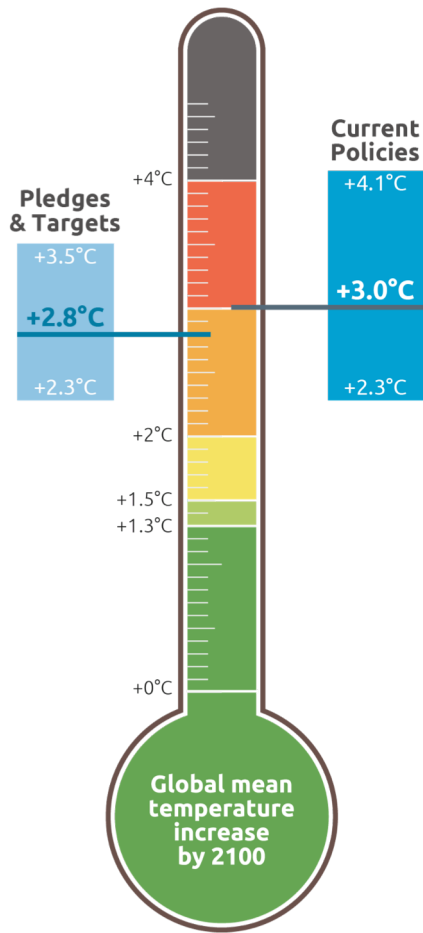




# ClimateActionTracker

## International shipping and aviation emissions



Climate Action Tracker

25 June 2020

[www.climateactiontracker.org](http://www.climateactiontracker.org)

# Agenda

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Introduction to the Climate Action Tracker

Methodology to rate international bunkers

Impact of COVID-19

Assessment of international shipping

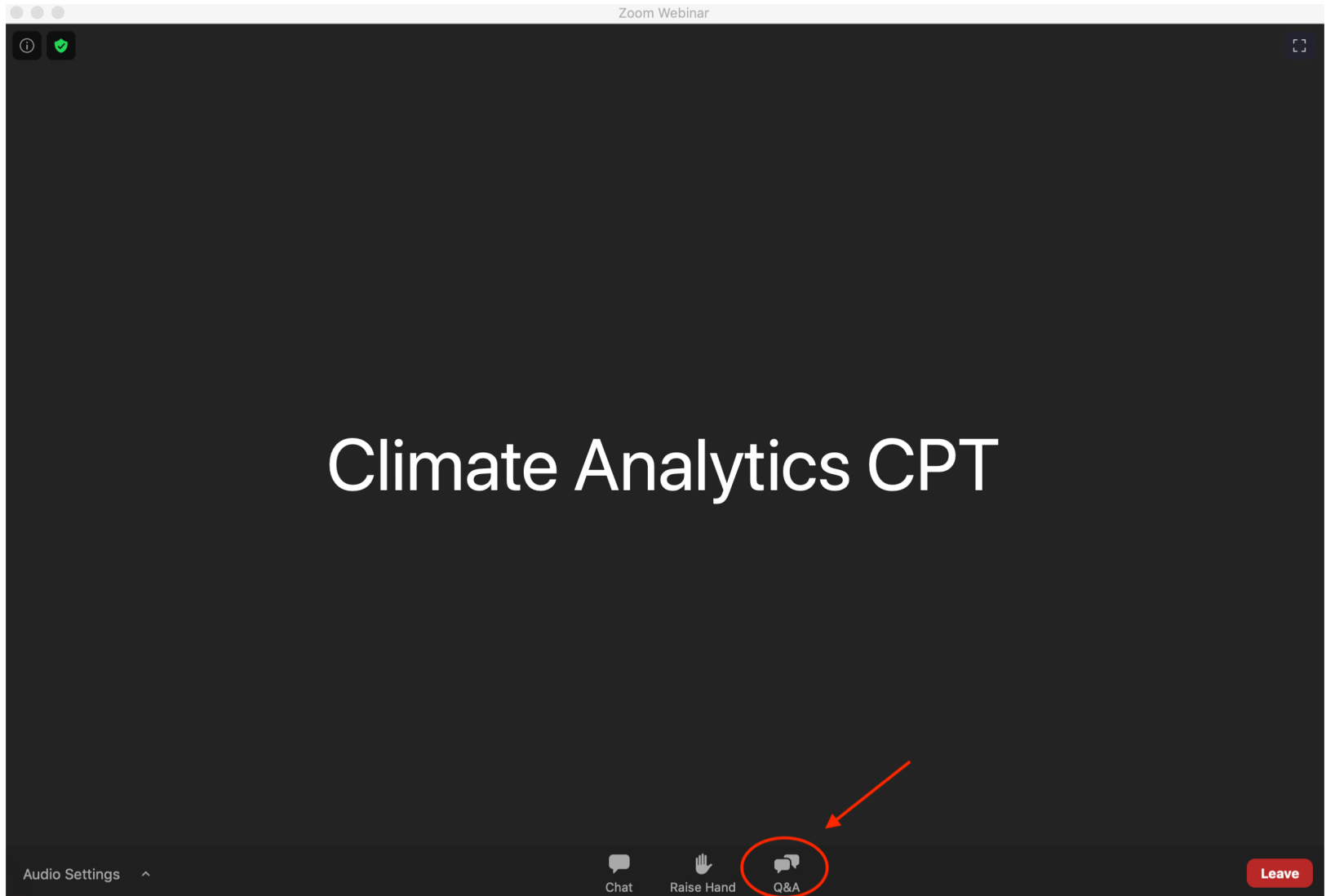
Assessment of international aviation

Zoom Webinar

Climate Analytics CPT

Audio Settings ^

Chat Raise Hand Q&A Leave





ClimateActionTracker

Claire Stockwell (Climate Analytics)

# INTRODUCTION TO THE CLIMATE ACTION TRACKER

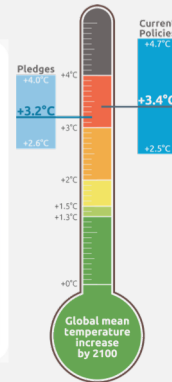
[www.climateactiontracker.org](http://www.climateactiontracker.org)



# CAT tracks actions under the Paris Agreement

I

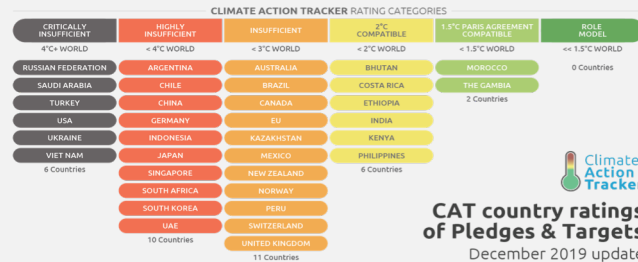
## Global assessment rates *commitments* and *actions* collectively



