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Institut für angewandte Ökologie
Institute for Applied Ecology

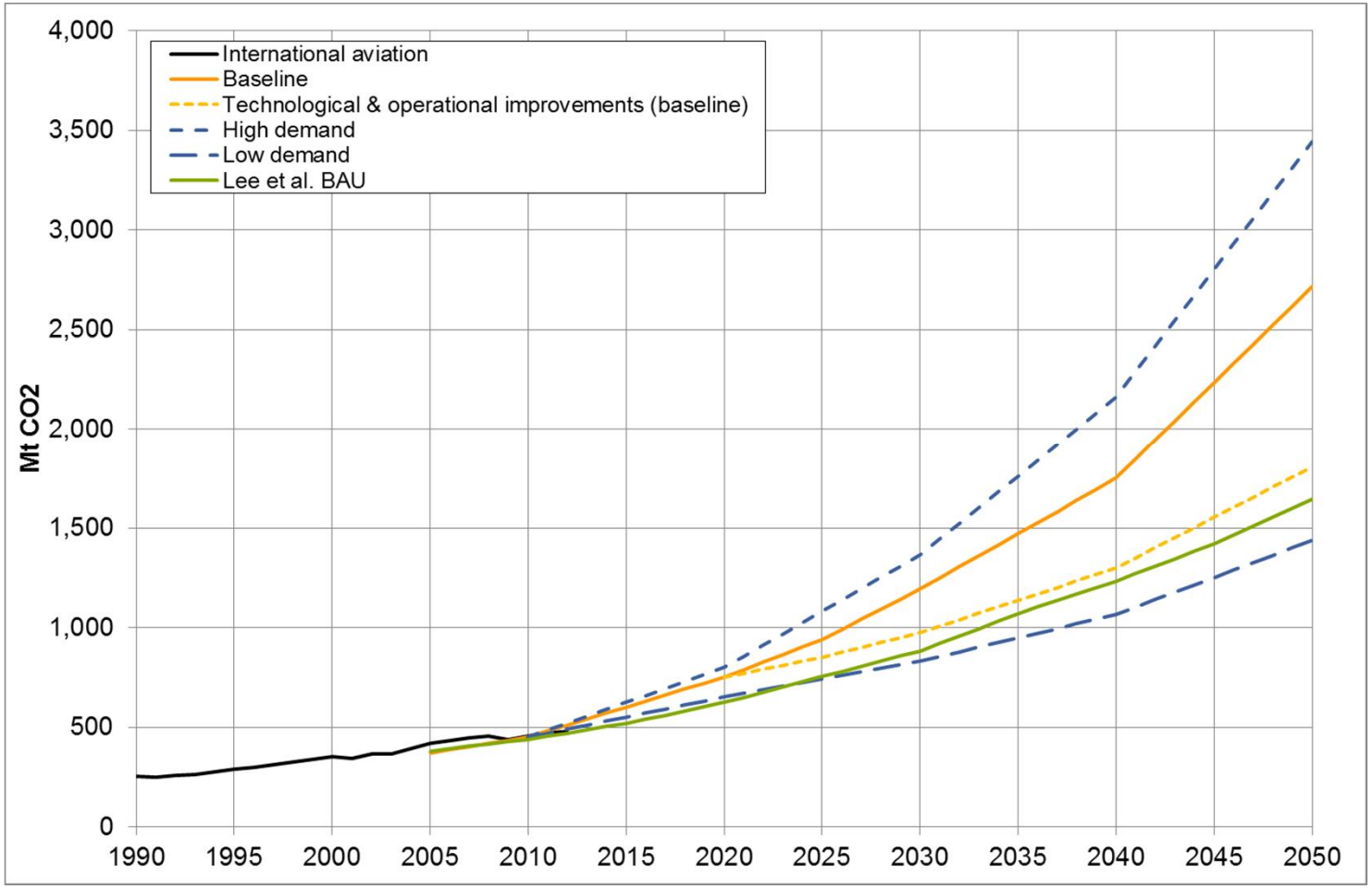
IMO and ICAO emissions trajectories

ICAO and IMO after Paris: Did they deliver?
Side event at COP 22, Marrakech, 16/11/2016

