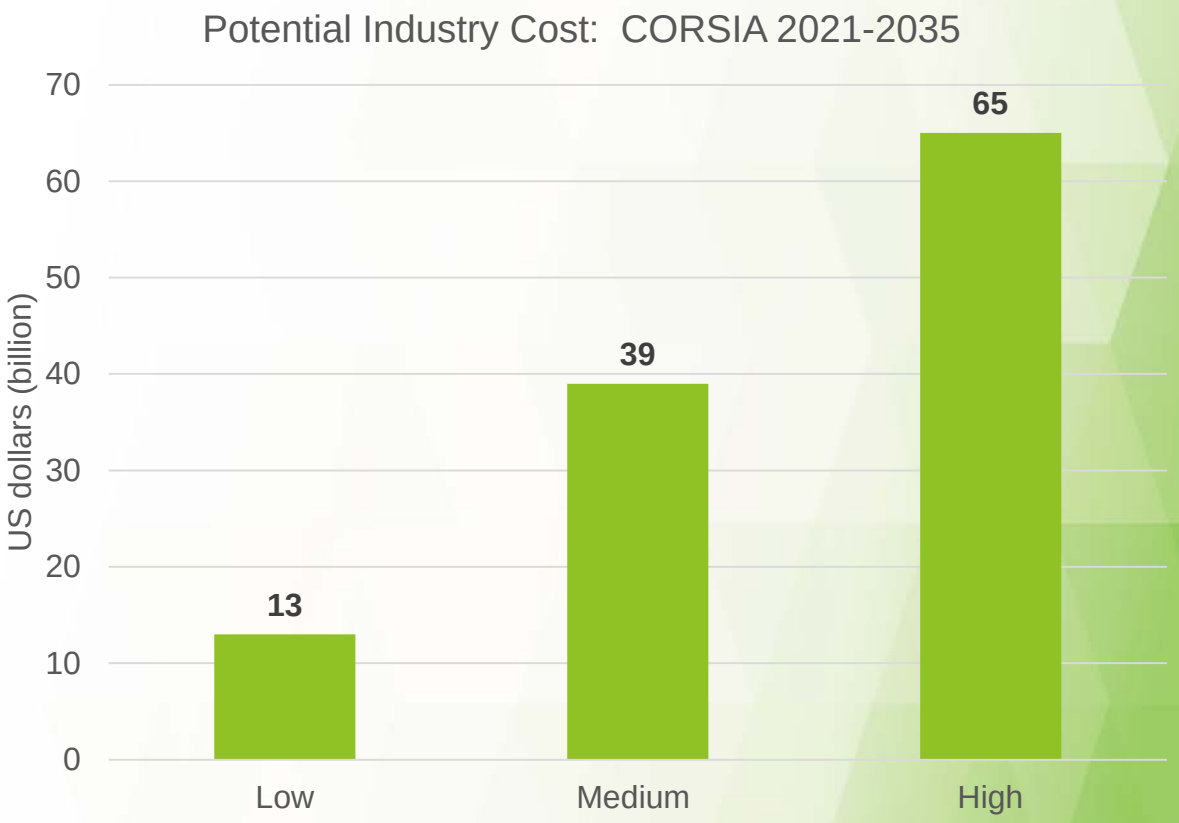
Each company must compensate for emissions above its baseline with emission reductions achieved elsewhere or CORSIA eligible fuel which includes **sustainable aviation fuel**

Clúster Bioturbosina

Cost could be between $13 billion and $65 billion USD

- The potential carbon offsetting purchases needed under CORSIA is estimated by ICAO to be 2.6 billion tonnes from 2021-2035

- Low = $5 USD/tonne CO2
- Medium = $15 USD/tonne CO2
- High = $25 USD/tonne CO2



Clúster Bioturbosina

Source: IATA Environment estimate for illustrative purposes

Sustainable Aviation Fuel (SAF) – the facts

- First experimental biofuel flight: February 2008
- Massive testing and certification program (through ASTM)
- Now have 5 ‘technical pathways’ certified for use…and 15+ in the pipeline
- Drop-in specification vital
- Daily flights from 2016
- Industry views on sustainability are aligning
- Some airlines are making financial commitments in SAF production
- Significant growth in innovative deployment solutions from governments to the private sector