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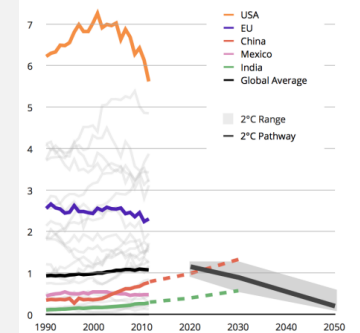
II

## Country assessment rates *commitments* and *actions* individually



III

## Decarbonisation work *tracks* real progress



IV

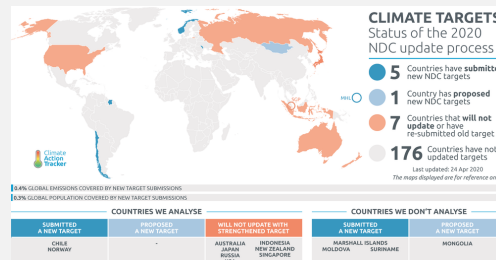
## Governance assessment analyses readiness for climate policy



Climate Governance

V

## Climate Target Update Tracker analyses new commitments

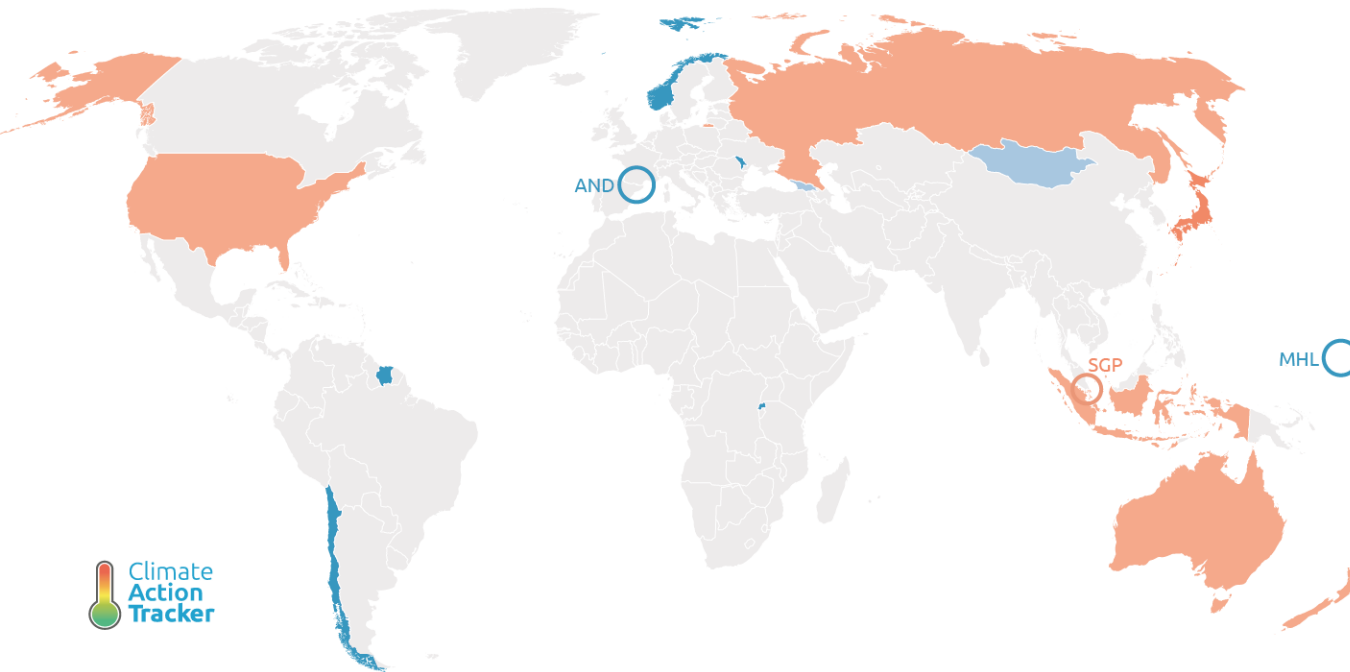


VI

## Scaling up shows opportunities for more action



# Climate Target Update Tracker



## CLIMATE TARGETS

### Status of the 2020 NDC update process

- **7** Countries have **submitted** new NDC targets
- **2** Country has **proposed** new NDC targets
- **7** Countries that **will not update** or have re-submitted old target
- **173** Countries have not updated targets

Last updated: 15 June 2020

*The maps displayed are for reference only*

**0.4%** GLOBAL EMISSIONS COVERED BY NEW TARGET SUBMISSIONS

**0.5%** GLOBAL POPULATION COVERED BY NEW TARGET SUBMISSIONS

#### COUNTRIES WE ANALYSE

SUBMITTED A NEW TARGET	PROPOSED A NEW TARGET	WILL NOT UPDATE WITH STRENGTHENED TARGET	
CHILE NORWAY	-	AUSTRALIA JAPAN RUSSIA USA	INDONESIA NEW ZEALAND SINGAPORE

#### COUNTRIES WE DON'T ANALYSE

SUBMITTED A NEW TARGET	PROPOSED A NEW TARGET
ANDORRA MOLDOVA SURINAME	GEORGIA MONGOLIA
MARSHALL ISL. RWANDA	

# CAT NDC Ratings



## CLIMATE ACTION TRACKER RATING CATEGORIES

CRITICALLY INSUFFICIENT 4°C+ WORLD	HIGHLY INSUFFICIENT < 4°C WORLD	INSUFFICIENT < 3°C WORLD	2°C COMPATIBLE < 2°C WORLD	1.5°C PARIS AGREEMENT COMPATIBLE < 1.5°C WORLD	ROLE MODEL << 1.5°C WORLD
RUSSIAN FEDERATION	ARGENTINA	AUSTRALIA	BHUTAN	MOROCCO	0 Countries
SAUDI ARABIA	CHILE	BRAZIL	COSTA RICA	THE GAMBIA	2 Countries
TURKEY	CHINA	CANADA	ETHIOPIA		
USA	GERMANY	EU	INDIA		
UKRAINE	INDONESIA	KAZAKHSTAN	KENYA		
VIET NAM	JAPAN	MEXICO	PHILIPPINES		
6 Countries	SINGAPORE	NEW ZEALAND	6 Countries		
	SOUTH AFRICA	NORWAY			
	SOUTH KOREA	PERU			
	UAE	SWITZERLAND			
	10 Countries	UNITED KINGDOM			
		11 Countries			



## CAT country ratings of Pledges & Targets

December 2019 update



ClimateActionTracker

Bill Hare

(Climate Analytics)