Dr. Martin Cames

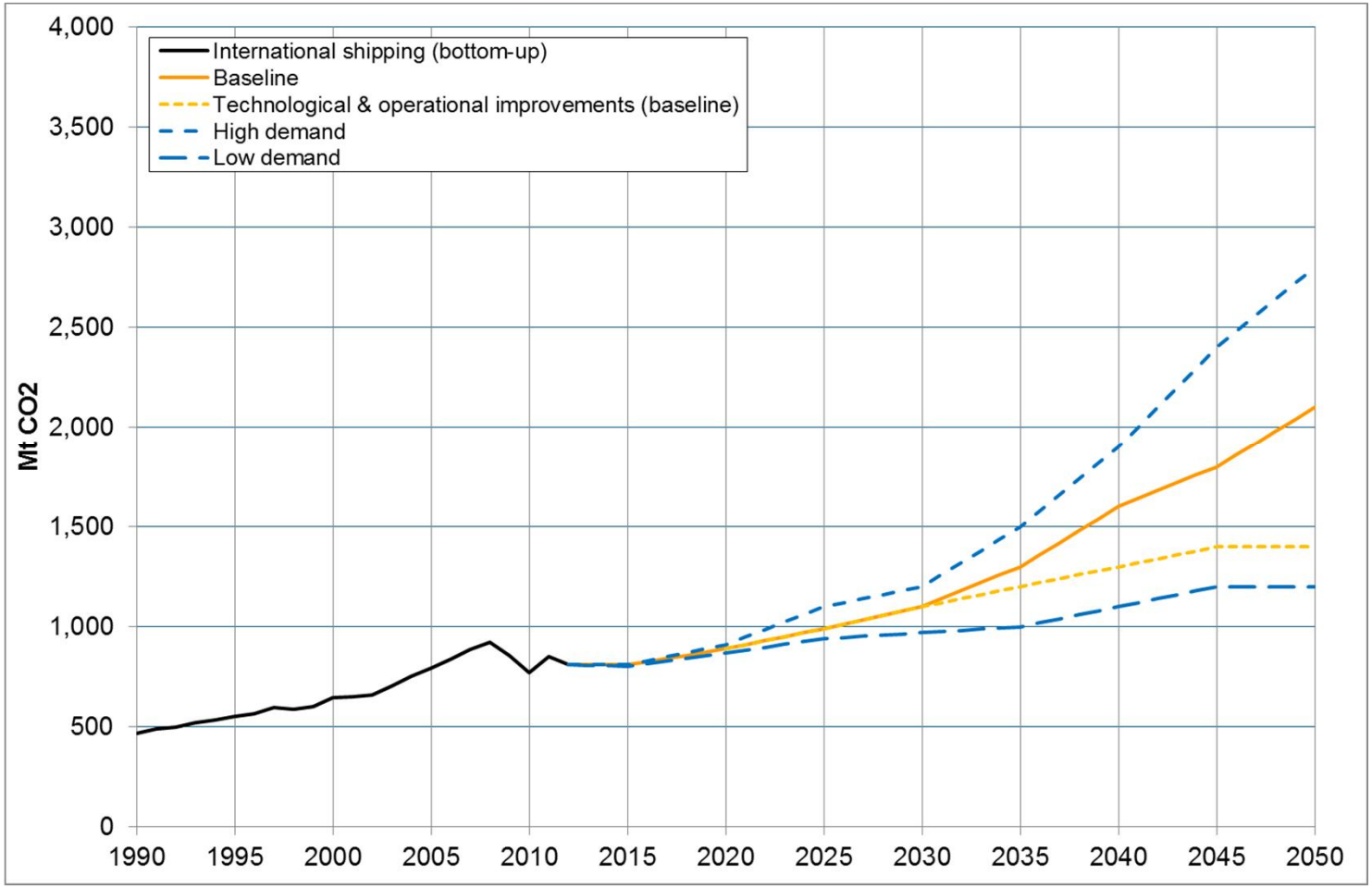



Projected CO_2 emissions from international aviation



Sources: IEA 2014, ICAO 2013b, Lee et al. 2013

IMO projections of CO_2 emissions from international maritime transport



Sources: IEA 2014, IMO 2009, IMO 2014

How to determine GHG targets?