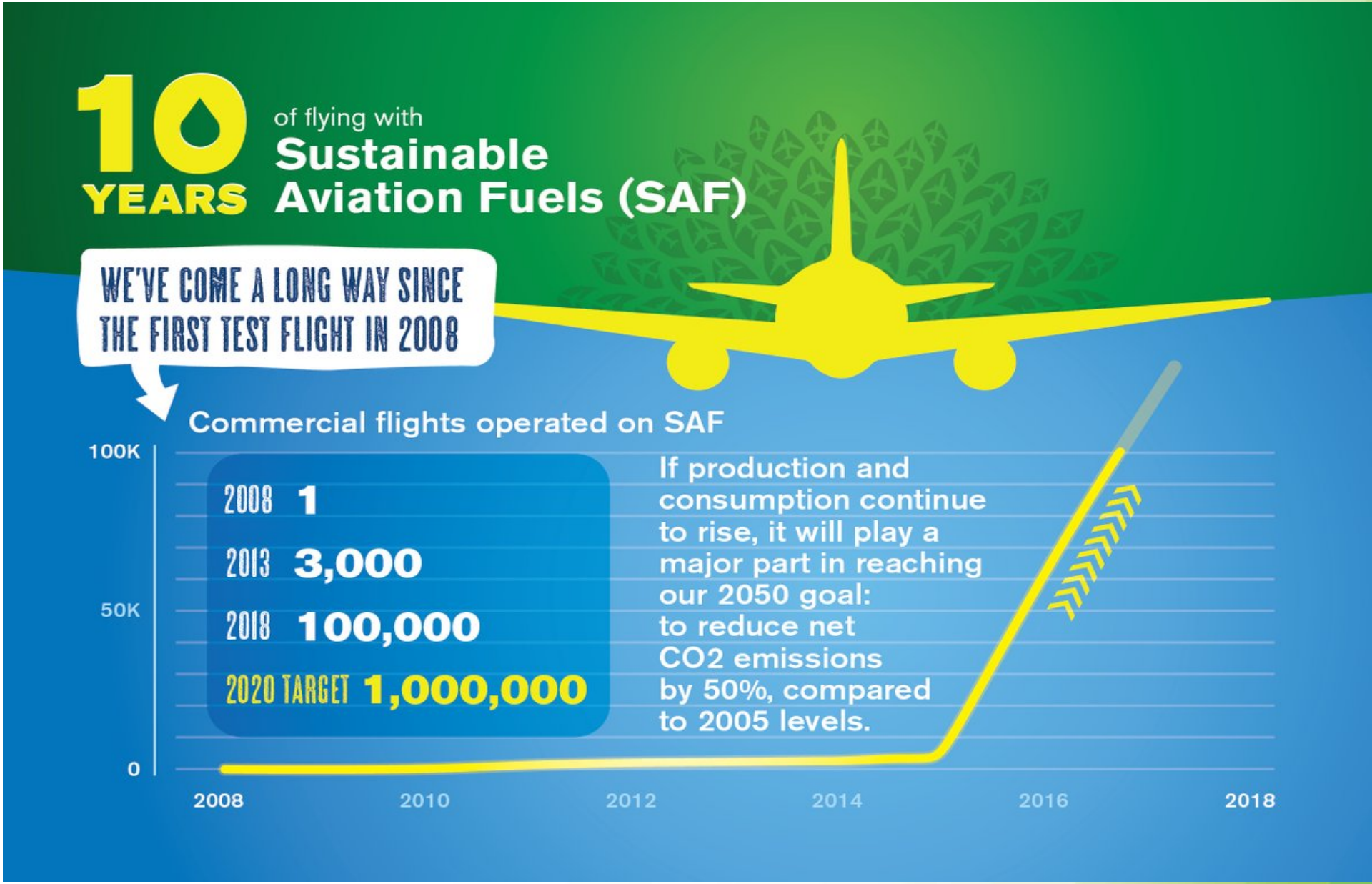
SAF Facts: Testing and commercial history