# RATING INTERNATIONAL BUNKERS

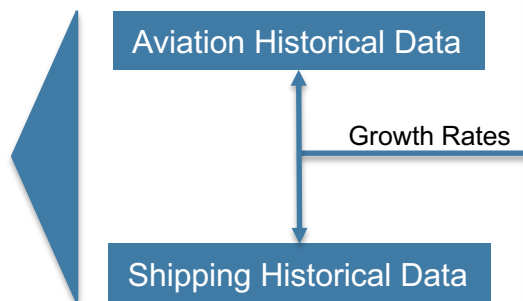
[www.climateactiontracker.org](http://www.climateactiontracker.org)

- Principle: international bunkers should decarbonise **at the same rate as all energy and industrial processes**
- Rate of decarbonisation determined from CAT 1.5C Filtered Pathways
  - Filtered Pathways exclude those that exceed sustainability limits defined in the IPCC SR1.5 Summary for Policy Makers for
    - Bioenergy with Carbon Capture and Storage (BECCS) and
    - Agriculture, Forestry and Other Land Use (AFOLU)
  - Pathways consistent with meeting the Paris Agreement long term temperature goal (LTTG) 1.5°C limit

# Rating Methodology

- International bunkers assumed to decarbonise **at the same rate as all energy and industrial processes**
- Rating is for CO<sub>2</sub> emissions only
  - non-CO<sub>2</sub> emissions and their impact are also important and should be addressed by the sectors
    - Shipping: Black Carbon, SO<sub>x</sub> and NO<sub>x</sub>
    - Aviation: NO<sub>x</sub> emissions and contrail cirrus