- Normative and political decision
- Cannot be determined scientifically or bottom-up
- What is appropriate or fair?
  - Similar to global emission developments (RCP)
  - Allocate the remaining carbon budget
  - Similar reduction path to comparable entities (countries)
- Which shares
  - 1990
  - 2005
  - 2020

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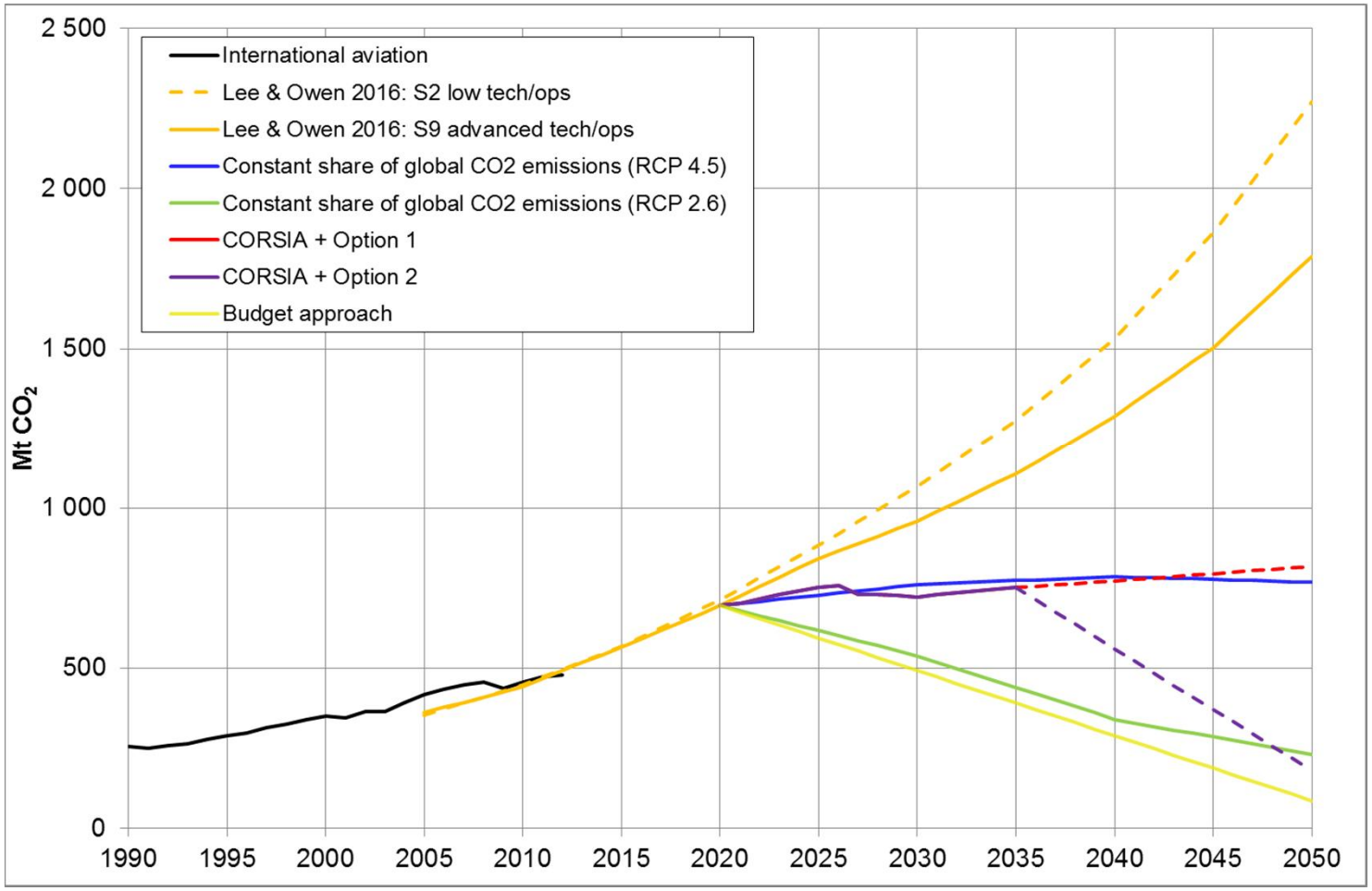
Potential CO_2 emission targets for international aviation



