

# Aviation Tax: Impulses and looking for the optimal response

Econ Jedi Council for Copenhagen Airports

CPH





# Levying a flat tax per flight departure on airlines imply beneficial incentives, much-needed public revenue, while having a minimal distortionary effect on danish economy of aeronautical transportation

Increasing demand for aeronautical transportation is great for business, but carries societal externality costs.

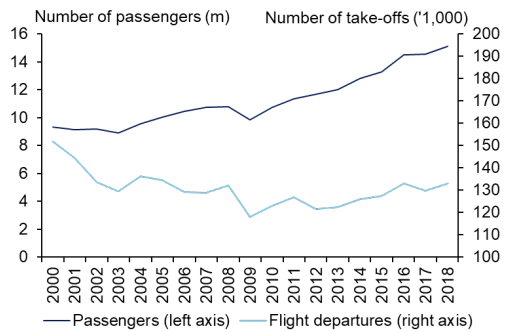
A trade-off emerges between improving on the green agenda, without choking-off businesses and hurting the economy.

We present a proactive agenda-setter strategy of gaining political influence at the cost of short-run revenues.

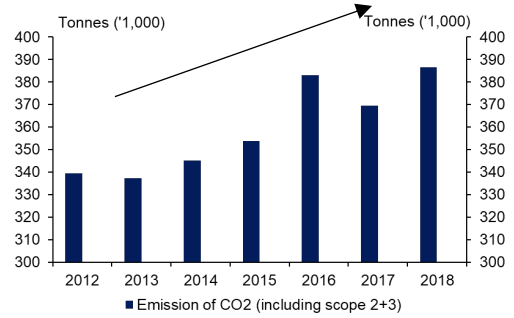
## Problem

CPHA is growing passenger throughput healthily, however at the cost of also increasing CPHA-caused emissions.

### CPHA's PAX and departures since 2000



### CO2-emissions from CPHA departures since 2012



Source: Copenhagen Airports, case material and own calculations

## Implication

Taxing leads to beneficial effects on society in terms of less pollution, healthier citizens and higher governmental revenues for future investments. However, it brings significant negative effects on CPHA and its collaborators in the short-run.

	<u>Society</u>	<u>CPHA</u>
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Tax revenues</li> <li>• Investment in green future</li> <li>• Health</li> </ul>	<ul style="list-style-type: none"> <li>• Agenda-setting</li> <li>• Green profile</li> <li>• Lowers risk of larger future taxes</li> </ul>
<b>Costs</b>	<ul style="list-style-type: none"> <li>• Negative for mobility</li> <li>• Bad for businesses</li> <li>• Less tourism</li> </ul>	<ul style="list-style-type: none"> <li>• Lower short-run revenues</li> <li>• Risks of shifts towards other forms of transportation in long-run</li> </ul>

## Solution

We propose a flat per-departure tax on airlines' long-haul flights, ultimately leading to:

### 1. Lower emissions

Taxing on a per-departure basis, we incentivize airlines to increase their load factor and cut long-haul flights, leading to lower carbon-emissions per passenger's flown kilometer.

Being a front-runner, CPHA will gain significant green brand-value and add to its progressive reputation.

### 2. Increasing government revenue

Levying a relatively flat tax on the least elastic demand-spheres, we gain considerable public revenues, allowing for reinvestment in R&D-activities.

Being a front-runner, CPHA is likely to be first in line of long-run benefits hereof.

### 3. Minimizing CPHA's revenue loss

Being a political first-mover and gaining the agenda-setter advantage, CPHA can trade lower short-run revenues for a lower risk of higher and less advantageous future tax levies in the longer run. This is a form of insurance.

# Assessing effect on CPHA financials from a tax-levy on aero-fares

Imposing taxation based on distance travelled...

... Calculating effects on business based on area-specific knowledge and assumptions...

... Enables us to evaluate financial consequences

	# Passengers:	×	% Price increase	×	Elasticity <sup>1)</sup>	=	Change in passenger throughput <sup>2)</sup>	Change in revenue	
								DKK (m)	% of location
Domestic	547,000		6% (DKK 45)		-1.4		-35,803	-12.5	-6,5%
EU	7,486,000		4% (DKK 45)		-1.2		-311,419	-108.6	-4,2%
North America	635,000		6% (DKK 290)		-1.1		-32,723	-11.4	-5.2%
Asia	620,000		7% (DKK 290)		-0.8		-25,530	-8.9	-4,5%

1) Overall elasticity has been calculated as a weighted average of estimated elasticities of business- and leisure travellers respectively, weighted by their share of the total passenger throughput.

