



Flyvning og klimaet



Jeppe Juul

Vækst i udledningen



2% global CO₂



5% global warming



+8% EU emissions in 2016



**+90% emissions
since 1990**

AVIATION > 5.5%

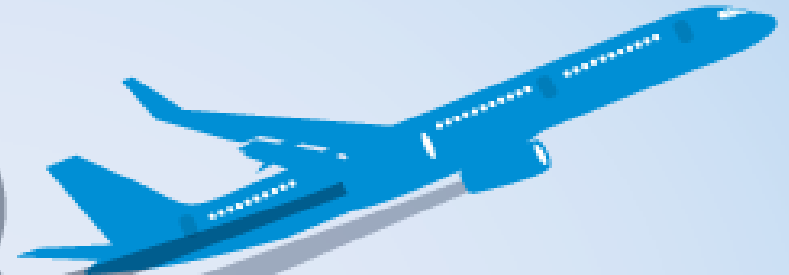
Contrails

2.8%

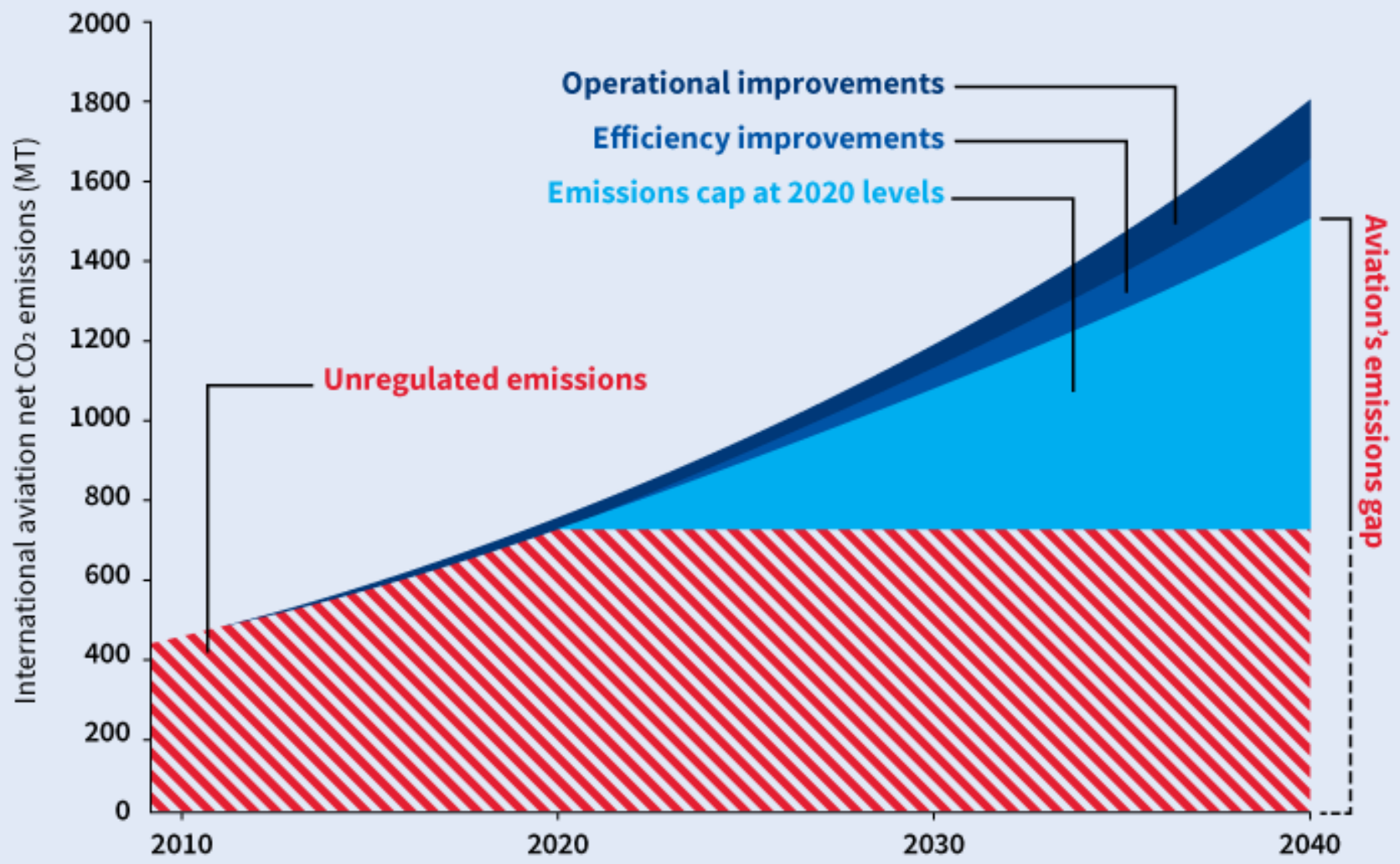
CO₂
1.75%

NO_x + Others

.95%



How big is aviation's emission gap?