Sources: Authors' own calculations based on IEA 2014, ICAO 2013b, van Vuuren, D. P. et al. 2011, Thomson et al. 2010, IATA 2013, IPCC 2014, ICAO 2010

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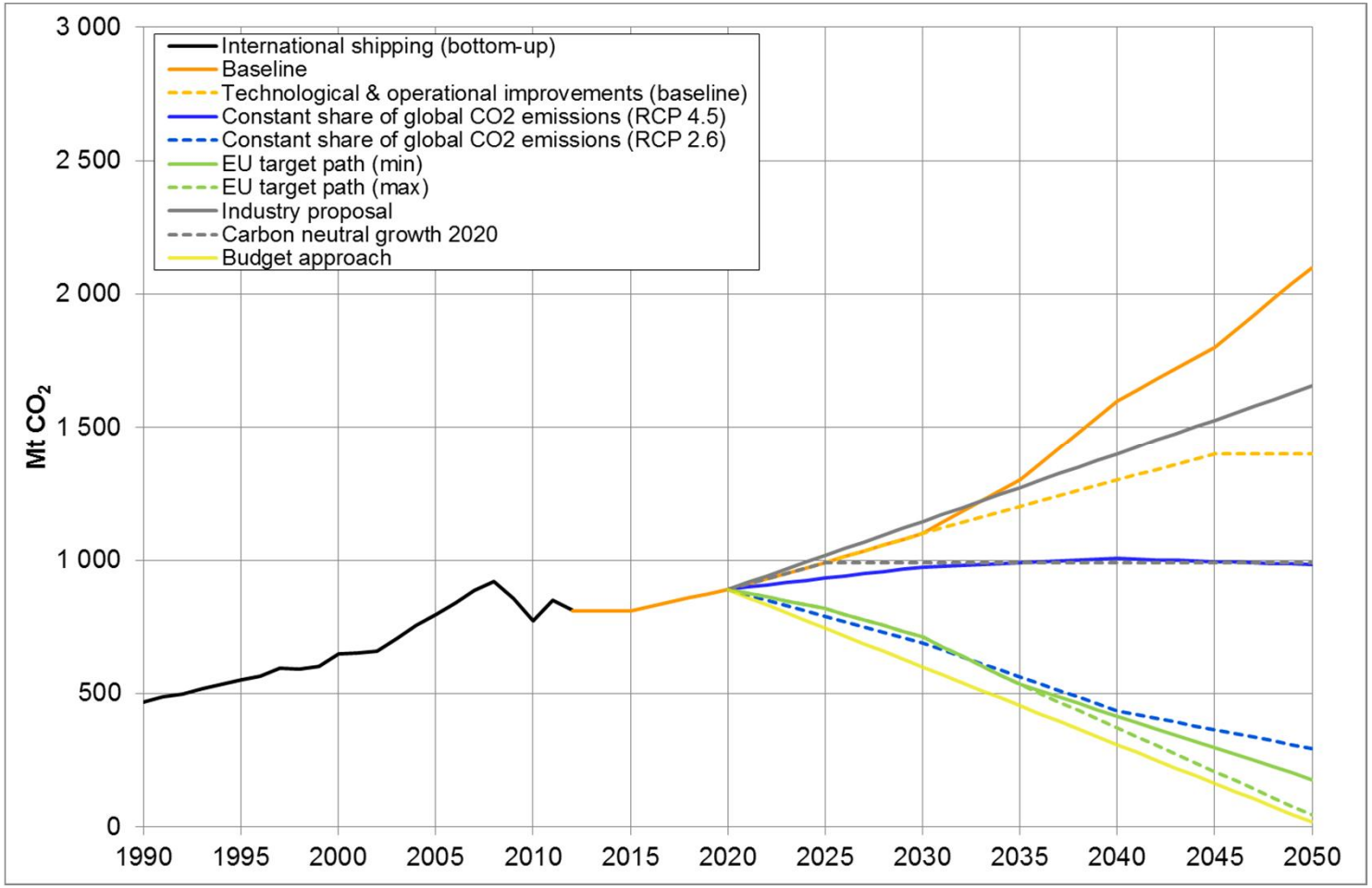
Potential CO_2 emission targets for international maritime transport



