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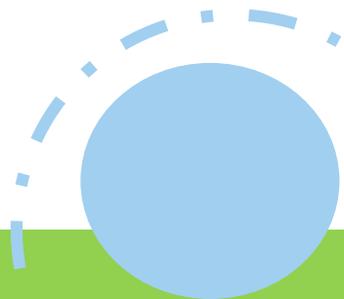
# CORSIA Offsetting requirements: calculations

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***ICAO/SASO ENV Workshop***

***Mbabane, Eswatini (24-27 Oct 2023)***

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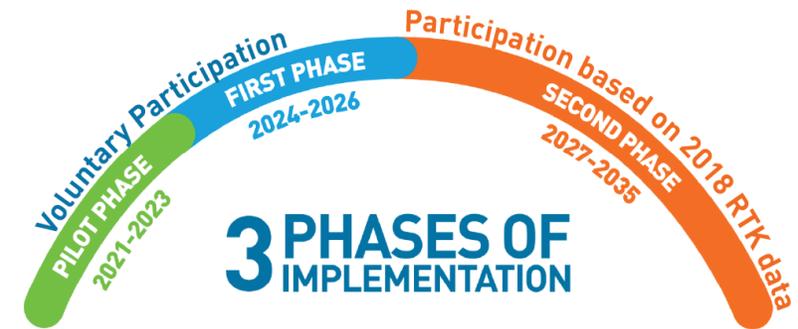


## Offsetting requirements shall be applicable:

- From 01 January 2021 to 31 December 2035;
- To an Aeroplane Operator (AO) with international flights as defined between States defined in the ICAO document entitled, “CORSIA States for Chapter 3 State Pairs.”

## States that have notified ICAO of their decision to voluntarily participate

- Shall be included in the ICAO document entitled, “CORSIA States for Chapter 3 State Pairs.”
- The doc will also contain States which meet the compliance criteria for Phase II (from 01 Jan 2027- 31 Dec 2035)-with the exception of LDCs, LLDCs and SIDS.





# *What is offsetting and how does it work?*

- Offsetting
  - through the purchase and cancellation of emissions units:
- Different sources of emissions reductions (mechanisms, programmes, projects)
  - Buying and selling of eligible emissions units through the carbon market
    - Price of the emissions units influenced by law of supply and demand
- “Cancelling”
  - means the permanent removal and single use of an emissions unit.
    - Done after an aeroplane operator has purchased emissions units from the carbon market



# Sector-wide offsetting requirements

- Route-based;
- For each given year

- Total amount of sector-wide offsetting requirements in a given year  $y$  (from 2021) under CORSIA

1. Calculate the 2019 to 2020 average levels of sector-wide emissions, with the route-coverage by CORSIA in year  $y$
2. Calculate the year  $y$  levels of sector-wide emissions, with the route-coverage by CORSIA in year  $y$
3. Difference between 1 and 2 is the total amount of sector-wide offsetting requirements in year  $y$





## Recap: First CORSIA periodic review in 2022 during A41

### 1. CORSIA Baseline (Paragraph 11)

Baseline **for** the Pilot Phase (Paragraph 11)

- 2019 emissions

CORSIA Baseline **after** the Pilot Phase (2024-2035)

- 85% of 2019 emissions

### 2. Offsetting Requirements: % Sectoral/ % Individual

(Paragraph 11)

– For 2021-2029

- Remained 100% sectoral growth

– For 2030-2032

- 100% sectoral growth
- *(Previously included at least 20% individual)*

– For 2033-2035

- 85% sectoral growth/ 15% individual growth
- *No longer 30% sectoral and 70% Individual*



## CORSIA Offsetting requirements

The State will calculate the AO's amount of CO<sub>2</sub> emissions required to be offset in a given year from 01 Jan 2021-31 Dec 2032 prior to consideration of CORSIA eligible fuels, as follows:

$$OR_y = OE \times SGF_y$$

Sector's Growth Factor (SGF):