- Must be technically certified as fit-for-purpose, just like regular Jet fuel
  - (ASTM d1655 / d7566).
- Meets the same technical specifications as conventional jet fuel, in particular resistance to cold and high energy content
- Sustainability criteria is important: IATA AGM Resolution / SAFUG / EU ETS / CORSIA and other
- All current certifications require some blending with fossil kerosene
- Over 5 billion liters in SAF off-take agreements

We only see the tip of the SAF iceberg

- Only a small number of airline efforts are in the form of publicly announced offtake agreements
- There is a huge amount of effort taking place out of the public eye, including commercial discussions
- Over the next few years we will see a number of additional SAF agreements by airlines

Clúster Bioturbosina


10 YEARS
of flying with
Sustainable Aviation Fuels (SAF)
WE'VE COME A LONG WAY SINCE THE FIRST TEST FLIGHT IN 2008
Commercial flights operated on SAF
100K
50K
0
2008 1
2013 3,000
2018 100,000
2020 TARGET 1,000,000
If production and consumption continue to rise, it will play a major part in reaching our 2050 goal: to reduce net CO2 emissions by 50%, compared to 2005 levels.
2008
2010
2012
2014
2016
2018

Is sustainability important?

June 2017, Cancun *- The International Air Transport Association (IATA) 73rd Annual General Meeting (AGM) approved a resolution calling for governments to implement policies to accelerate the deployment of sustainable aviation fuels (SAF).*

5. *Endorses the continuing efforts of its member airlines and other industry stakeholders to develop, test and deploy into commercial operations cost competitive SAF which* ***conserve an ecological balance by avoiding the depletion of natural resources****, as an important element of the industry's overall approach to address CO2 emissions from aviation;*