2) We assume constant elasticity. A heroic, but necessary assumption.

# Assessing societal impact: CO2-emissions

Imposing taxation based on distance travelled...

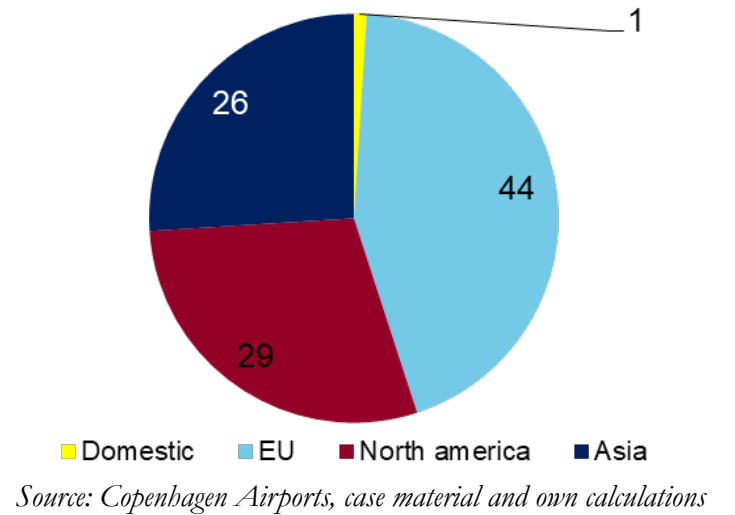
... Calculating effects on CO2-emission based on area-specific knowledge and assumptions...

... Enables us to evaluate societal consequences

$$\text{Change in passengers} \times \text{CO2 emission per passenger per km} \times \text{Average distance per flight (km)} = \text{Change in CO2 emission (tons)}$$

	Change in passengers	×	CO2 emission per passenger per km	×	Average distance per flight (km)	=	Change in CO2 emission (tons)
Domestic	-35,803		254		212		-1.932
EU	-311,419		254		960		-75.977
North America	-32,723		195		7,805		-49.801
Asia	-25,530		195		9,197		-45.334

Area-specific contributions to CO2-reductions if all taxes imposed



# Assessing societal impact: Tax revenues

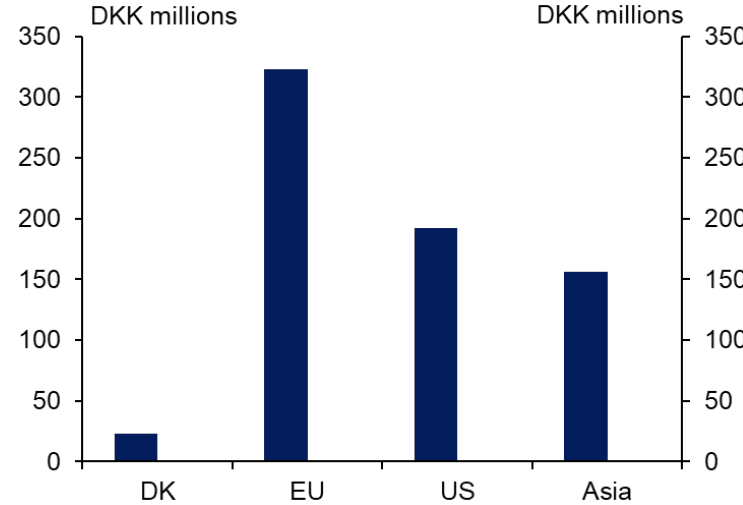
Imposing taxation based on distance travelled...

... Calculating effects on government revenue based on area-specific knowledge and assumptions...

... Enables us to evaluate societal consequences

	Passengers after imposed tax	×	Tax rates based on the Swedish tax rate in DKK	=	Government tax revenue in mill. DKK
Domestic	511,069		45		23
EU	7,174,221		45		322.8
North America (>6000 km)	661,810		290		191.9
Asia (>6000 km)	537,223		290		155.8