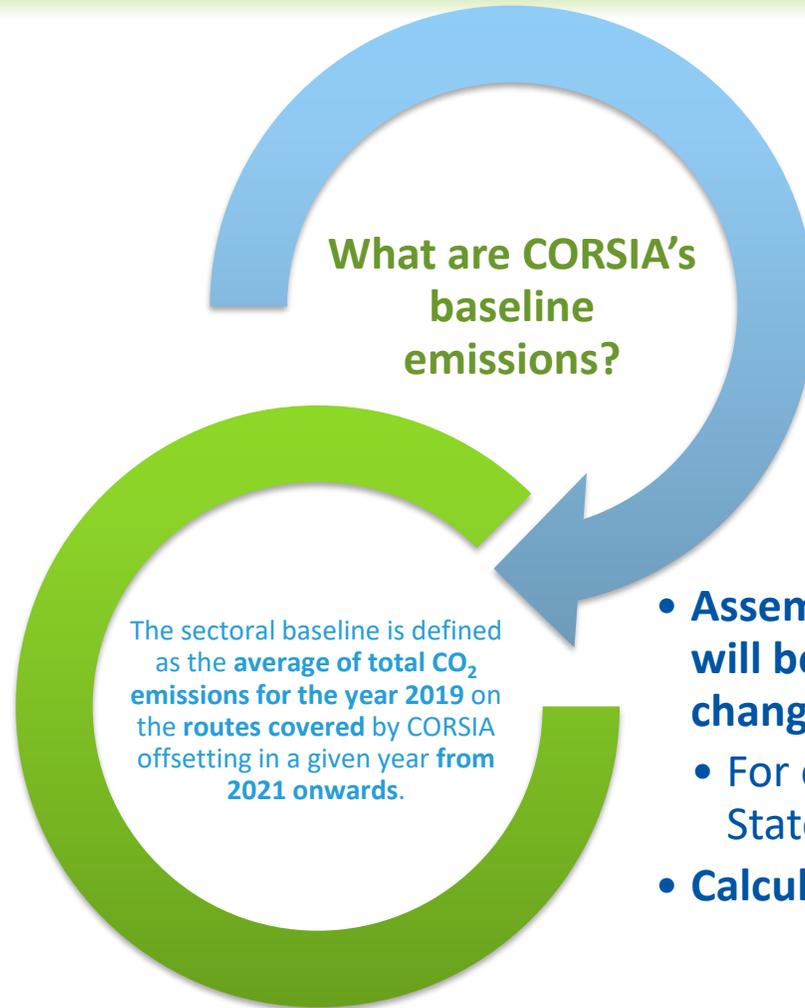
$$SGF = \frac{(SE_y - SE_{B,y})}{SE_y}$$

The State will calculate the AO's amount of CO<sub>2</sub> emissions required to be offset in a given year (y) from 01 Jan 2033 -31 Dec 2035 prior to the consideration of CORSIA eligible fuels, every year as follows:

$$OR_y = \%S_y * (OE_y \times SGF_y) + \%O_y * (OE_y \times OGF_y)$$



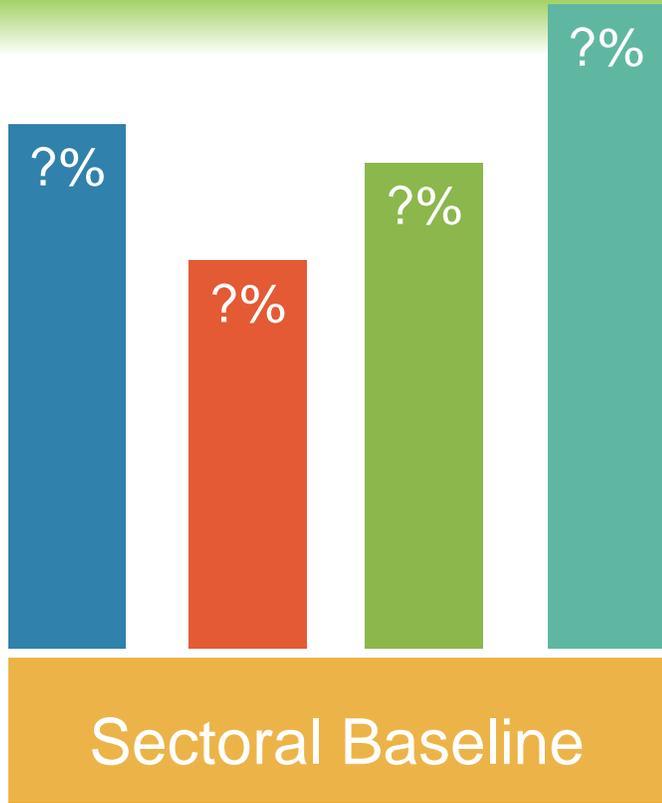
# The Baseline



- **Assembly Resolution A41-22 notes that the sectoral baseline will be re-calculated when the routes included in the CORSIA change.**
  - For example, when new States volunteer to participate or States decide to withdraw their participation.
- **Calculation of the baseline will be done by ICAO**



# CO<sub>2</sub> Offsetting Requirements: Baseline



The 2019 emissions from routes covered by CORSIA in a given year (from 2021)

$$SE_B = 2019 \text{ emissions}$$

Will need to be recalculated when the routes included in CORSIA change e.g. when new States volunteer to participate



