Supporting European Aviation

EUROCONTROL

NM Safety Forum 2022

Agility in response to future threats: Climate Change

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30th June 2022

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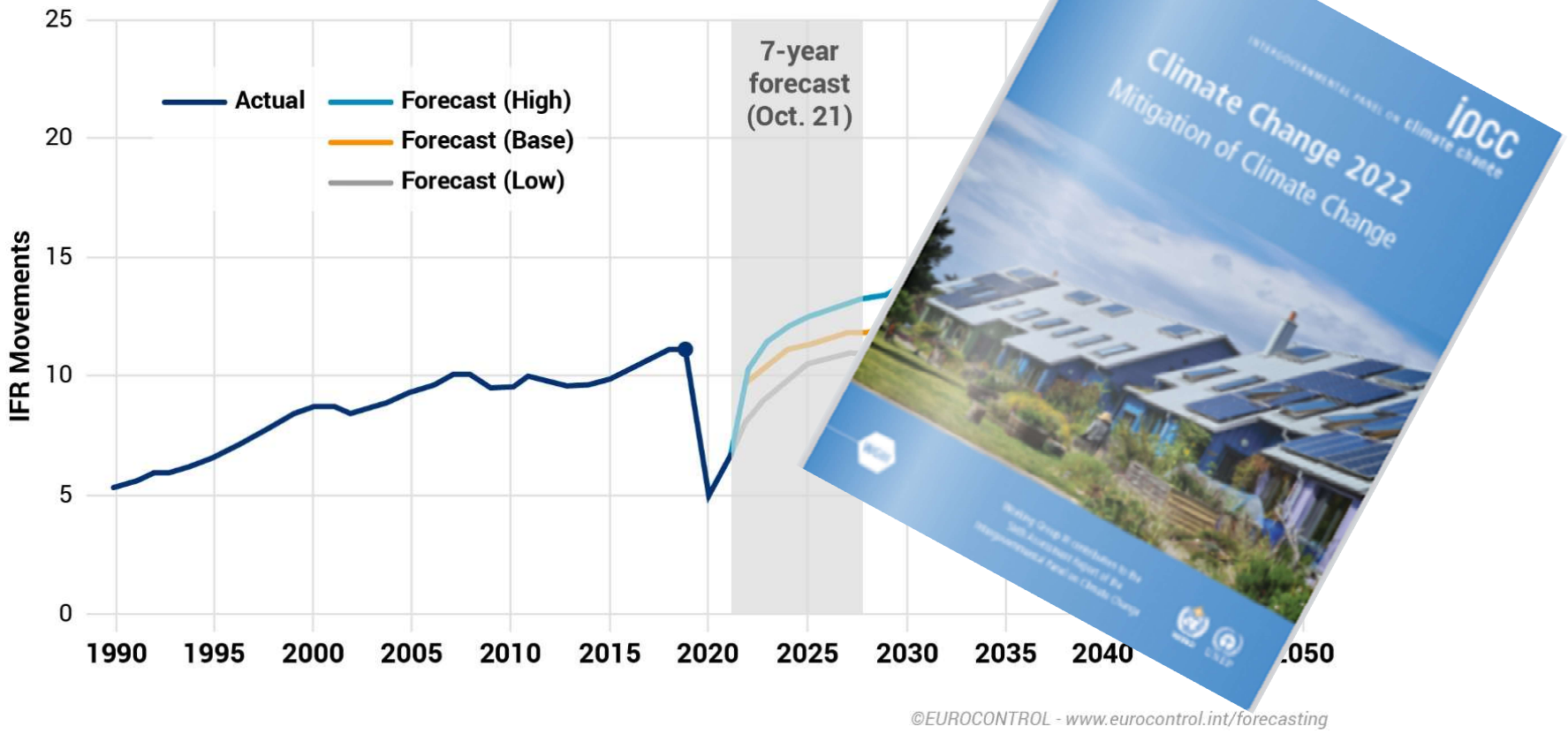
Growth in traffic will return