Area-specific tax revenue if all taxes imposed

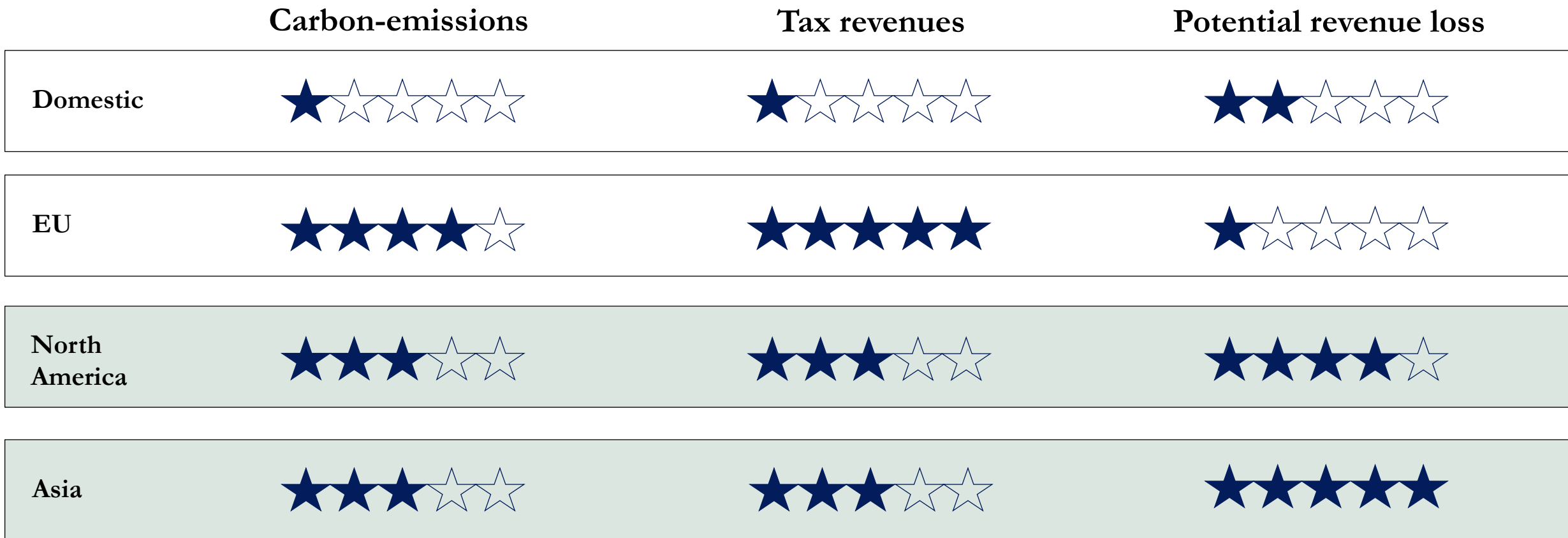


Source: Copenhagen Airports, case material and own calculations

# Imposing taxes on long-distance flights as a first move is the most financially beneficial for CPHA, while still having beneficial societal effects

Evaluating the overall effects on KPIs for evaluation of best solutions for both CPHA and society leads us to focus on imposing taxation on long-distance flights only as a first step. This is by far the most beneficial for company finances and is assumed to continue to be so, following the increasing trend of low-cost flying to closer locations.

In the same time, taxing only longer distances is a feasible plan politically, presenting good arguments to the public of cutting the most emitting flights, benefitting the european economy, etc.



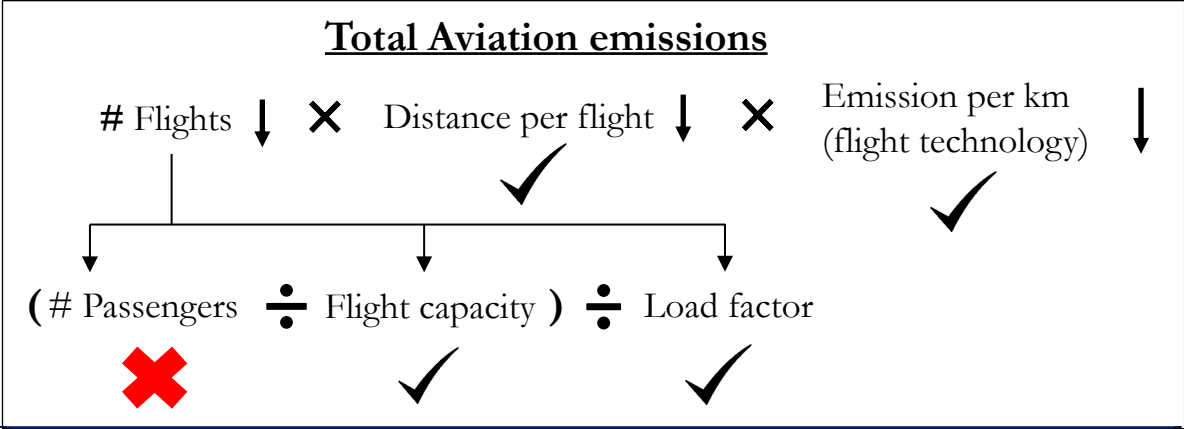
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# Considerations in designing the optimal response

Goal is to lower total danish aviation-caused carbon emissions, reaching government 2030-targets ...