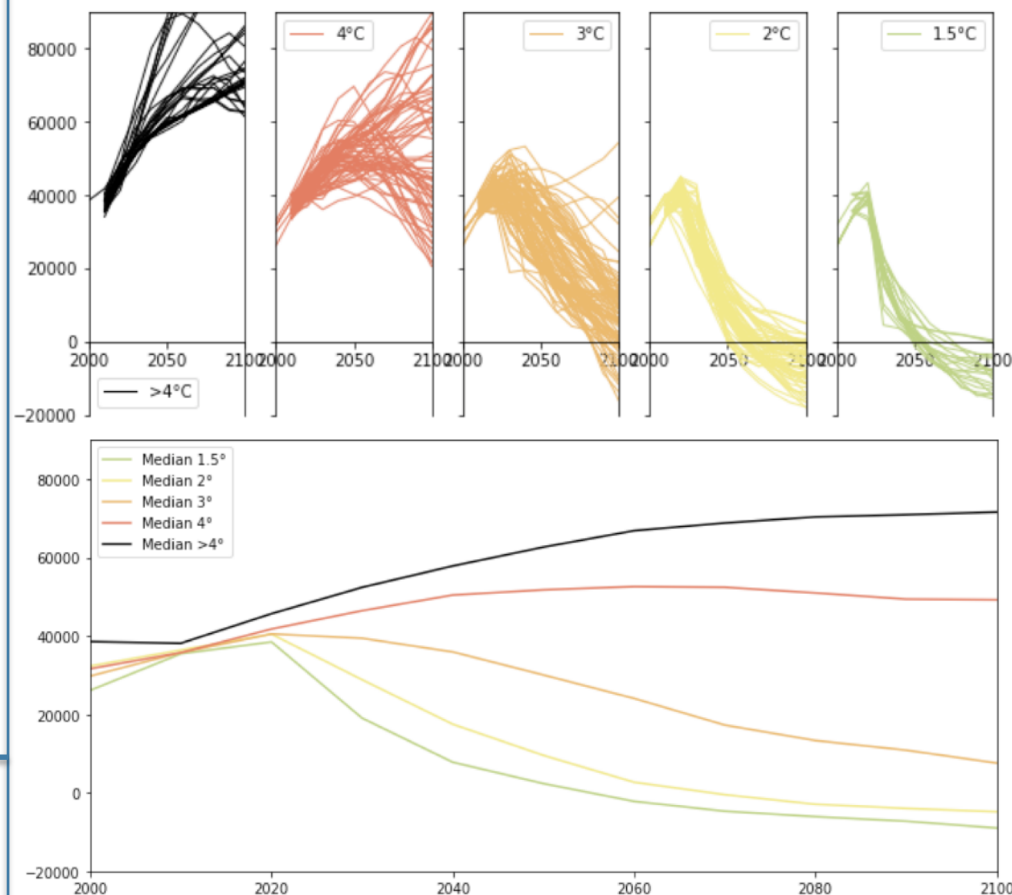
Rating  
Categories



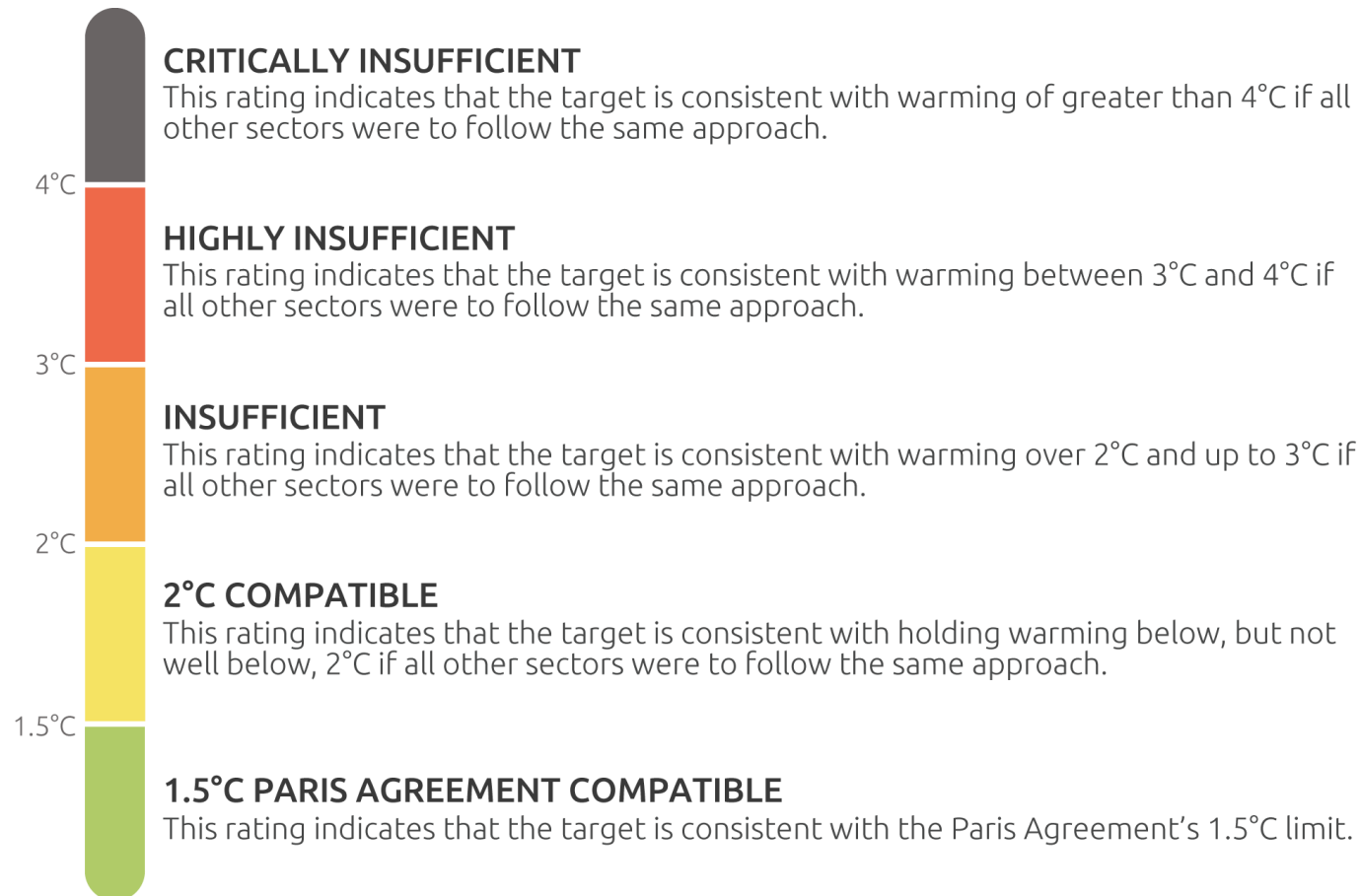
IAM Database

CAT 1.5° Filtered Pathways

## Energy and Industrial Processes CO<sub>2</sub> Pathways



# Five rating categories for sectors



Temperature scale is the same but the methodology for assigning the level of action to each temperature band is necessarily different from that used for the CAT 'fair share' rating for a country's Paris Agreement NDC (Nationally Determined Contribution)



# ClimateActionTracker

Prof. Niklas Höhne  
(New Climate Institute)

## COVID-19 RESPONSE

[www.climateactiontracker.org](http://www.climateactiontracker.org)



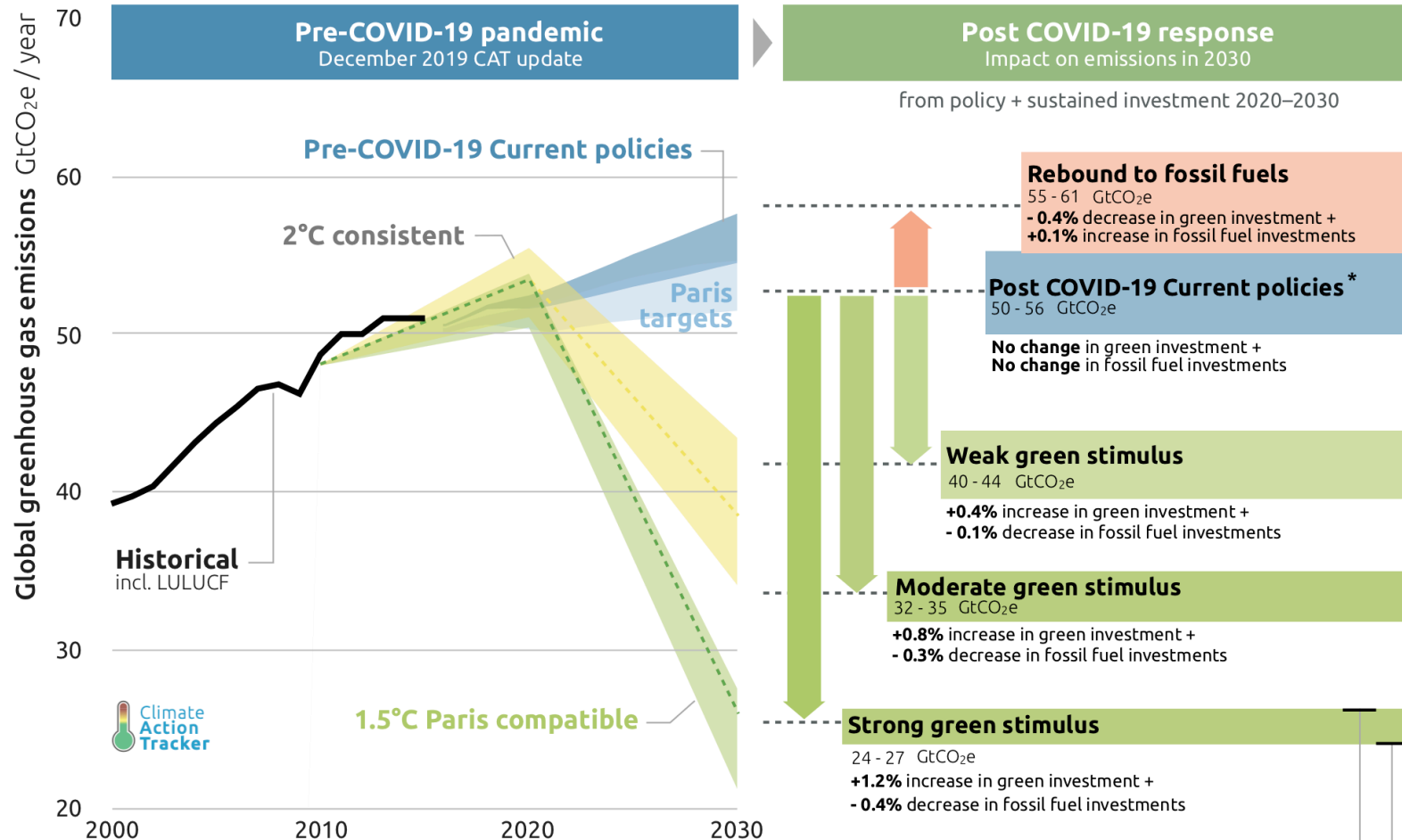


# COVID-19 offers an opportunity for green stimulus



## Green stimulus to fight the COVID-19 economic crisis and the climate crisis

Strong climate policies plus sustained investment can provide valuable jobs, revitalise economies and get the world on track to meeting the 1.5°C Paris Agreement goal



\* Indicative results for post COVID-19 current policies has been calculated on a different basis compared to normal pre-COVID-19 method and excludes any announcement of economic recovery measures to date.