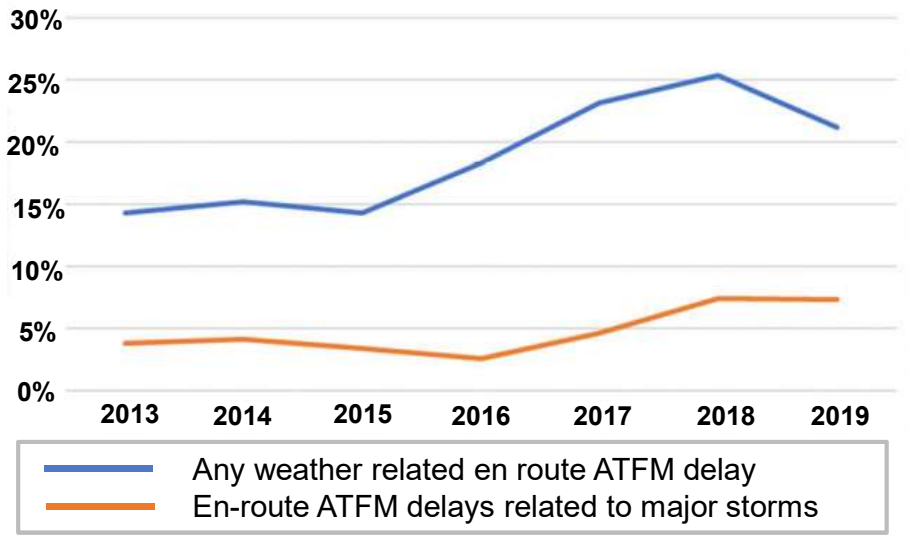
Climate Change impacts are wide-ranging

Low visibility caused by sandstorm disrupts flight operations. (Pic: Dubai Airport twitter)

2013-2019: Storm frequency increasing with clear effect on en-route ATFM delay

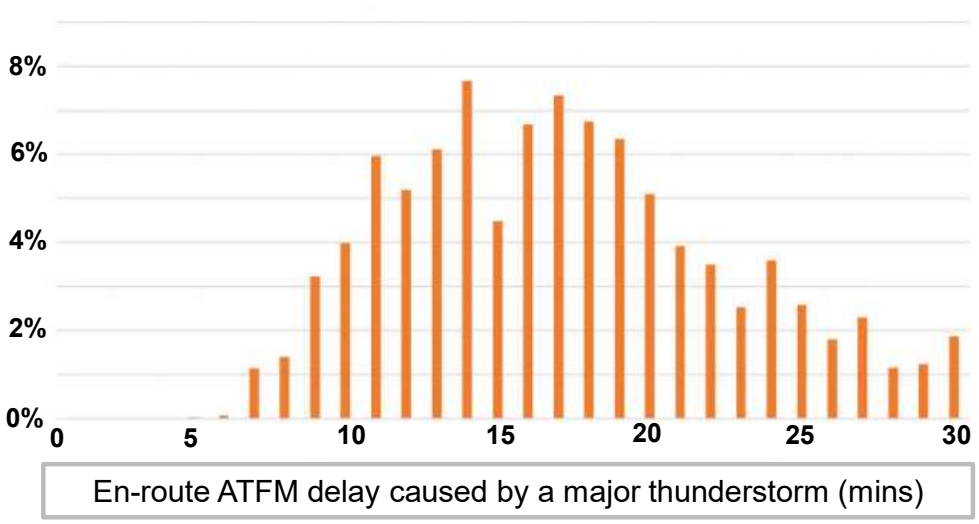
% of total en-route ATFM delay per year

EUROCONTROL area



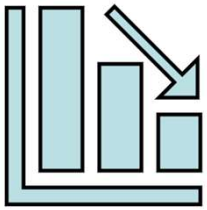
% of flights delayed by a major thunderstorm

EUROCONTROL area (2013-2019)



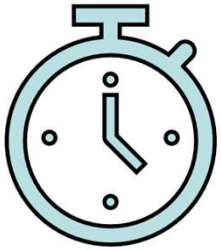
- On average, **storms are responsible for up to 7.5% of total en-route ATFM delays** at network level, and the **trend is increasing** (2013-2109)
- If a flight is affected by a storm, then the average en-route ATFM delay due to that storm can be expected to be at around **17-18 minutes per delayed flight** (2013-2019)

Frequency of major storms forecast to drop by 2050, *but* intensity of storms that do affect flights will lead to more significant delay