# Calculation of an aeroplane operator's offsetting requirements



- Paragraph 11 of the Assembly Resolution A41-22
  - addresses the distribution of the total amount of CO<sub>2</sub> emissions to be offset in a given year among individual aeroplane operators.
  - This is accomplished by introducing a dynamic approach for the distribution of offsetting requirements, which takes into account:
    - **The Sector's Growth Factor:** *represents the international aviation sector's global average growth of emissions in a given year.*
    - It will be applied as a common factor for all individual operators participating in the scheme for the calculation of their offsetting requirements. ICAO will calculate the Sector's Growth Factor every year based on the reported CO<sub>2</sub> emissions data from States to ICAO; and
    - **The Individual Growth Factor:** *represents an individual operator's growth factor of emissions in a given year.*



# Calculation of an aeroplane operator's offsetting requirements



- The ICAO Assembly, having considered the recommendations from the Council arising from the 2022 CORSIA periodic review,
  - adopted Resolution A41-22, which establishes adjustments to the calculation of offsetting requirements, as follows:
    - From 2021 to 2032, a **100 per cent sectoral approach** (and 0 per cent individual approach) will be applied. This applies to the pilot phase, the first phase, and the first and second compliance periods of the second phase;
    - During the third compliance period of the second phase (2033 to 2035), **15 per cent** of offsetting requirements would be calculated **according to the "individual approach"** and **85 per cent according to the sectoral approach**.

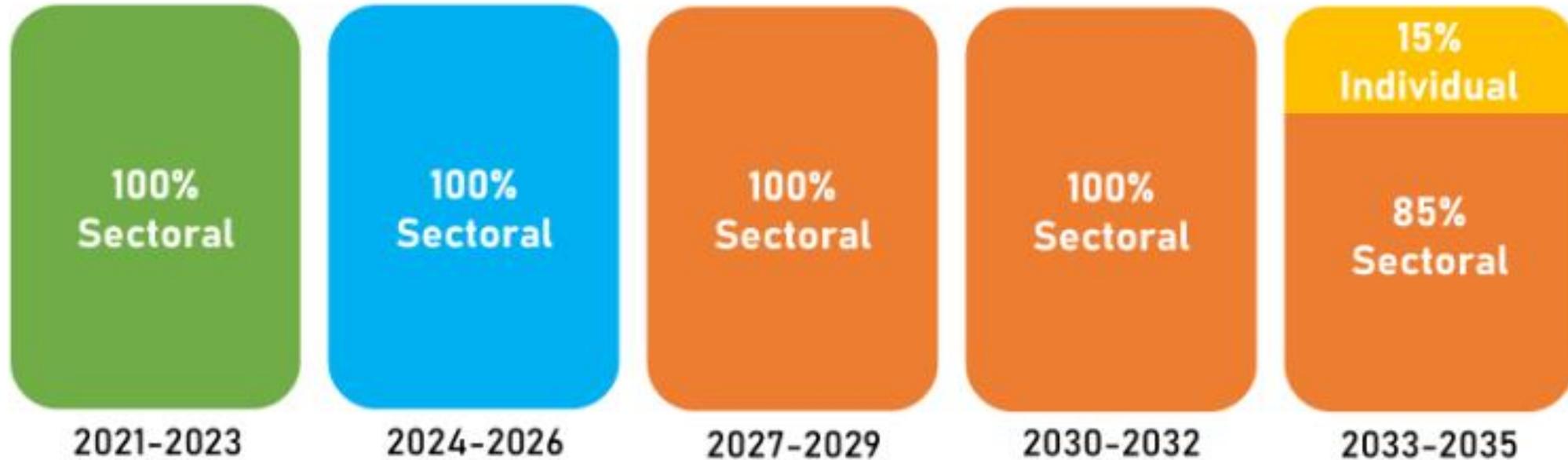


# Calculation of an aeroplane operator's offsetting requirements



$$\text{Operator's Annual CO}_2 \text{ Offsetting Requirements} = \text{Operator's Annual CO}_2 \text{ Emissions subject to Offsetting Requirements} \times \text{Growth Factor}^*$$

\* The Growth Factor changes every year taking into account the annual Sector's Growth Factor, which is calculated by ICAO, and (for 2033-2035) the individual operator's growth factor as shown below.