ICAO's weak plan to reduce global emissions



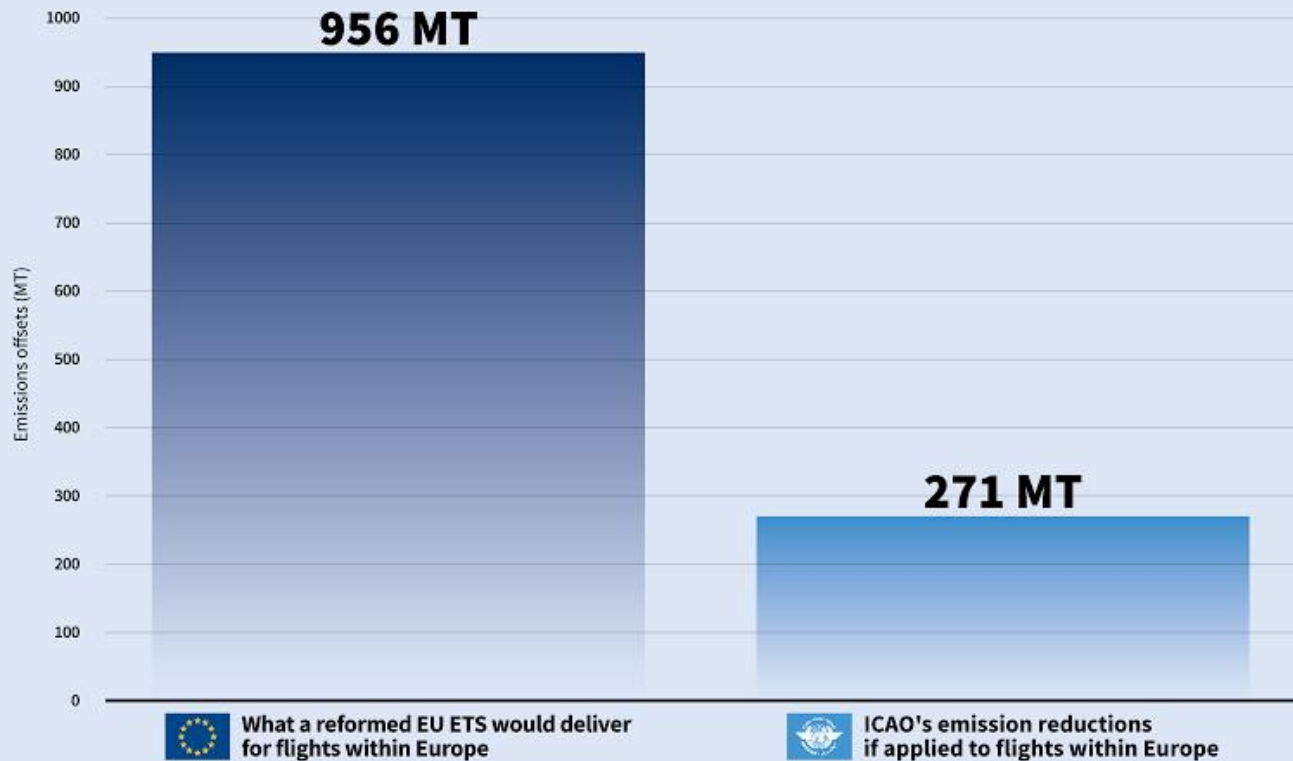
22%

ICAO's weak plan will offset only 22% of global emissions between 2021-2035

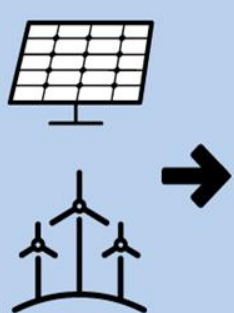
CORSIA V EU ETS

ICAO vs. ETS

Which one really mitigates aviation's climate impact?



How much land is needed to power 50% of EU aviation with alternative fuel in 2050?