-8% to -12%

Forecast drop in share of all flights likely to be delayed by a major storm (*if there was no change in the aviation system in 2050)*



20 to 22 minutes

Forecast average en-route ATFM delay due to weather per flight delayed by a major storm in 2050

Impacts of Storms

- Disruption to **operations**:
  - delays, re-routings, route extensions, trajectory management, HFE, increased fuel burn and emissions
  - Potential en-route capacity loss and congestion
- Larger / more intense convective systems could affect multiple hub airports
- Damage to infrastructure
- Increase in lightning strikes

AEROSPACE & DEFENSE MAY 27, 2018 / 1:54 PM / 2 DAYS AGO

London's Stansted has flights disrupted by lightning strike

2 MIN READ

Reuters Staff

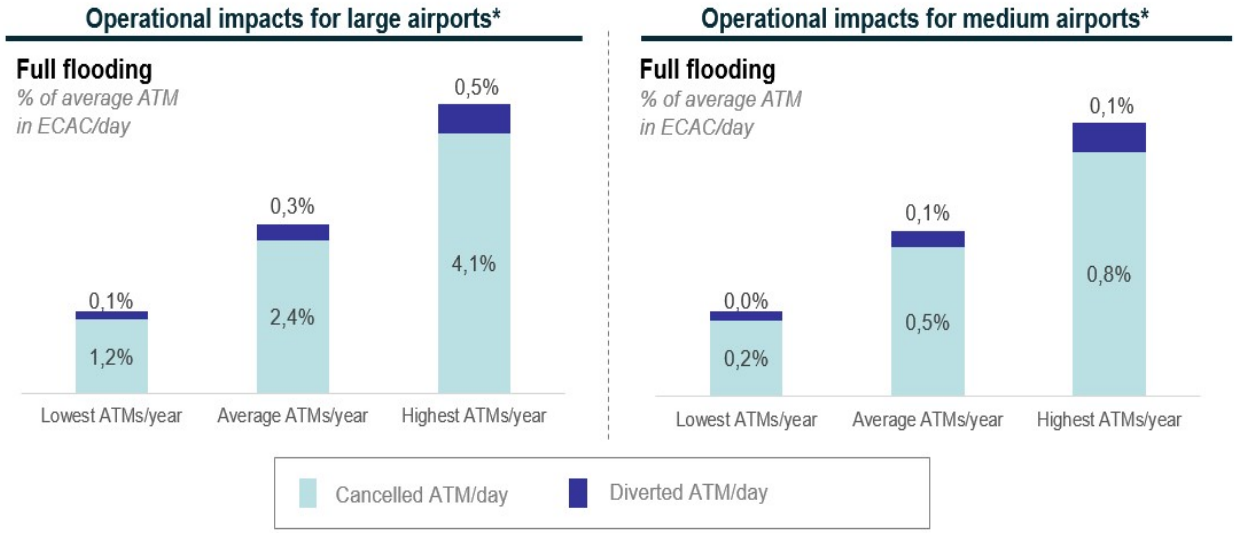
LONDON (Reuters) - London's Stansted airport delayed, diverted and cancelled some flights after a lightning strike on an aircraft fuelling system during storms that unleashed more than 64,000

Temperature change

- Disruption to **operations**:
  - Changes to aircraft performance: take-off, payload, runway length, landing speed
    - Example: Phoenix 2017: too hot for some regional jets to take-off (certification)
- Heat damage to airport surface (e.g. runway, taxiway)