Clúster Bioturbosina

Sustainable Aviation Fuel Users Group

2018 estimated aviation spend on liquid fuel

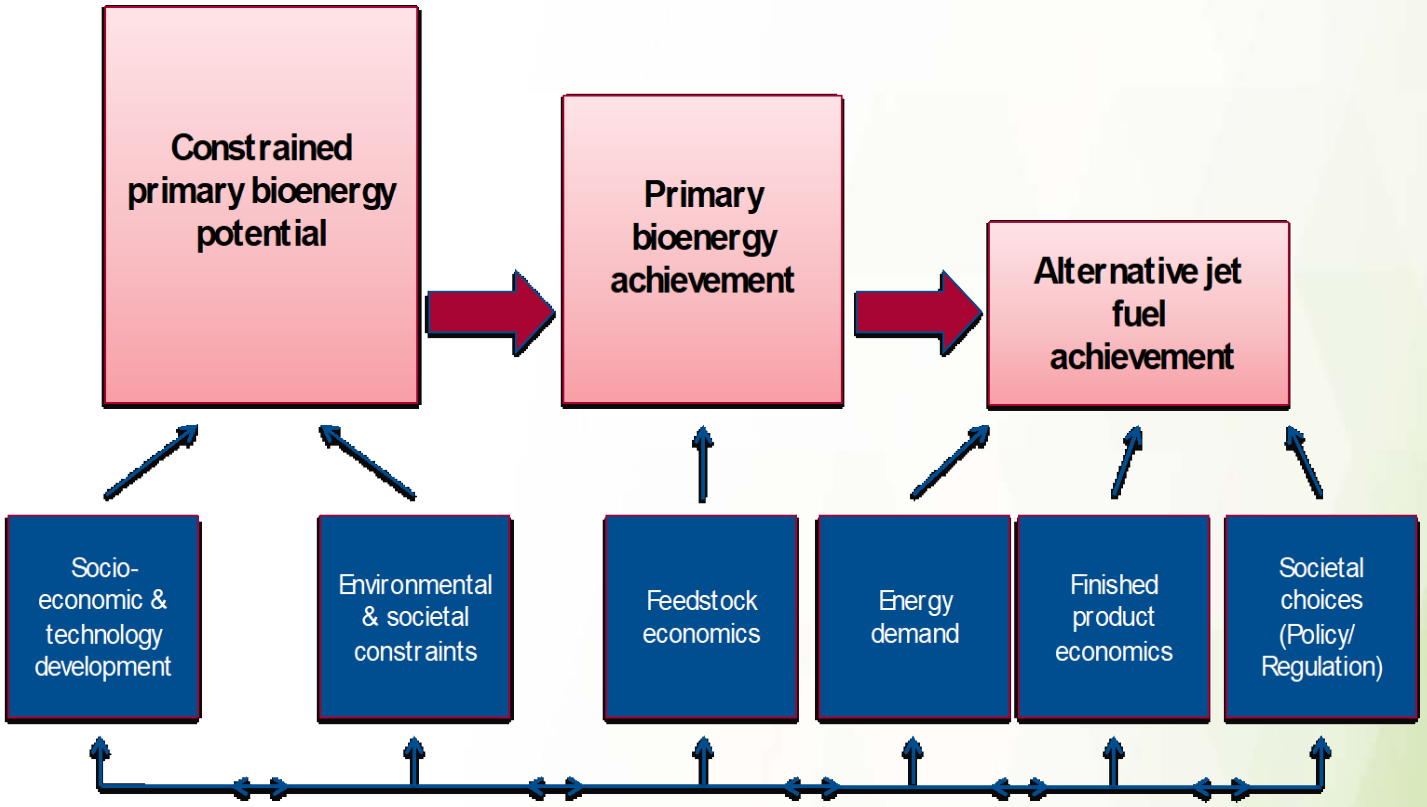
$140 billion (99.96%)

$0.05 billion (0.036%)

Clúster Bioturbosina

But what could the potential technically be?

2050 Fuel Production Assessment (ICAO-AFTF)



Clúster Bioturbosina

Source: ICAO / MIT / IATA

Policy and challenges

What are some of the major barriers to increased deployment?

- Most policies favour the ground transport sector, especially ethanol and renewable diesel
  - Hence – more economic to produce for ground transport
- Higher production cost of HEFA SAF relative to Renewable Diesel
- Relatively low conventional fuel prices
- Limited experience for equity investors and debt providers to understand business case risk
- Significant multi-stakeholder education required
- The Traditional energy sector continue to receive substantial subsidies from governments and development banks

Clúster
Bioturbosina

Biofuel Mandates in Place in over 60 countries

Clúster
Bioturbosina

ICAO (AFTF) policy guidance task group

Net Present Value - the value of all future cash flows, discounted to nominal dollars in the base year. In general, a project NPV greater than zero indicates a financially viable project, and a NPV below zero indicates a project that is not financially viable.

Minimum Selling Price - the lowest price at which the fuel product must be sold in order to have a project Net Present Value of zero at the stipulated rate of return.

Policy guidance report and results due in 2019

Policy	Model Implementation
Input subsidy	Reduce feedstock costs
Capital grant	Reduce initial capital cost
GHG emission reduction-defined incentive	Give a monetary credit based on GHG reduced*

Clúster Bioturbosina

Source: ICAO / IATA – illustrative example

The speed of change will be a function of….

- ✓ **Research**: continue to develop new sustainable feedstocks and optimise production processes = lower costs
- ✓ **Infrastructure**: rapid construction (or refurbishment) of production facilities
  - ✓ Estimated there will be a need for investment of around $100bn a year globally on infrastructure to meet 2050 volumes
- ✓ **Policy**: incentives for offtake (or de-risking infrastructure) and (at minimum) a level playing field
  - ✓ Aviation is not yet seen as a potential market everywhere
  - ✓ Cost of CO_2 offset vs. abatement

Clúster
Bioturbosina

IPICYT

FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

Questions