Drop-in
liquid e-fuels

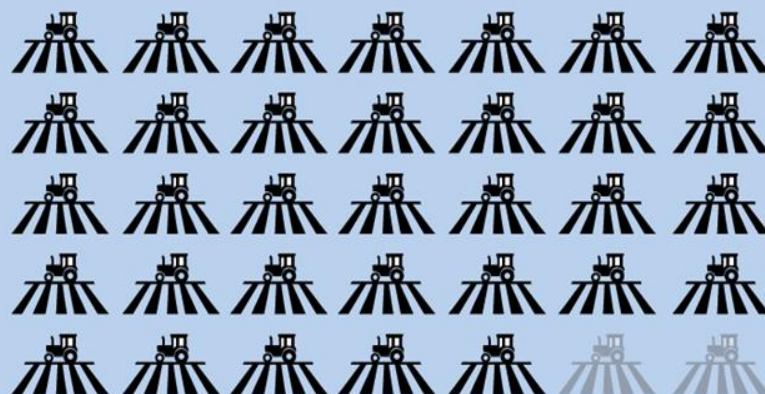


8 million hectares
any land

= the size of the Czech Republic



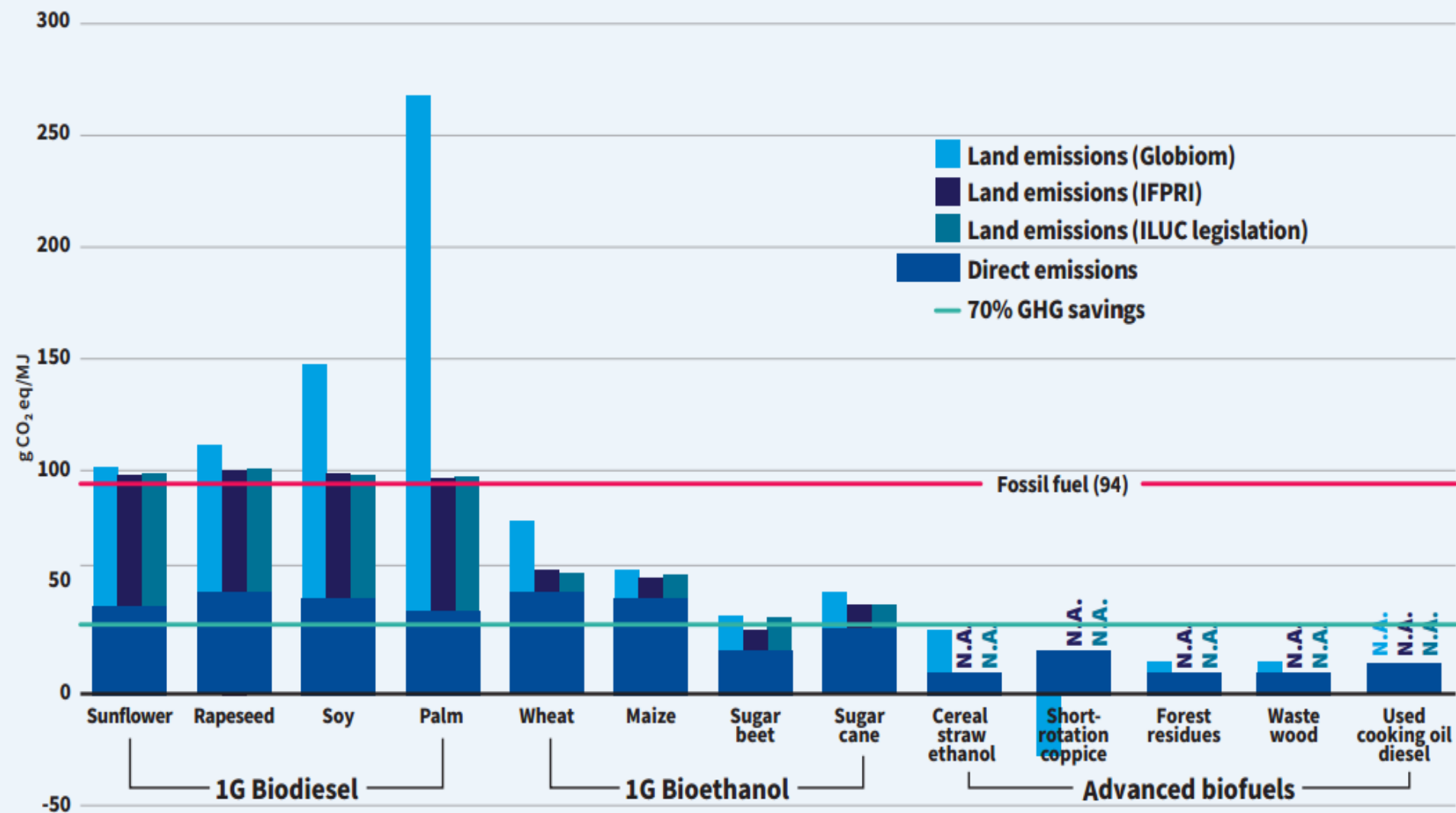
Crop
biofuels



33 million hectares
farmland

= the size of Finland

Direct emissions plus land emissions



1) Beskatning af flyvning

- a) Moms
- b) Kerosen-skat
- c) Passagerafgifter

2) Investér i e-fuels

3) Flyv mindre

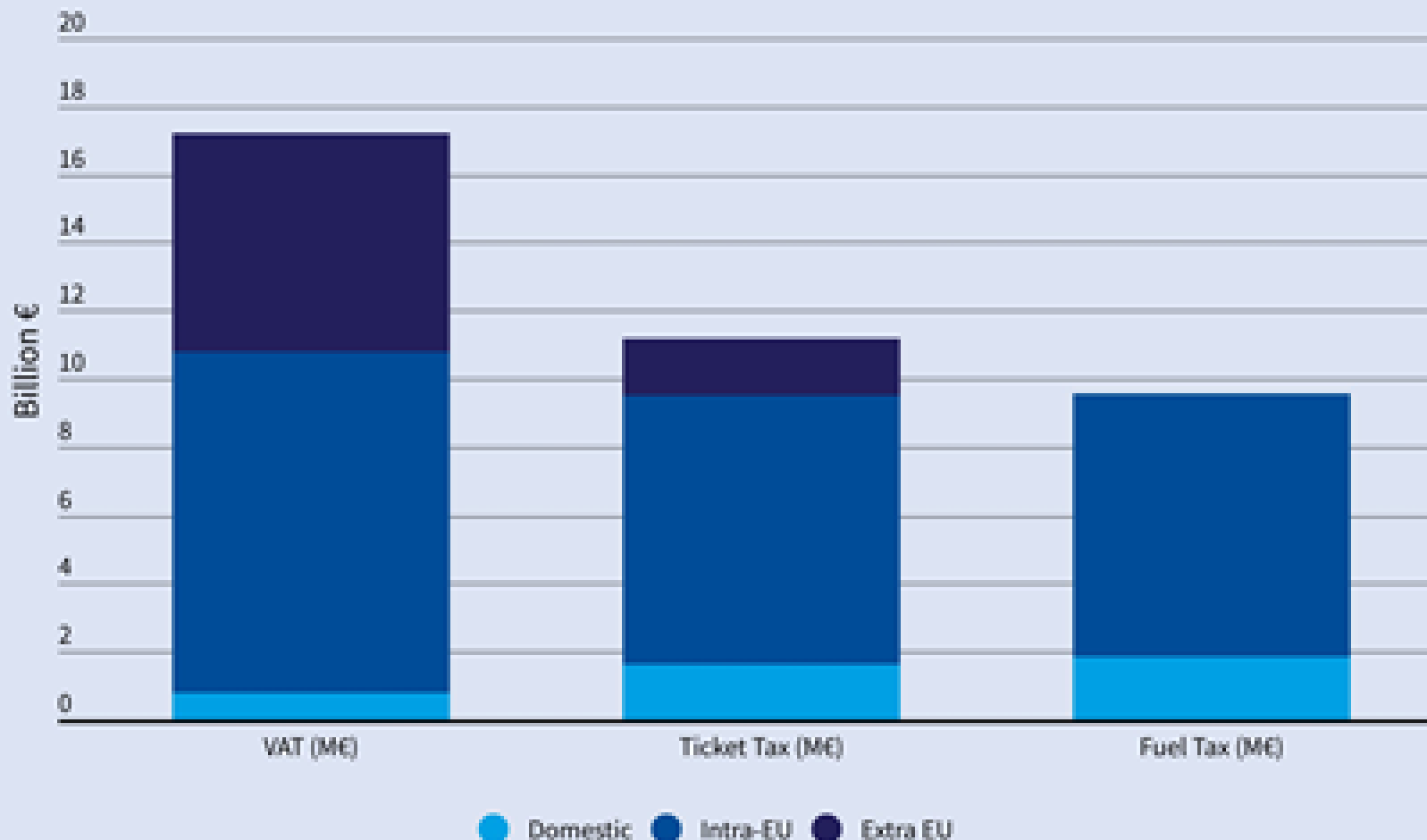
- a) Modal skift
- b) Nye muligheder

Brændstof beskatning

- Brasilien, Indien, Japan, og USA har alle indenlands brændstofbeskatning.
- Forbudt i EU (Energy Tax Directive) siden 2003
- Lovligt indenrigs - NL, NO
- Intra-EU bilateral beskatning tilladt efter 2003

Solution is ‘*de minimis*’ and bilateral waivers

Fuel tax, ticket tax, and VAT on EU aviation worth €38 bln



2015 passenger numbers. VAT set to 15%. Ticket tax is 10€ for domestic and intra-EU, €20 for extra-EU. Fuel tax levied at €0.33/L. Values calculated ceteris paribus - no demand reduction with price increase.