Sea-level rise & storm surge

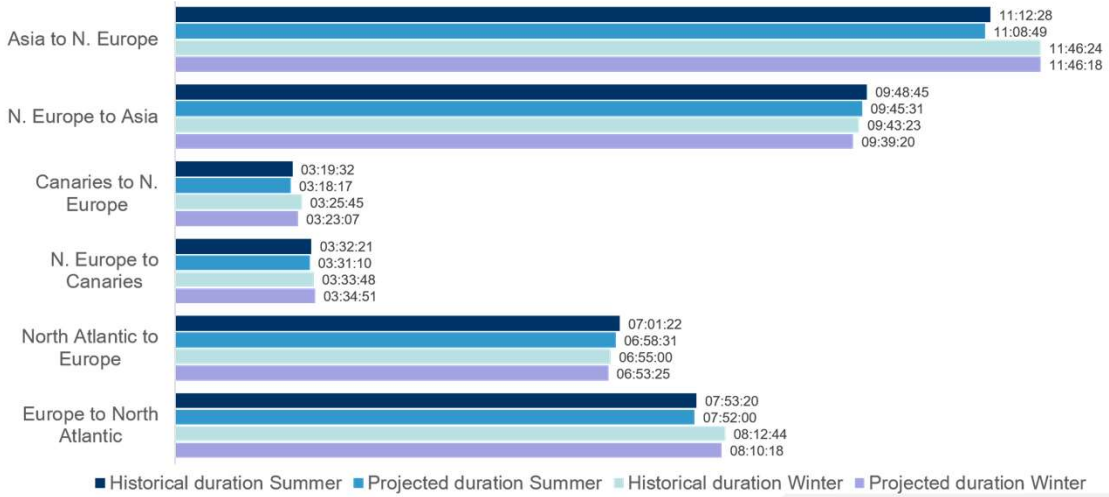
- Disruption to **operations**:
  - Permanent / temporary loss of airport capacity /infrastructure
    - Delay and disruption from runway inundation
    - Network disruption



Wind

- Disruption to **operations**:
  - Changes to trans-Atlantic flight times and routings: airport slot management
  - Increase in crosswinds due to shifts in prevailing wind direction
  - Changes in procedure due to crosswinds - environmental impact?
  - Reduction in capacity at airports with no crosswind runway
  - Disruption to operations if winds are too strong to take-off or land for spec aircraft type
- More clear air turbulence

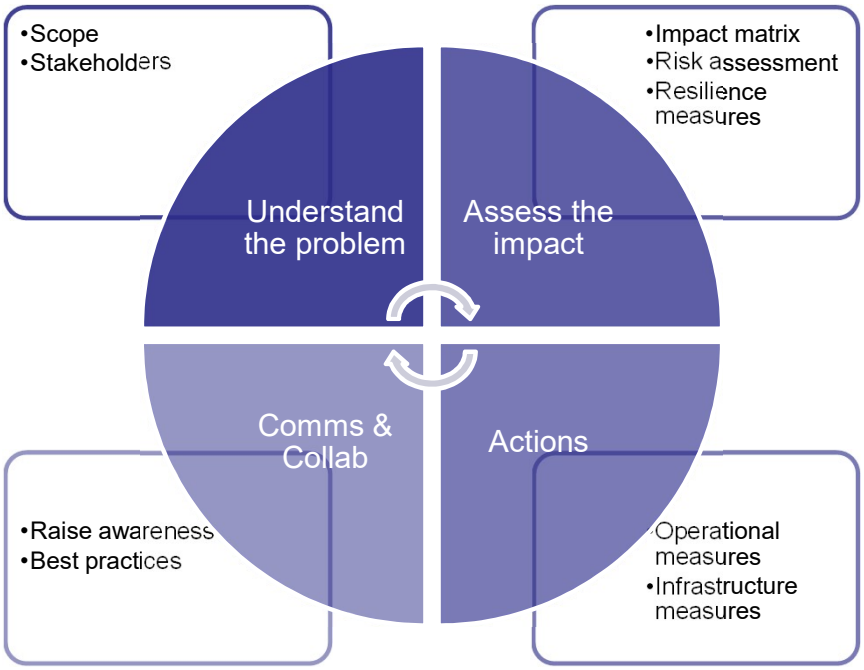
The record-breaking Boeing 787-9 Dreamliner. Norwegian



Changes in average flight time (2050)
source: EUROCONTROL Climate Change Risks for European Aviation 2021