... while maintaining Copenhagen Airports' strong bottom line



Revenue-KPI of interest: *Number of passengers*

As revenues from both Aeronautical and non-aeronautical segments are mainly determined by number of passengers travelling through the airport, this is Copenhagen Airports' main variable of interest.

Revenues: Dependence on number of passengers:

Of the directly dependent...

■ Directly dependant ■ Not directly dependant      ■ Flight ■ Shopping ■ Parking ■ Hotels ■ Other

Source: Copenhagen Airports' Annual Report. Numbers are revenue in millions

Takeaway: Factors of interest, keeping **number of passengers** constant:

- Decrease: Distance per flight, emissions per kilometer flown
- Increase: Flight capacity, load factor

Strategic opportunity:

Question: How can we bring Denmark's aerial traffic into a greener future, without hurting danish businesses and growth?

Answer: By engaging **proactively** in policy making, CPHA can:

1. Become an **agenda-setter**, affecting policy directions
2. Increase green **brand-value** and ride a growing wave
3. Become the first in line to gain **benefits of green transition** in the long-run

# Nailing the trade-off by imposing only long-distance taxation

**Introducing a distance-dependent per-flight takeoff-tax** By being a front-runner in the idea-generation, design and implementation of the green aerotax-scheme, CPHA will have a say in how the tax is formed and whom it affects. Most importantly, it lets CPHA be first in line for future investments and improvements.

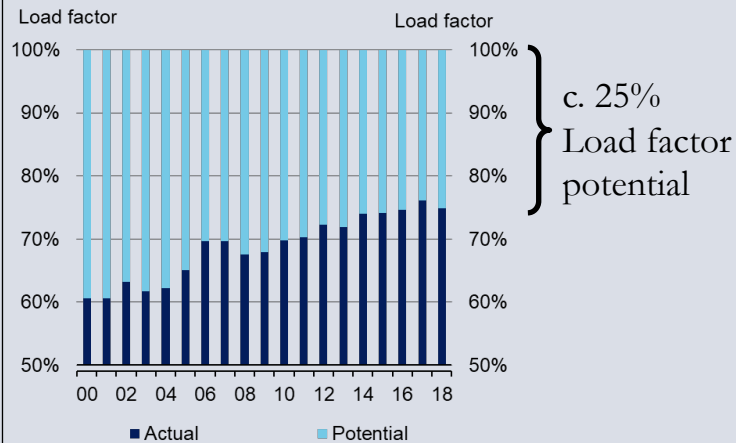
## 1 Lowering emissions

Basing taxation on **number of lift-offs** creates beneficial incentive-schemes for airlines:

### Incentivizing:

1. load-factor increase: Filling up the aircrafts
2. Fewer planes lifting off
3. Shorter distances flown

### Lowering carbon-emissions



## 2 Increasing tax revenue

Tax-imposing raises large amounts of capital, allowing for green reinvestments into the aeronautical sector, benefitting in the long-run.

We propose setting up a new **Public Green Transportation Fund (PGTF)**, investing revenues from taxation of the transportation sector into **R&D** and **infrastructural projects**.

### Green investments result in:

1. **Lower emissions per flown kilometer** (in-air transportation)
2. **Lower emissions per driven kilometer** (on-ground transportation)
3. **Larger capacity airplanes** (lower emission per passenger)

## 3 Minimizing revenue loss

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## 1 Lowering emissions

When imposing taxes on long haul flights we see the following effects:

A yearly drop in passengers by 85,000



A CO<sub>2</sub>-emission drop of 5,4 percent on long haul flights

## 2 Increasing tax revenue

The tax imposed will be payed by 1,49 million passengers



This raises the government revenue by 431,4 million DKK



The tax revenue can be reinvested in R&D and contribute to lowering CO<sub>2</sub>-emission even further through better flight technology.

## 3 Minimizing revenue loss

By only taxing the long haul flights the revenue loss is estimated to 27 mill. DKK.

Compared to taxing european flights with a revenue loss of 108,6 mill. DKK, long haul taxation is more effecient when minimizing the revenue loss.