German Luftverkehrsabgabe

- Vedtaget i 2011 som indtægtskilde
- Passagertallet steg, men små lufthavne og lavprisselskaber fik færre kunder.
- 0.6% fald i udledning fra luftfart, 1-2m færre passagerer, næsten 1 mia euro i indtægter årligt

New Rate	Jan 2012 onward (lowest) ^[1]
Countries listed in <i>Anlage 1 zum LuftVStG</i>	EUR 7.50
Countries listed in <i>Anlage 2 zum LuftVStG</i>	EUR 23.43
all other Countries	EUR 42.18
children under 2 without seat	EUR 0.00

Svensk passageravgift

- 60, 120 og 400 SEK

Debatt

”The aviation industry always say no to taxes”

There is a great interest in Sweden which decisions will be taken regarding aviation tax. For European airlines, the resistance to air taxes is a top priority. But Sweden must resist industry pressure and intimidation, writes Andrew Murphy, from the independent European environmental organization Transport & Environment.

Whichever the country, the industry formula is the same: threaten job losses, say it'll destroy the economy, and claim it's not worth the hassle. Even better if an airline can threaten to shutter routes if governments don't back off. The aviation industry's opposition to ticket taxes, no matter how modest they might be, is the same across Europe.

FLY LESS, ENJOY MORE





**TRANSPORT &
ENVIRONMENT**

PROPULSION FUELS

- Biofuels in transport - bad experience on road
- Multiplier for aviation in REDDII; little impact
- Sustainable bio-based alt fuels - limited potential
- Power-to-Liquid - Fischer Tropsch
 - Drop-in fuel technology ready
 - Needs scaling - 5x times price gap
 - 1% mandate adds \$20 to \$500/tonne or €3.20/pax
 - Safeguards
 - But won't fix the non-CO2 problem....

FREQUENT FLYER LEVY

- 70% of flights taken by 15% of people (UK CAA Data)
- 57% of population don't fly at all in a year
- Issue of hypermobility - small number of people flying frequently

Solution: *Frequent flyer Levy?*

- Everyone gets 1 untaxed flight
- Tax kicks in at low amount and increases with each subsequent flight
- Spend money to green aviation

<http://afreeride.org/>
#afreeride

Industrien sagsøger

Country with ticket tax	Belgium	UK	The Netherlands	Ireland	Germany
Plaintiff	B.A.R. Belgium, Sabena and Lufthansa	Federation of Tour Operators	Maastricht Aachen Airport and Ryanair	Ryanair	American Airlines
Legal grounds opposition ticket tax	Art. 15 Chicago Convention	Art. 15 Chicago Convention, First Protocol (A1P1) to the European Convention on Human Rights, Art. 49 of the European Treaty.	Art.15 Chicago Convention; State aid due to exemption transfer passengers benefitting transfer hubs like Schiphol	State aid due to tax differentiation benefitting Irish airlines	Numerous violations of Chicago Convention, EU-USA Open Skies Agreement and Friendship, Commerce and Navigation Treaty
Result of case	Ticket tax abolished	All complaints dismissed	All complaints dismissed	European Commission required revision of differential tax rate	All complaints dismissed
Part of tax amended	Abolished	None	None	Distance element was removed	None
Tax status	Abolished	In place	Abolished	Set to Zero	In place

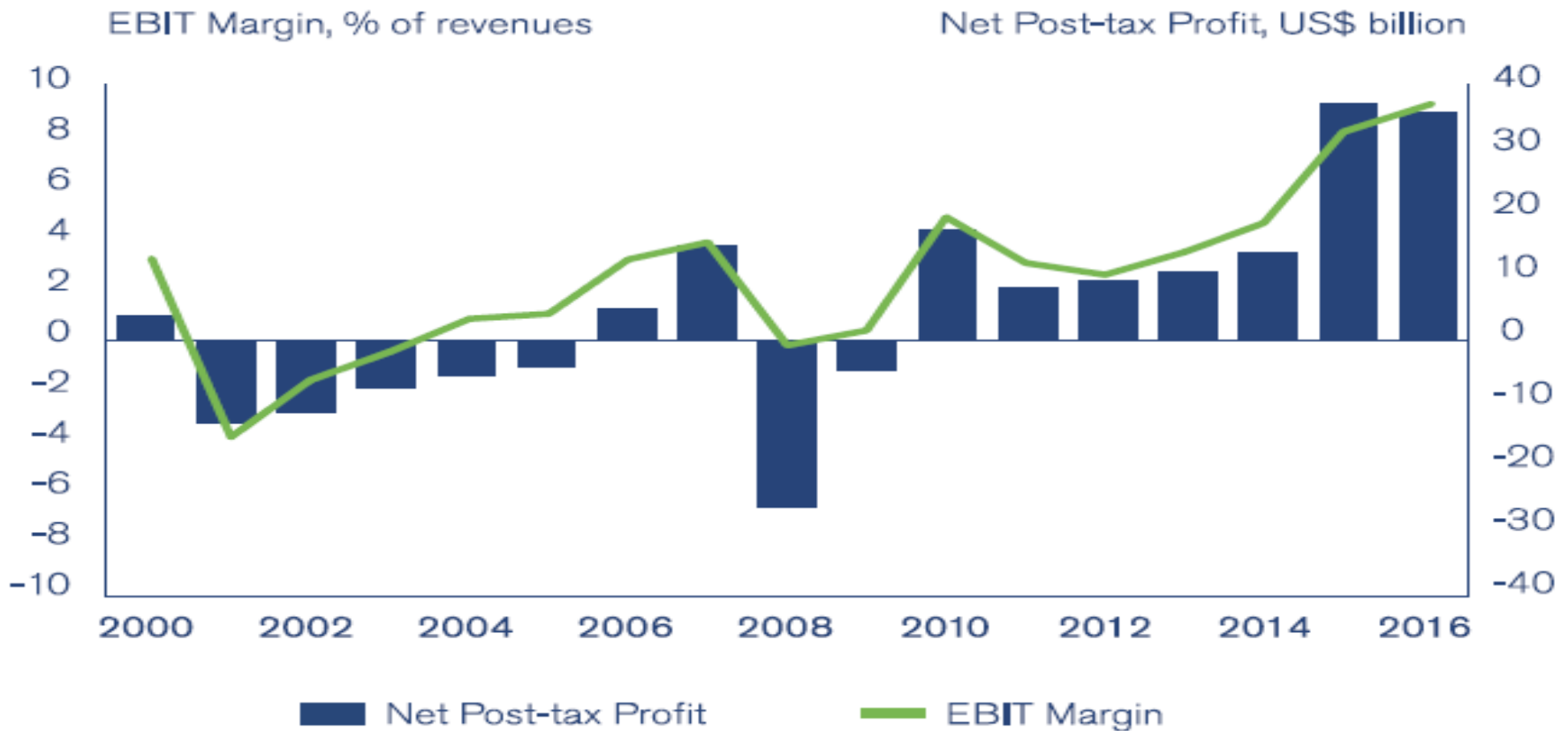
Hvem flyver?