### Explaining the ranges on estimates

Based on the **optimistic scenario** of future GDP growth

Based on the **pessimistic scenario** of future GDP growth



# Impact of COVID-19 on international bunker emissions



- Emissions in 2020 will be substantially lower than in 2019
- For both sectors, we developed two scenarios to evaluate emissions in 2030:
  - **Low emissions:** large decrease in 2020 emissions, slower recovery and high technology improvements
  - **High emissions:** smaller decrease in 2020 emissions, faster recovery and low technology improvements
- COVID-19 may have no substantial impact on long-term emissions from international bunkers



ClimateActionTracker

Marie-Camille Attard (Climate Analytics)

# INTERNATIONAL SHIPPING

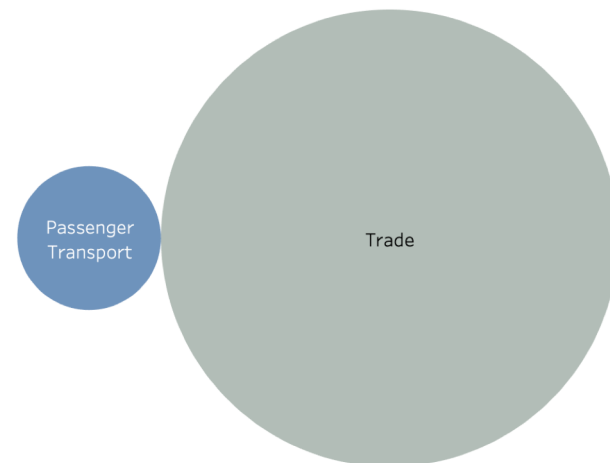
[www.climateactiontracker.org](http://www.climateactiontracker.org)



# International Shipping profile

## Emissions

- Emissions are due to trade transport (close to 90%) and passenger transport (cruises and Ro-Pax Ferries)
- The CAT projects emissions will grow from 50% to double by 2050 from 2019 levels.
- Due to COVID-19, emissions in 2020 may be 18-35% lower than in 2019



2015 international shipping CO<sub>2</sub> emissions.  
Trade : 91%; Passenger Transport : 9%.  
Source: ICCT, 2017

## Governance

- Countries work through the International Maritime Organisation (IMO) to address international shipping emissions

### IMO Initial Strategy to reduce GHG emissions (2018)

IMO	Targets	
CARBON INTENSITY	2030 target	At least 40% below 2008 average CO <sub>2</sub> emissions per transport work
	Coverage	CO <sub>2</sub> only
	2050 target	70% below 2008 average CO <sub>2</sub> emissions per transport work
	Coverage	CO <sub>2</sub> only
ABSOLUTE REDUCTION	2050 target	At least 50% below 2008 levels
	Coverage	All GHGs as defined by the Kyoto Protocol



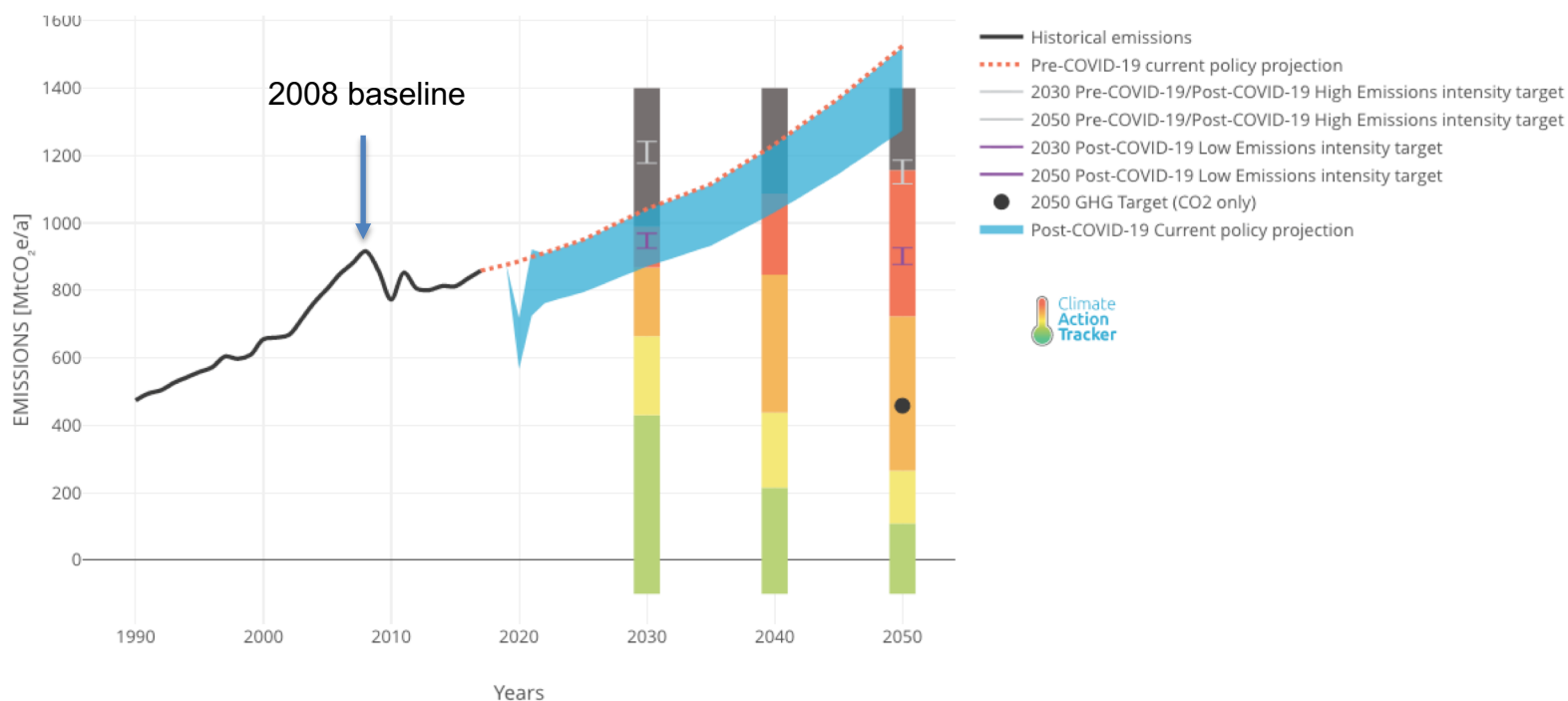
# Targets: ambition needs to be increased

## 2030 carbon intensity target – critically insufficient

- Close to 30% already achieved in 2018
- Rated critically to highly insufficient depending on COVID-19 impact on trade
- Needs to shift to absolute emissions reduction