- Paragraph 15 of the Assembly Resolution A41-22 determines that CORSIA has **three-years compliance cycles** (also referred to as a compliance period), for which the operators need to reconcile their offsetting requirements. The compliance periods are:
  - Compliance period 1: years 2021 – 2023;
  - Compliance period 2: years 2024 – 2026;
  - Compliance period 3: years 2027 – 2029;
  - Compliance period 4: years 2030 – 2032;
  - Compliance period 5: years 2033 – 2035.
- It should be noted that an operator will report its CO<sub>2</sub> emissions on an annual basis, corresponding to calendar years.
- See question 3.68 for more information on the relationship between CORSIA's compliance periods and reporting periods.



# The relationship between CORSIA's compliance periods and reporting periods.

- Are the reporting periods and compliance periods the same for all operators?
  - Yes. All aeroplane operators are subject to the same reporting and compliance periods.
  - Reporting periods are annual and correspond to calendar years.
  - Compliance periods for offsetting requirements are 3-year periods, with the first period starting on 1 January 2021 and ending on 31 December 2023.



# Offsetting Requirements for AOs

The State will calculate the AO's amount of CO<sub>2</sub> emissions required to be offset in a given year from 01 Jan 2021-31 Dec 2023 prior to consideration of CORSIA eligible fuels, as follows:

$$OR_y = OE \times SGF_y$$

Where:

$OR_y$

AO's offsetting requirements in the given year y;

$OE$

AO's CO<sub>2</sub> emissions covered in the given year y or AO's CO<sub>2</sub> emissions covered by a State in 2020, depending upon the option selected by the State which will be applied to all AOs that have been attributed to it; and

$SGF_y$

Sector's Growth Factor.

*The  $SGF_y$  will be provided by ICAO in the ICAO document entitled, "CORSIA Annual Sector's Growth Factor (SGF)"*



$$OR_y = OE \times SGF_y$$



01

The State will use the SGF applicable for any given year (SGF<sub>y</sub>) and this will be provided in the ICAO Doc entitled, "CORSIA Annual Sector's Growth Factor (SGF)"

02

Sectoral emissions in a given year (SE<sub>y</sub>) do not include the CO<sub>2</sub> emissions from new entrants during their exception period

- Sector's Growth Factor (SGF):

$$SGF = \frac{(SE_y - SE_{B,y})}{SE_y}$$

*SE<sub>B</sub> = 2019 emissions*

Where:

SE<sub>y</sub> = total sectoral CO<sub>2</sub> emissions covered in the given year y

SE<sub>B,y</sub> = total annual sectoral CO<sub>2</sub> emissions during 2019 covered in the given year y



## Offsetting Calculations

# EXAMPLE



# Offsetting requirements



**Calculate a) –c) given that:**

Operator Offsetting Requirements (2021-2032):  $\longrightarrow$  *100% sectoral growth/0% individual*

•  $OR_y = OE_y \times SGF$

	Baseline	Year Y	Growth factor Year Y	Offsetting requirements in year Y (0% individual; 100% sectoral) (2021-32)
Airline X1	100	125	20%	a)
Airline Y1	100	105	4.8%	b)
International Aviation Sector	200	230	13%	c)



# Offsetting requirements



Operator Offsetting Requirements (2021-2032):  $\longrightarrow$  100% sectoral growth/0% individual

- $OR_y = OE_y \times SGF$

	Baseline	Year Y	Growth factor Year Y	Offsetting requirements in year Y (0% individual; 100% sectoral) (2021-32)
Airline X1	100	125	20%	16
Airline Y1	100	105	4.8%	14
International Aviation Sector	200	230	13%	30

$$125 \times \left( \frac{230 - 200}{230} \right)$$

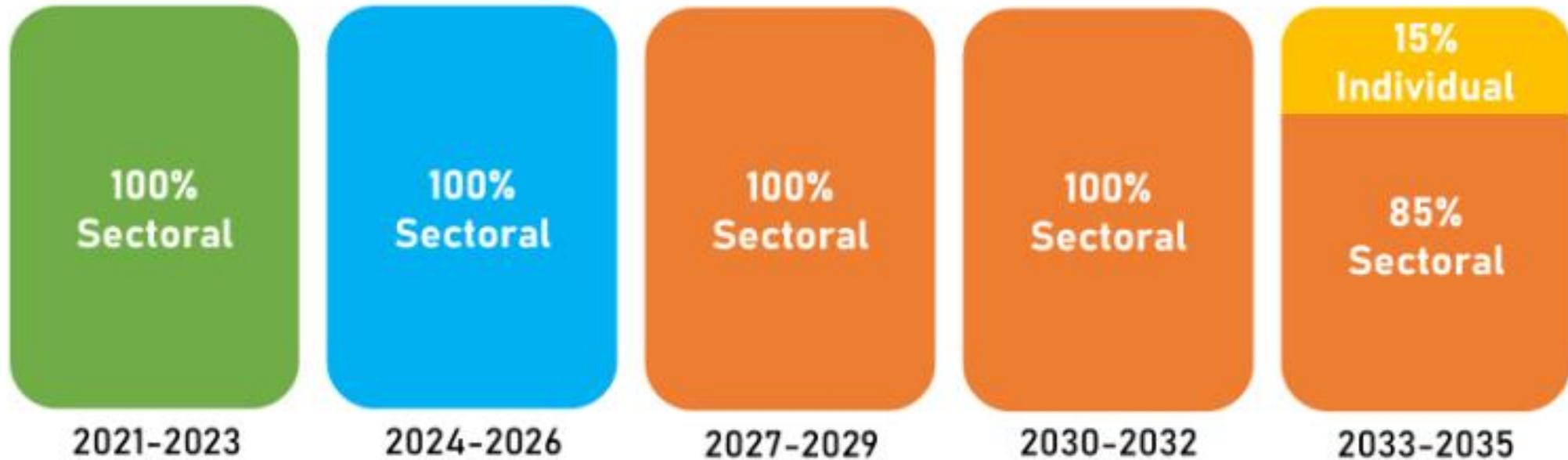
$$\left( \frac{230 - 200}{230} \right)$$