Scheduled Revenue Passenger-Kilometres

International			Domestic			Total		
Rank	Airline	Millions	Rank	Airline	Millions	Rank	Airline	Millions
1	Emirates	270,797	1	American Airlines	205,679	1	American Airlines	320,044
2	United Airlines	145,470	2	Southwest Airlines ⁽²⁾	194,862	2	Delta Air Lines	308,088
3	Lufthansa ⁽⁴⁾	145,124	3	Delta Air Lines	175,588	3	United Airlines	299,080
4	Ryanair ⁽⁵⁾	142,740	4	United Airlines	153,610	4	Emirates	270,797
5	British Airways ⁽⁴⁾	140,668	5	China Southern Airlines ⁽⁴⁾	148,040	5	China Southern Airlines ⁽⁴⁾	205,720
6	Qatar Airways	137,603	6	China Eastern Airlines ⁽⁴⁾	85,407	6	Southwest Airlines ⁽²⁾	200,848
7	Delta Air Lines	132,502	7	Air China	75,239	7	Lufthansa ⁽⁴⁾	149,702
8	Air France ⁽⁴⁾	129,153	8	Hainan Airlines ⁽⁴⁾	66,509	8	British Airways ⁽⁴⁾	144,028
9	American Airlines	114,366	9	JetBlue	58,469	9	Ryanair ⁽⁵⁾	142,740
10	Cathay Pacific Airways	110,246	10	Alaska Airlines	50,665	10	China Eastern Airlines ⁽⁴⁾	138,042
11	Turkish Airlines	108,286	11	LATAM Airlines Group ⁽⁴⁾	50,624	11	Qatar Airways	137,603
12	KLM ⁽⁴⁾	97,676	12	Qantas Airways ⁽⁴⁾	42,571	12	Air France ⁽⁴⁾	136,659
13	Singapore Airlines	92,437	13	Shenzhen Airlines	39,789	13	Air China	135,464
14	Etihad Airways	89,480	14	IndiGo ⁽¹⁾	39,288	14	Turkish Airlines	125,098
15	Qantas Airways ⁽⁴⁾	77,458	15	All Nippon Airways ⁽⁴⁾	34,867	15	Qantas Airways ⁽⁴⁾	120,029
16	easyJet ⁽¹⁾⁽⁴⁾⁽⁵⁾	75,333	16	Sichuan Airlines ⁽¹⁾	33,311	16	LATAM Airlines Group ⁽⁴⁾	113,587
17	Korean Air	72,321	17	Spirit Airlines ⁽²⁾	31,622	17	Cathay Pacific Airways	110,246
18	Air Canada	69,321	18	Aeroflot Russian Airlines	29,351	18	KLM ⁽⁴⁾	97,676
19	LATAM Airlines Group ⁽⁴⁾	62,963	19	Gol Airlines	28,933	19	Air Canada	93,663
20	Air China	60,225	20	Lion Airlines ⁽³⁾	28,368	20	Singapore Airlines	92,437
21	Thai Airways International	57,711	21	Skywest Airlines ⁽²⁾	27,236	21	Etihad Airways	89,480
22	China Southern Airlines ⁽⁴⁾	57,680	22	Shandong Airlines	24,587	22	Aeroflot Russian Airlines	82,667
23	Aeroflot Russian Airlines	53,316	23	Air Canada	24,342	23	Hainan Airlines ⁽⁴⁾	82,290
24	China Eastern Airlines ⁽⁴⁾	52,635	24	Frontier Airlines ⁽²⁾	23,918	24	All Nippon Airways ⁽⁴⁾	79,099
25	Norwegian ⁽¹⁾⁽⁴⁾⁽⁵⁾	47,269	25	Virgin Australia	20,412	25	easyJet ⁽¹⁾⁽⁴⁾⁽⁵⁾	78,641

Skal vi have ondt af flyselskaberne?