## 2050 absolute target – Insufficient

- Current policies projected to be far off the target nor are engaged in a reducing trajectory





# Measures to reduce emissions needs to accelerate



- **Few policy instruments** implemented
- The IMO initial strategy adopted in 2018 **set to be reviewed in 2023**



## Operational and technological measures

- **Main measure implemented so far:** EEDI (Energy Efficiency Design Indexes):
  - Ships energy efficiency to be improved by 30% in 4 phases compared to average efficiency for ships built between 2000 and 2010
  - Draft amendments to accelerate the entry into force the phase 3 on some ships in 2022 vs. 2025 and to increase the target up to 50% - **agreed for adoption but delayed due to COVID-19, cancellation of MEPC 75<sup>th</sup> session**
- Limiting speed of ships :
  - Most efficient operational measure
  - **No concrete measures adopted so far** – preferred option a „goal based approach“ (last 6th Intersessional WG on Reduction of GHG emissions from ships in November 2019)



# Measures to reduce emissions need to accelerate

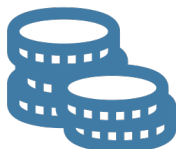


## Alternative fuels

- Need to shift away from HFO: immediate impact emissions
- **Ban of Heavy Fuel Oil (HFO)** in the Arctic set in 2023 **likely to be 5 years later for Arctic nations**
- LNG is not an option:
  - Does not allow a full decarbonization
  - Investments growing > risk of stranded assets
  - Risk of Carbon “lock-in” effect
- Alternative low-carbon & zero-carbon fuel “implementation program”
  - Measures aimed to be “agreed” between 2023-2030 and development 2030+
  - Failed to assess potential measures proposed by member states in April 2020 MEPC session

Alternative fuels	
Battery storage Vessels	Short distance cruising and RoPax Fully battery powered vessel aimed by 2030
Biofuels	Swedish Stena Bulk - test - run one tanker 100% biofuel – March 2020
Ammonia ICE/fuel cell	First Ammonia fuel cell system vessel expected in 2024
Hydrogen ICE/fuel cell	Vessel to be retrofitted by 2023 will combine a 3.2MW hydrogen fuel cell with battery storage

Sources : [gcaptain.com](https://gcaptain.com), [rechargenews.com](https://rechargenews.com), [afloat.ie](https://afloat.ie), [stenalbulk.com](https://stenalbulk.com)



## Market driven

- **Market Based Instruments:** EC proposal expected in 2021 on the inclusion of international shipping emissions in the EU ETS system.
- **Demand:** major driver of shipping emissions
  - Decarbonizing the economies will be driver to reduce trade of fossil fuels
  - Development of more sustainable supply chains will be key in reducing trade of merchandise



# International Shipping: next steps needed

## Increase ambition:

- Increase ambition and scope of targets (from intensity target to absolute target)
- Baseline chosen at the height of historical emissions

## Action needs to accelerate:

- Measures with a “quick turn around” on emissions:
  - Reduction of ship speeds
  - Shift away from heavy fuel oil reduces black carbon emissions
- **Foster the development and use of low-carbon fuels by shipping companies:**
  - **LNG is not an option** – risk of stranded assets and carbon “lock-in” effect
  - Consider carbon tax on heavy fuel?
  - Enforce a gradual use of low-carbon fuel ?





ClimateActionTracker

Silke Mooldijk (NewClimate Institute)

# INTERNATIONAL AVIATION

[www.climateactiontracker.org](http://www.climateactiontracker.org)



# Short background on international aviation emissions



- International aviation: 1.2% of global GHG emissions
- The CAT projects that emissions from international aviation will **double to triple** between 2015 and 2050.
- Due to COVID-19, emissions in 2020 may be **45-60% lower** than in 2019
- The aviation industry expects to be back at 2019 levels by 2023



Countries work through the **International Civil Aviation Organization (ICAO)** to address emissions



ICAO Assembly:  
Aspirational goal of  
**carbon neutral  
growth from 2020**

Main measure to achieve the target:





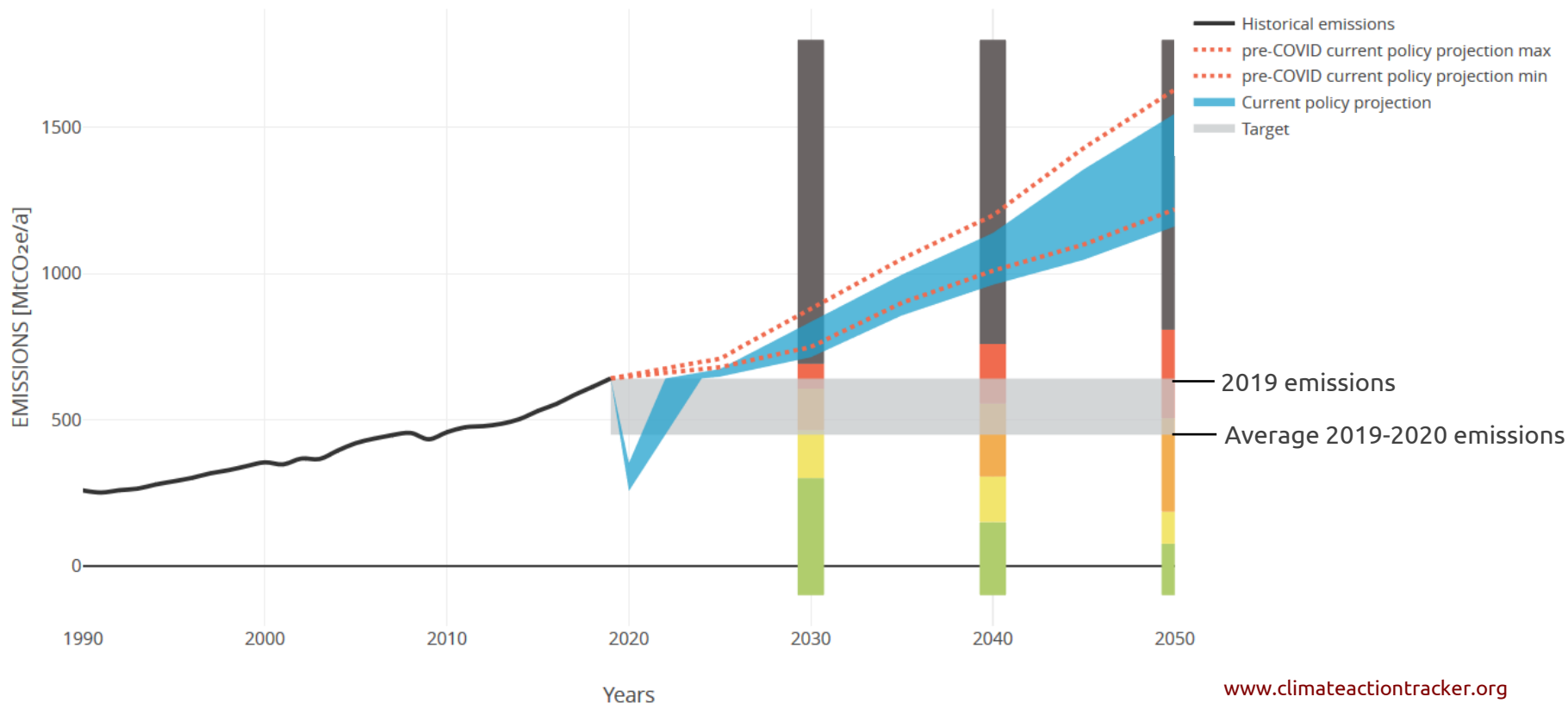
# International aviation's target of carbon neutral growth and its current policy projections are 'critically insufficient'