Sources: Authors' own calculations based on IEA 2014, IMO 2009, IMO 2014, van Vuuren, D. P. et al. 2011, Thomson et al. 2010, IATA 2013, IPCC 2014, ICS 2015

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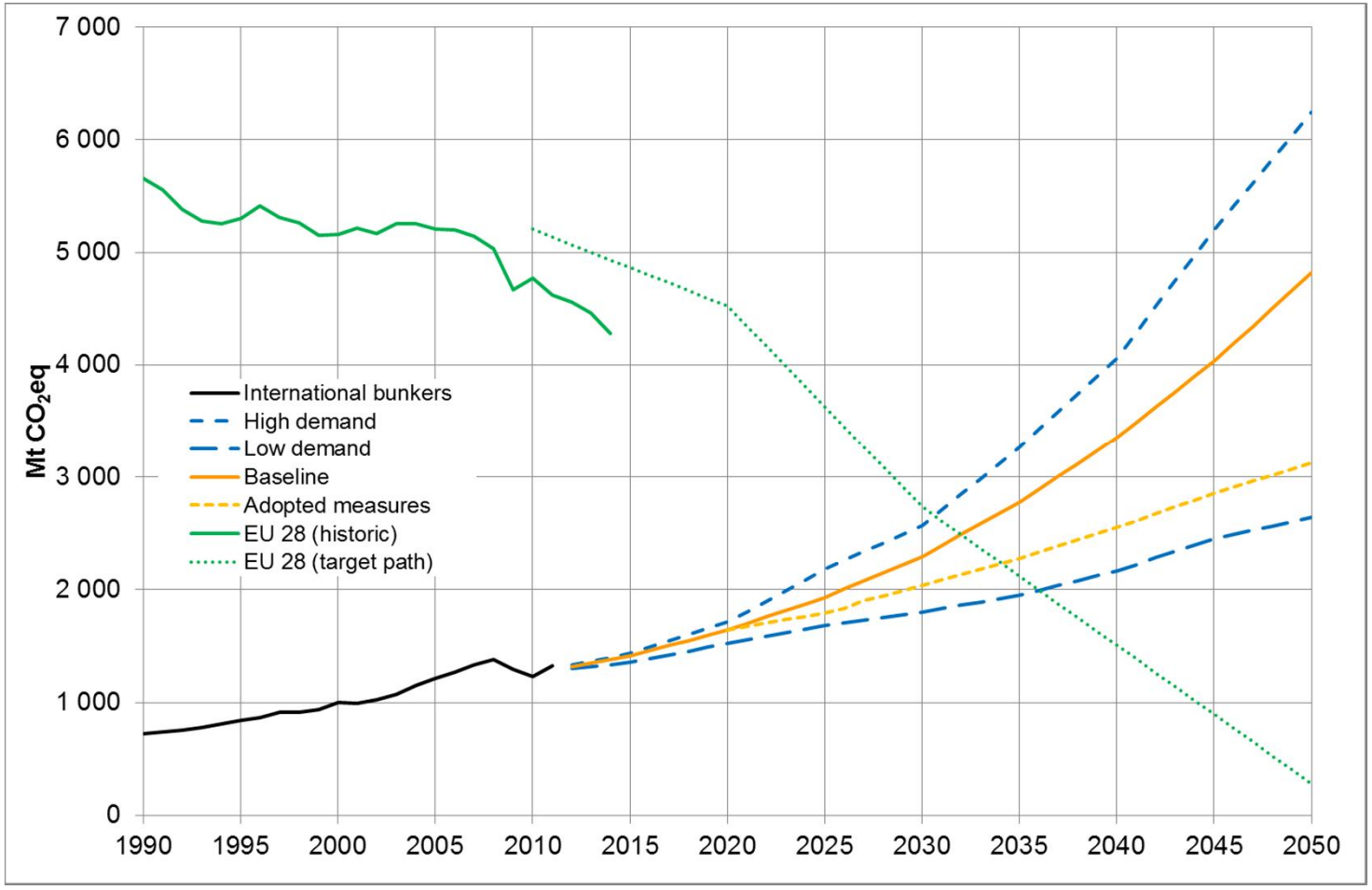
Projected emissions from international bunker fuels and the EU target path