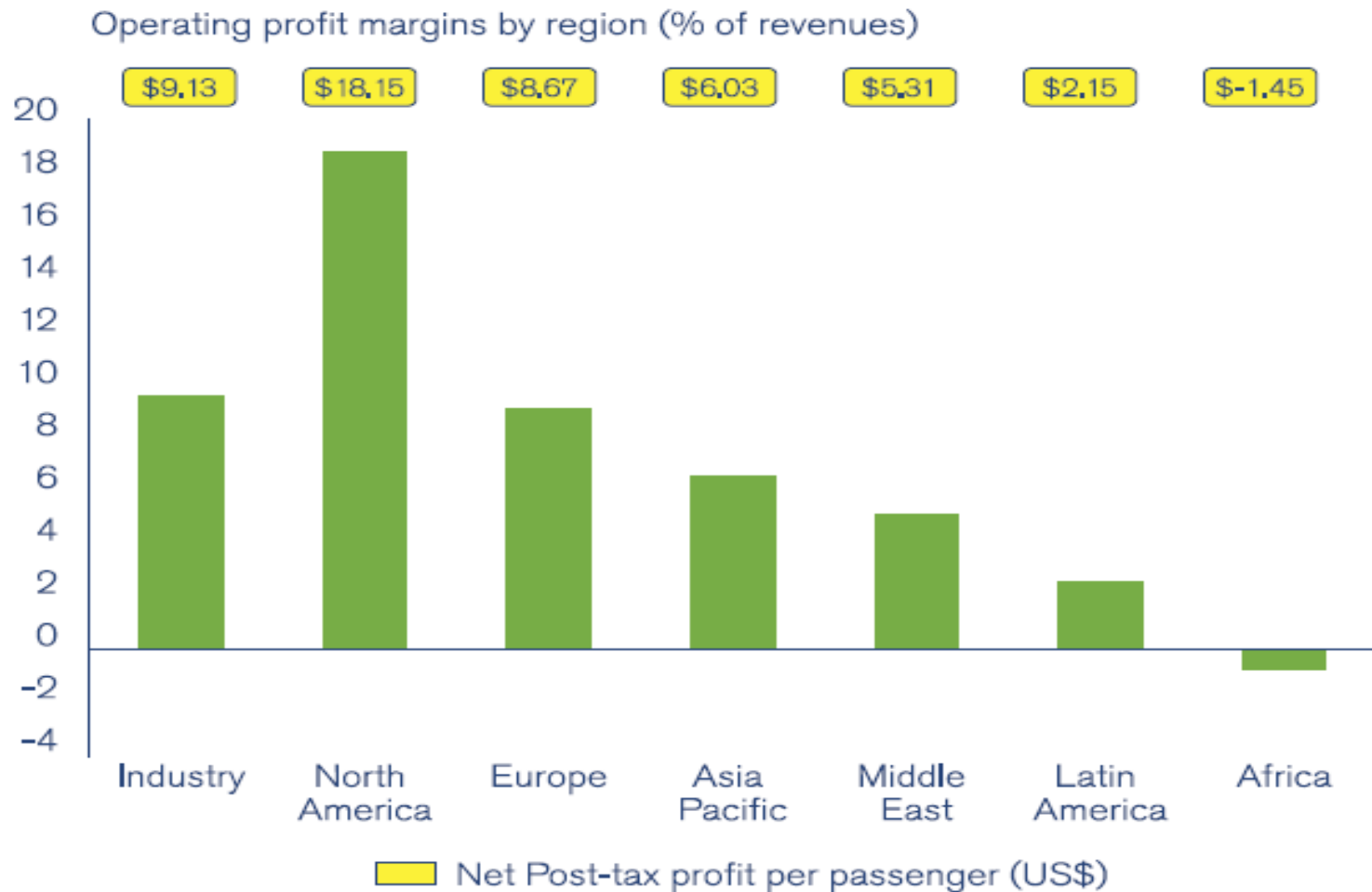
Global Commercial Airline Profitability



Source: IATA, ICAO

Hvad tjener de pr passager?

Operating Margin and Net Profit per Passenger by Airline Region of Registration



Source: IATA, ICAO

EU Budget (2021-2027) unique opportunity for reform aviation to pay for pollution & contribute tax revenue

Kerosene Taxes, VAT, Ticket taxes

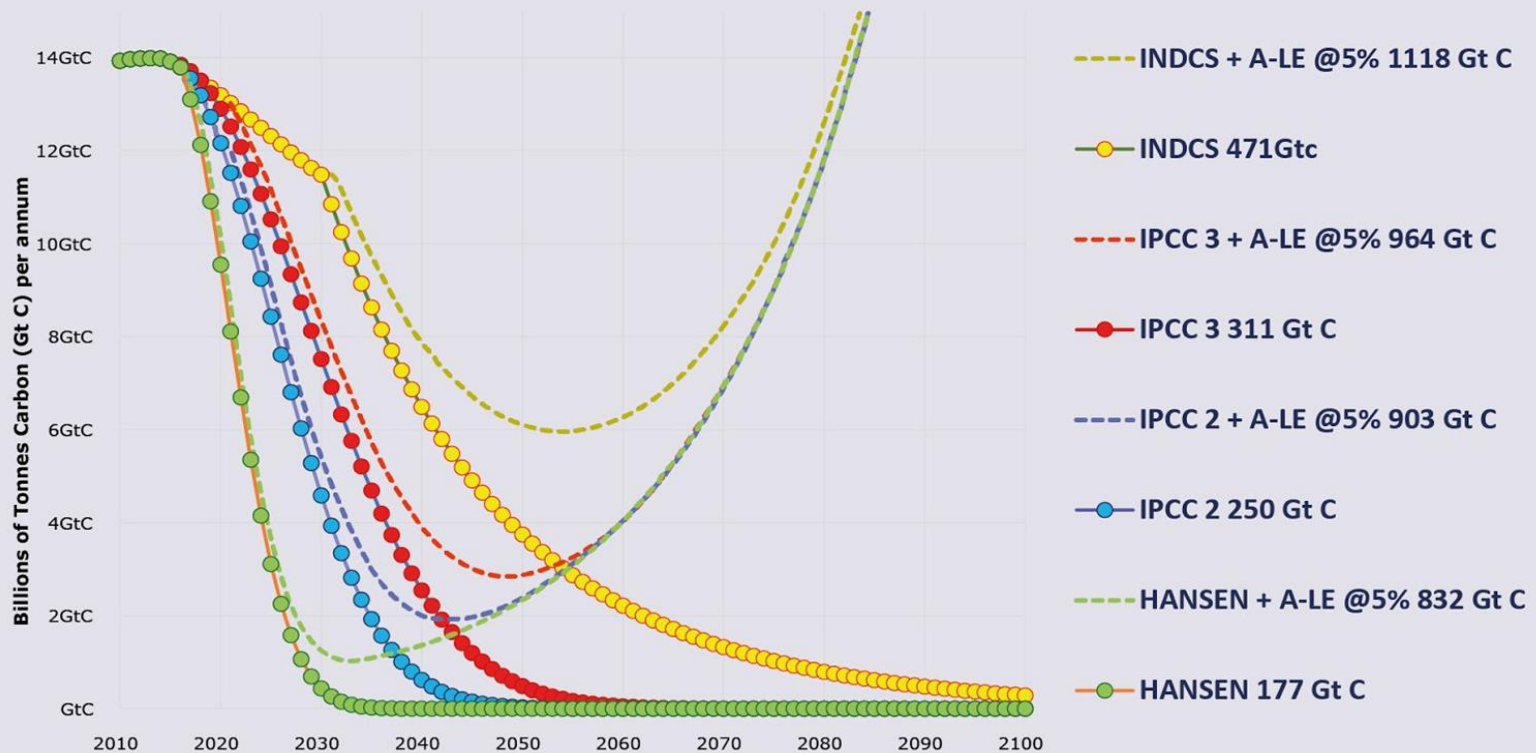
- Kerosene taxation limited by Energy Taxation Directive. Domestic only NO and NL
- Intra-EU flight tickets VAT exempt
- VAT rules now being reformed
- Ticket taxes exist in UK, Sweden, Norway, Germany, Austria, Sweden