## Carbon neutral growth – critically insufficient

- Target range alone in 2030: 'highly insufficient' or '2C compatible'
- Downgraded to 'critically insufficient':
  - Target includes CO<sub>2</sub> emissions only
  - CORSIA not set to achieve the target

## No absolute target for 2050





# Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) has major shortcomings



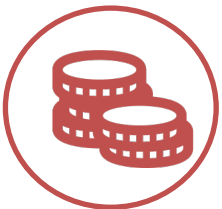
## Participation is limited

- CORSIA may cover **less than 50% of emissions** between 2021-2035



## Emission offset units likely to deliver insufficient reductions due to heterogenous quality

- The ICAO Council approved Emission Unit Criteria (EUC), but the EUC are not consistently applied



## Expected emission unit prices are unlikely to trigger investments in operational and technical measures

- Cheaper to purchase offset credits than to invest in technical and operational measures



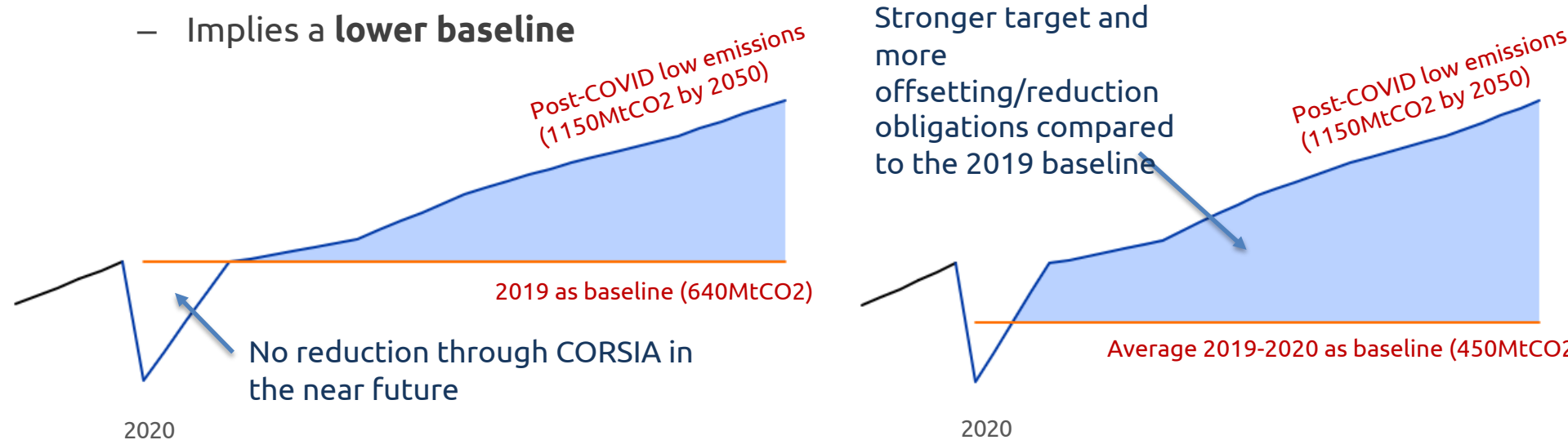
## CORSIA eligible fuels may not deliver sufficient reductions

- Eligible lower carbon fuels may result in limited emission reductions
- Claimed reduction may be higher than the actual reduction



# Baseline for CORSIA and carbon neutral growth

- Current rules for CORSIA's baseline: **average 2019-2020 emissions**
- Due to **COVID-19**, emissions will be substantially lower in 2020 than anticipated
  - Implies a **lower baseline**



Example: 60% decrease in 2020 emissions and low future emissions scenario

- The aviation industry has asked ICAO to **revise the rules** and take 2019 emissions as the baseline
- Adjusting CORSIA's baseline would **remove most offsetting obligations and incentives to reduce emissions in the near future**



# International aviation has a huge mitigation potential and decarbonisation by mid-century is possible

To some extent, governments and industry focus on:

- **Demand management** (modal shift, levies & taxes)
- **Operational measures** (improved air traffic management, optimised routing)
- **Energy efficiency measures** (improved aircraft design)

More efforts are needed to steer the sector towards Paris compatibility

A strong focus on decarbonisation technologies required:

- **Synthetic power-to-liquid fuels**
  - Continue to use current infrastructure and engines
  - Currently very expensive
- **Electric batteries**
  - Short-haul flights
- Governments: financial support to lower financial risks and support R&D, fuel standards, carbon pricing
- Mitigation potential: 100% compared to current practice



Source: [https://commons.wikimedia.org/wiki/File:X57-Maxwell-CGI\\_\(cropped\).jpg](https://commons.wikimedia.org/wiki/File:X57-Maxwell-CGI_(cropped).jpg)



- 2030 target rated “critically insufficient”
- Target of halving emissions by 2050 “insufficient” and not supported by policies, emissions to rise sharply despite the impact of COVID-19
- Potential exists to decarbonise completely and reach zero emissions by 2050
- Liquefied natural gas (LNG) is not an option that would support a transition to zero CO<sub>2</sub> emissions



- Carbon neutral growth from 2020 rated “critically insufficient”
- Emissions to rise sharply despite the impact of COVID-19
- CORSIA unlikely to be sufficient to reach target (likely covers <50% of international aviation emissions between 2021-2035 and is likely to allow compensation without real emission reductions elsewhere)
- Change of baseline year to 2019 would eliminate the requirement for reductions through CORSIA in the coming years