Sources: IEA 2014, ICAO 2013b, IMO 2009, IMO 2014, EEA 2015, Council of the European Union 2011, authors' own calculation

CO_2 emissions targets compared to 2005 emissions

	2020	2030	2040	2050
Aviation				
Lee & Owen 2016: S2 low tech/ops	98%	196%	324%	529%
Lee & Owen 2016: S9 advanced tech/ops	93%	166%	257%	395%
Constant share of global CO2 emissions (RCP 4.5)	93%	111%	118%	113%
CORSIA + Option 1	93%	100%	114%	127%
Constant share of global CO2 emissions (RCP 2.6)	93%	49%	-6%	-36%
CORSIA + Option 2	93%	100%	55%	-50%
Budget approach	93%	37%	-20%	-76%
Shipping				
Baseline	12%	38%	101%	164%
Technological & operational improvements (baseline)	12%	38%	64%	76%
Industry proposal	12%	44%	76%	108%
Carbon neutral growth 2020	12%	25%	25%	25%
Constant share of global CO2 emissions (RCP 4.5)	12%	22%	26%	24%
Constant share of global CO2 emissions (RCP 2.6)	12%	-13%	-45%	-63%
EU target path (min)	12%	-10%	-48%	-78%
EU target path (max)	12%	-10%	-53%	-94%
Budget approach	12%	-25%	-61%	-98%

Sources: Authors' own calculations

Aggregated CO_2 emissions 2021 to 2050 and deviation from 2°C pathway

	Gt CO_2 2021-50	Deviation from RCP 2.6
Aviation		
Lee & Owen 2016: S2 low tech/ops	41,4	213%
Lee & Owen 2016: S9 advanced tech/ops	35,3	167%
Constant share of global CO2 emissions (RCP 4.5)	22,8	73%
CORSIA + Option 1	22,8	73%
CORSIA + Option 2	17,7	34%
Constant share of global CO2 emissions (RCP 2.6)	13,2	0%
Budget approach	11,4	-13%
Shipping		
Baseline	42,0	149%
Technological & operational improvements (baseline)	35,9	113%
Industry proposal	38,6	129%
Carbon neutral growth 2020	29,5	75%
Constant share of global CO2 emissions (RCP 4.5)	29,2	73%
Constant share of global CO2 emissions (RCP 2.6)	16,9	0%
EU target path (min)	16,2	-4%
EU target path (max)	15,1	-10%
Budget approach	13,2	-22%

Conclusions

- Policies adopted are important steps in the right direction
- Efforts reduce GHG emissions so far fall short of the global mitigation requirements
- Targets are no sectoral caps but determine the appropriate contribution to global mitigation efforts
- Achieving these targets requires
  - Technical and operational measures within the sector
  - Offsetting of emissions in other sectors
  - Behavioural change/reduced transport demand
- Mitigation targets indicate that emissions cannot grow unlimited and will provide clear signals for investments
- The case of ICAO illustrates that entity level data it is not necessary to establish a target

Conclusions (continued)

- Even though aviation and shipping are not mentioned in the Paris Agreement they are implicitly included through Art. 4.1 (balance between **anthropogenic** emissions and removals)
- Contribution of both sectors to global GHG mitigation efforts need to be taken into account
  - 2018: Facilitative dialogue (1/CP.21 para 20)
  - 2023, 2028, etc.: Global stocktake (Art. 14.1 PA)
- To stay below 2°C both sectors considerably need to increase ambition
- Delaying action is not an option
  - Requires other sectors to reduce more
  - Requires steeper emission reduction in the future

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Thank you for your attention!

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