Top European Airports

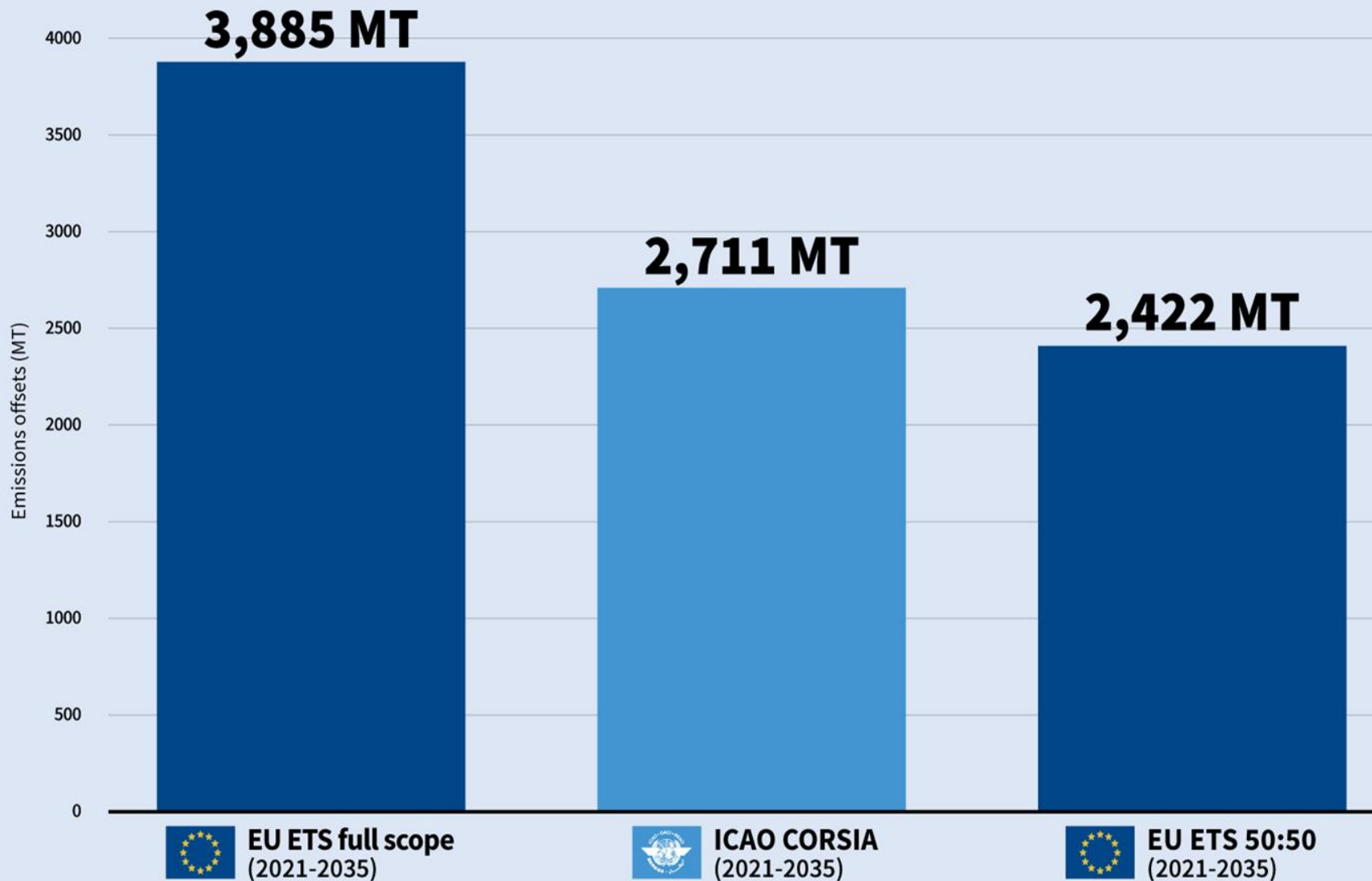
Rank	Airport	Total pax	People
1	London Heathrow Airport (United Kingdom)	77,987,524	65m
2	Paris Charles de Gaulle Airport (France)	69,471,442	65m
3	Amsterdam Airport Schiphol (Netherlands)	68,515,425	17m
4	Frankfurt Airport (Germany)	64,500,386	82m
5	Istanbul Atatürk Airport (Turkey)	63,727,448	83m
6	Madrid Barajas Airport (Spain)	53,402,506	46m

PARIS GOALS FOR AVIATION

COP-21 International INDCs & Global Carbon Budgets for 1.5° & 2.0°C compared to Air-Line Emissions (A-LE) continuing to grow @ 5.5%/year. Should this occur, A-LE would obviously negate the effects of any other emissions:temperature controls.



ICAO and EU systems compared



DECARBONISATION

- All current policies fall well short
- CORSIA doesn't even target aviation CO2
- EU ETS now has declining cap
- Non CO2 - ignoring the elephant
- Traffic growth far outstrips efficiency
- Technology - no quick fix; several generations
- Regulators powerless against the duopoly
- Sector is hopelessly undertaxed
- Fuels have some potential

CE Delft study; tax tax - do's & don'ts

- Ticket taxes don't contravene Chicago Convention
- ICAO resolutions against taxation non-binding - EU files reservation
- Exempt transfer/transit tax - double taxation
- Treat all EU airports the same - discrimination
- Distance bands
- No direct link to fuel burn

Brændstof

Biofuels in transport - bad experience on road

Multiplier for aviation in REDDII; little impact

Sustainable bio-based alt fuels - limited potential

Power-to-Liquid - Fischer Tropsch

Drop-in fuel technology ready TRL8

Needs scaling - 5x times price gap

1% mandate adds \$20 to \$500/tonne or €3.20/pax

Safeguards

Won't fix non-CO2...