# ClimateActionTracker

Q&A





# ClimateActionTracker

## EXTRA SLIDES

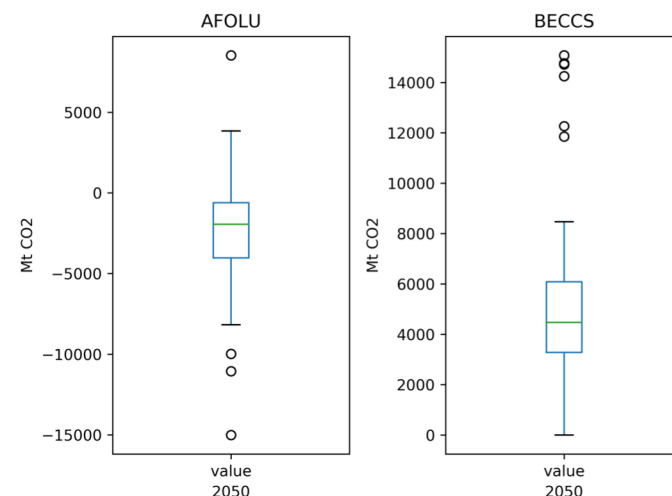
- **Why?**

- The IPCC Special Report on 1.5°C **does not** assess the Paris Compatibility of mitigation pathways
- It does, however, provide some guidance on sustainability criteria that **can be** used to further select scenarios

- **How?**

- Three criteria, drawn from **Fuss et al. (2018)**
  1. Scenarios are either 'low-' or 'no-overshoot' pathways
  2. Emissions sequestered by **BECCS** < **5 GtCO<sub>2</sub>** in 2050
  3. Net removal by **AFOLU** < **3.6 GtCO<sub>2</sub>** in 2050







We apply the sustainability filters to the **average of the emission values** of 2040, 2050 and 2060, and are left with **19 'Paris Agreement' compatible pathways**



# Greening the Economic Recovery

## THE DO'S AND DON'TS OF GREEN ECONOMIC RECOVERY

Green stimulus interventions and harmful actions to avoid

 <b>Energy and electricity supply</b>		 <b>Land-based transport and mobility</b>		 <b>Industry</b>	
✓	✗	✓	✗	✓	✗
<ul style="list-style-type: none"> <li>▶ Direct support for zero-emissions technologies and infrastructure</li> <li>▶ Fiscal reform on fossil fuel subsidies</li> </ul>	<ul style="list-style-type: none"> <li>▶ Revive plans for 'shovel-ready' fossil fuel power plants</li> <li>▶ Waive oil and gas industry environmental regulations</li> <li>▶ Bail out fossil fuel companies without conditions for zero-emission transition</li> </ul>	<ul style="list-style-type: none"> <li>▶ Financial incentives for zero-emission vehicles</li> <li>▶ Direct investments in low-carbon public transport</li> </ul>	<ul style="list-style-type: none"> <li>▶ Roll back emission standards for cars</li> <li>▶ Support to automobile companies without conditions for zero-emissions transition</li> </ul>	<ul style="list-style-type: none"> <li>▶ Support uptake of efficient appliances, lighting, and digital devices</li> <li>▶ Low-carbon technology R&amp;D and pilot projects (e.g. steel and cement)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Roll back climate measures and regulation (e.g. industry levy for supporting renewable energy)</li> <li>▶ Support for industry without conditions for zero-emission transition</li> </ul>
 <b>Aviation</b>		 <b>Buildings</b>		 <b>Land-use and environmental protection</b>	
✓	✗	✓	✗	✓	✗
<ul style="list-style-type: none"> <li>▶ Conditional sector support for aviation industry (e.g. bailout) and accelerated R&amp;D efforts</li> </ul>	<ul style="list-style-type: none"> <li>▶ Roll back regulations and taxes (e.g. ticket taxes)</li> <li>▶ Recalibrate CORSIA baseline without substantially improving entire scheme</li> </ul>	<ul style="list-style-type: none"> <li>▶ Support for energy efficient retrofits of existing buildings</li> <li>▶ Support for accelerated construction of low and zero-energy buildings</li> </ul>	<ul style="list-style-type: none"> <li>▶ Stimulus programmes for new buildings without energy efficiency criteria</li> </ul>	<ul style="list-style-type: none"> <li>▶ Large-scale landscape restoration and reforestation efforts</li> </ul>	<ul style="list-style-type: none"> <li>▶ Roll back environmental regulations</li> <li>▶ Dismantling enforcement of state protection for natural habitats</li> </ul>



# Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) has major shortcomings (1/2)



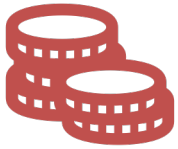
## Participation is limited

- Many countries exempt based on socio-economic and activity criteria;
- China, Brazil, India and Russia expressed reservations with critical features of CORSIA. They will not participate in the pilot phase (2021-2023) and may not participate in later phases
- CORSIA may cover **less than 50% of emissions** between 2021-2035



## Emission offset units likely to deliver insufficient reductions due to heterogenous quality

- The ICAO Council approved Emission Unit Criteria (EUC), but the EUC are not consistently applied
- Chief concern: many of the programmes supplying CORSIA credits cannot guarantee additionality and avoidance of double claiming



### Expected emission unit prices are unlikely to trigger investments in operational and technical measures

- Supply likely exceeds demand
- Average price for carbon offset credits on the voluntary market: €3
- Cheaper to purchase offset credits than to invest in technical and operational measures



### CORSIA eligible fuels may not deliver sufficient reductions

- Two criteria for CORSIA eligible fuels:
  - At least **10% emission reduction** compared to standard jet fuel
  - Not made from **biomass sources from land with a high carbon stock**
- 10% emission reduction may help achieve CNG2020, but unlikely to lead to decarbonisation of international aviation
- Significant optimism bias in ILUC values used to determine carbon emissions from biofuels, so claimed reduction may be higher than the actual reduction

# Mitigation options: where do we stand?

Decarbonization of the grid will be key in driving the development of low carbon fuels

	Allow use existing engines?	Volume / weight	Energy efficiency	Min. grid Carbon intensity (g/kwh)	
Battery storage Vessels	No	High/high	High	550	Suitable for short distance cruising and Ropax
Biofuels	Yes	Low/ Medium	Low	-	Biofuels production costs needs to be reduced
LNG	Yes	Low/Low	Low	-	Cannot deliver a full decarbonization
Ammonia ICE/fuel cell	Yes/No	Low/ Medium	Low	200	Expected to play a major role on the long term
Hydrogen ICE/fuel cell	Yes/No	Medium/ Medium	Low	150-175	

Source: Energy Transition Commission, 2019



First Ammonia fuel cell system vessel expected in 2024. Source:gcaptain 2020.



Fully battery powered vessel aimed by 2030. Source: Afloat 2020.

# CAT Framework for Evaluating Progress on Climate Action



## Pledges & Targets

## Current Policies