Building aviation's climate resilience

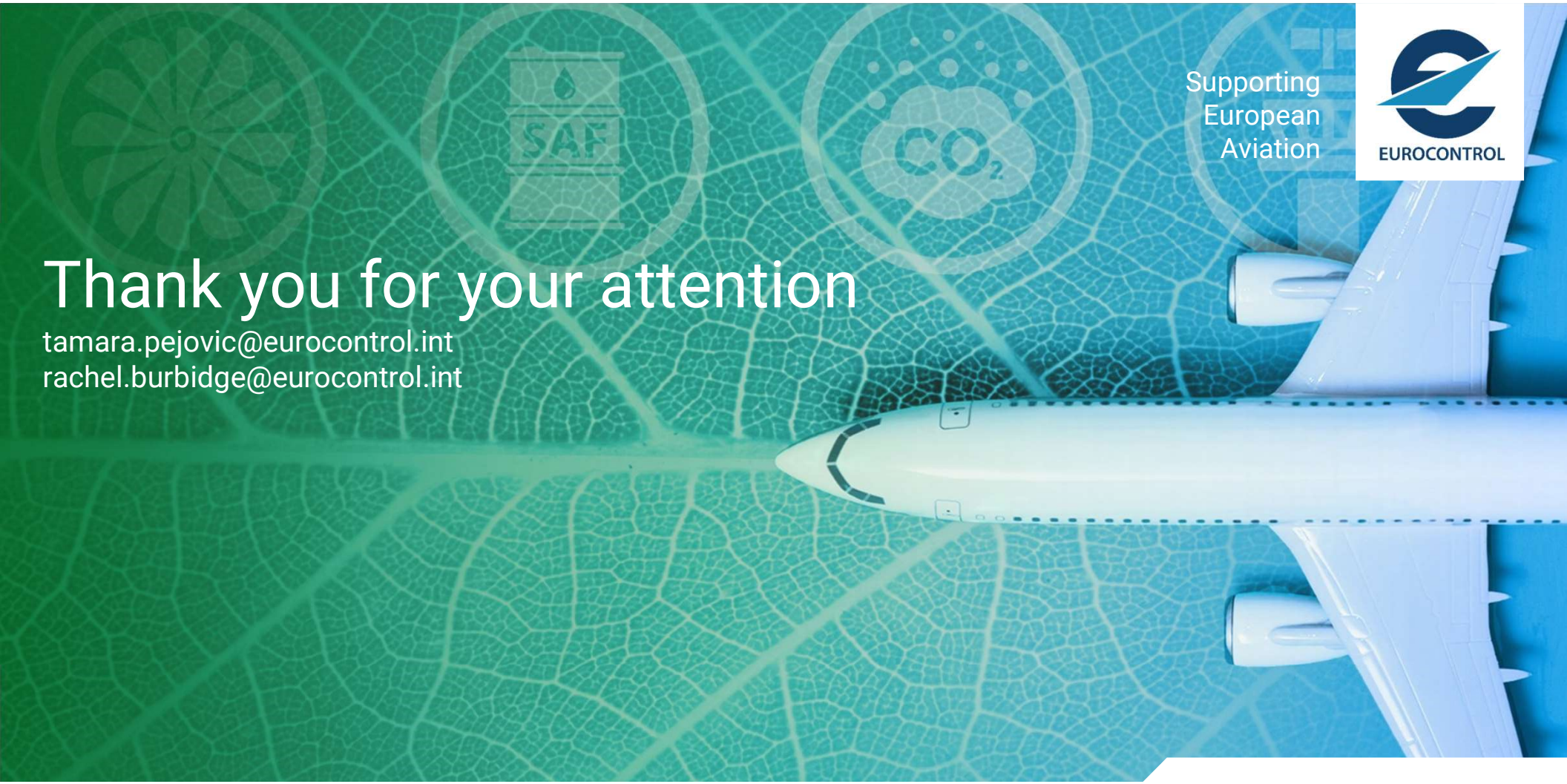
- Basic principles draw on safety management
- **ICAO Guidance** on Climate Change Risk Assessment and Adaptation Planning for Aviation Organisations: forthcoming
- **European Aviation Climate Adaptation Working Group**
  - facilitate a shared view on how to address the risks while minimising impacts upon operations
  - Build on ICAO guidance in an ECAC context
  - bring together scientific, technology and operational specialists



Find out more: Climate Change Risks for European Aviation 2021

- **An overview of short-term weather impacts on European aviation**
- **Impact of changes in storm patterns & intensity on flight operations**
- **Impact of sea level rise on European airport capacity**
- **Impact of climate change on tourism demand**
- **Impact of changes in wind patterns on flight operations**

https://www.eurocontrol.int/publication/eurocontrol-study-climate-change-risks-european-aviation



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Thank you for your attention

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