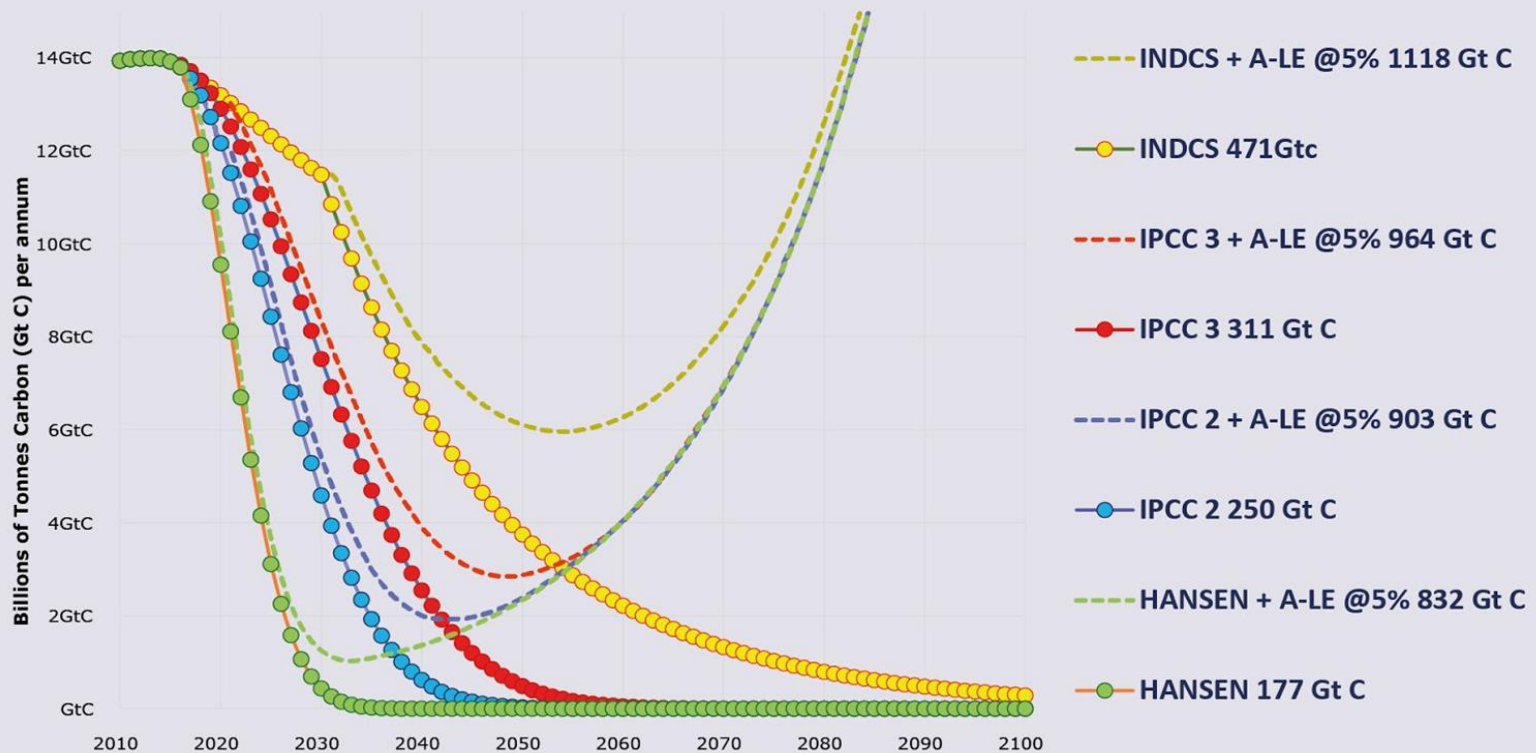
GROWTH OF EMISSIONS

- ETS is having only minor impact
- Traffic growth globally strongest ever >10%
- Emissions are growing at 3% per year globally according to IATA, 3-6% according to Larkin et al.
- Growth is 8% in Europe (2016)
- Boeing says transport doubling every 15 years on current trajectory (4.4% pa)
- Efficiency gains in aircraft around 1% & declining
- No silver bullet in engineering to decarbonise planes
- Alternative fuels expensive and not available at scale

THEREFORE: We must price aviation better...

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Ryanair's "route closing" argument

- Used to end Irish ticket tax in 2012
- Currently being used against Scottish government
- However used only against small nations: Ryanair currently expanding in Germany

5 MARCH 2018 COMMENT

Ryanair to slash Glasgow flights

By GlobalData

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Pilot shortages, bad weather and air control strikes forced Ryanair to cancel thousands of flights in 2017. Credit: Ryanair.

Ryanair Enters Two New German Airports Amid Mallorca Route Expansion

By Alliance | Mon, 26th February 2018 - 09:31



LONDON (Alliance News) - Ryanair Holdings PLC said Monday it will operate from two new airports in Germany from summer 2018 amid a wider expansion of German routes to Palma de Mallorca in Spain.

The Irish budget airline said it would operate from two new airports in Germany for the first time in summer 2018: Berlin's Tegel and Dusseldorf.

Ryanair also said four new German peak summer routes to Mallorca have been announced from Tegel, Dusseldorf, Nuremberg and Stuttgart. Further flights have also been introduced from Cologne and Dortmund.

"Ryanair is pleased to announce two new German airports on its S18 network with new Palma de Mallorca flights from Berlin (Tegel) and Dusseldorf," Ryanair Chief Commercial Officer David O'Brien said. "More German customers can now book their summer flights to Mallorca with new routes also operating from Nuremberg and Stuttgart. These new routes and extra flights will operate from June to August and are on sale from today on Ryanair.com."

In December 2017, rival budget airline easyJet PLC gained access to Tegel airport through its acquisition of part of defunct Air Berlin's operations at the Berlin airport. As part of the deal, FTSE 100-listed easyJet gained access to slots at Tegel.