# Recap: Calculation of an aeroplane operator's offsetting requirements



\* The Growth Factor changes every year taking into account the annual Sector's Growth Factor, which is calculated by ICAO, and (for 2033-2035) the individual operator's growth factor as shown below.





- **Dynamic approach**-the quantity of an operator's offsetting requirements in a given year  $y$  ( $OR_y$ ) from 2030 will be calculated based on the sectoral growth and individual growth
- For 2033-2035
  - 85% sectoral growth/ 15% individual growth
  - *No longer 30% sectoral and 70% Individual*

The State will calculate the AO's amount of CO<sub>2</sub> emissions required to be offset in a given year ( $y$ ) from 01 Jan 2033 -31 Dec 2035 prior to the consideration of CORSIA eligible fuels, every year as follows:

$$OR_y = \%S_y * (OE_y \times SGF_y) + \%O_y * (OE_y \times OGF_y)$$



# Offsetting requirements



The State will calculate the AO's amount of CO<sub>2</sub> emissions required to be offset in a given year (y) from 01 Jan 2033 -31 Dec 2035 prior to the consideration of CORSIA eligible fuels, every year as follows:

$$OR_y = \%S_y * (OE_y \times SGF_y) + \%O_y * (OE_y \times OGF_y)$$

	Baseline	Year Y	Growth factor Year Y	Offsetting requirements in year Y (15% individual; 85% sectoral) (2033-35)
Airline X1	100	125	20%	a) ???
Airline Y1	100	105	4.8%	b) ???
International Aviation Sector	200	230	13%	c) ???



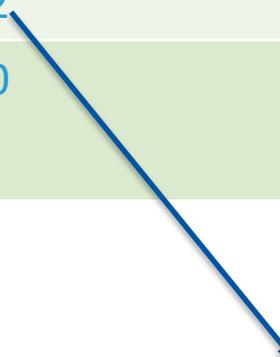
# Offsetting requirements



## Operator Offsetting Requirements 2033-35:

$$OR_y = 85\% * [OE_y * (\frac{SE_y - SE_B}{SE_y})] + 15\% * [OE_y * (\frac{OE_y - OE_B}{OE_y})]$$

	Baseline	Year Y	Growth factor Year Y	Offsetting requirements in year Y (15% individual; 85% sectoral) (2033-35)
Airline X1	100	125	20%	???
Airline Y1	100	105	4.8%	12
International Aviation Sector	200	230	13%	30



$$85\% * \left[ 105 * \frac{(230 - 200)}{230} \right] + 15\% * \left[ 105 * \frac{(105 - 100)}{105} \right]$$



# Costs for Offsetting requirements

Cost related to the emissions (*for illustrative purposes*)

	Baseline	Year Y	Growth factor Year Y	Offsetting requirements in year Y (0% individual; 100% sectoral) (2021- 29)	If one EU cost \$5
Airline X1	100	125	20%	16	a) ???
Airline Y1	100	105	4.8%	14	b) ???



# Costs for Offsetting requirements



Cost related to the emissions (*for illustrative purposes*)

	Baseline	Year Y	Growth factor Year Y	Offsetting requirements in year Y (0% individual; 100% sectoral) (2021-29)	If one EU cost \$5
Airline X1	100	125	20%	16	<b>16 X 5= \$80</b>
Airline Y1	100	105	4.8%	14	<b>14 X 5= \$70</b>



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# Questions?



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Thank You