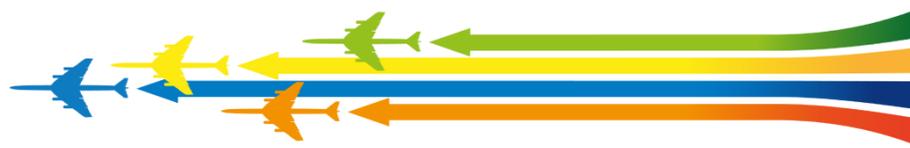




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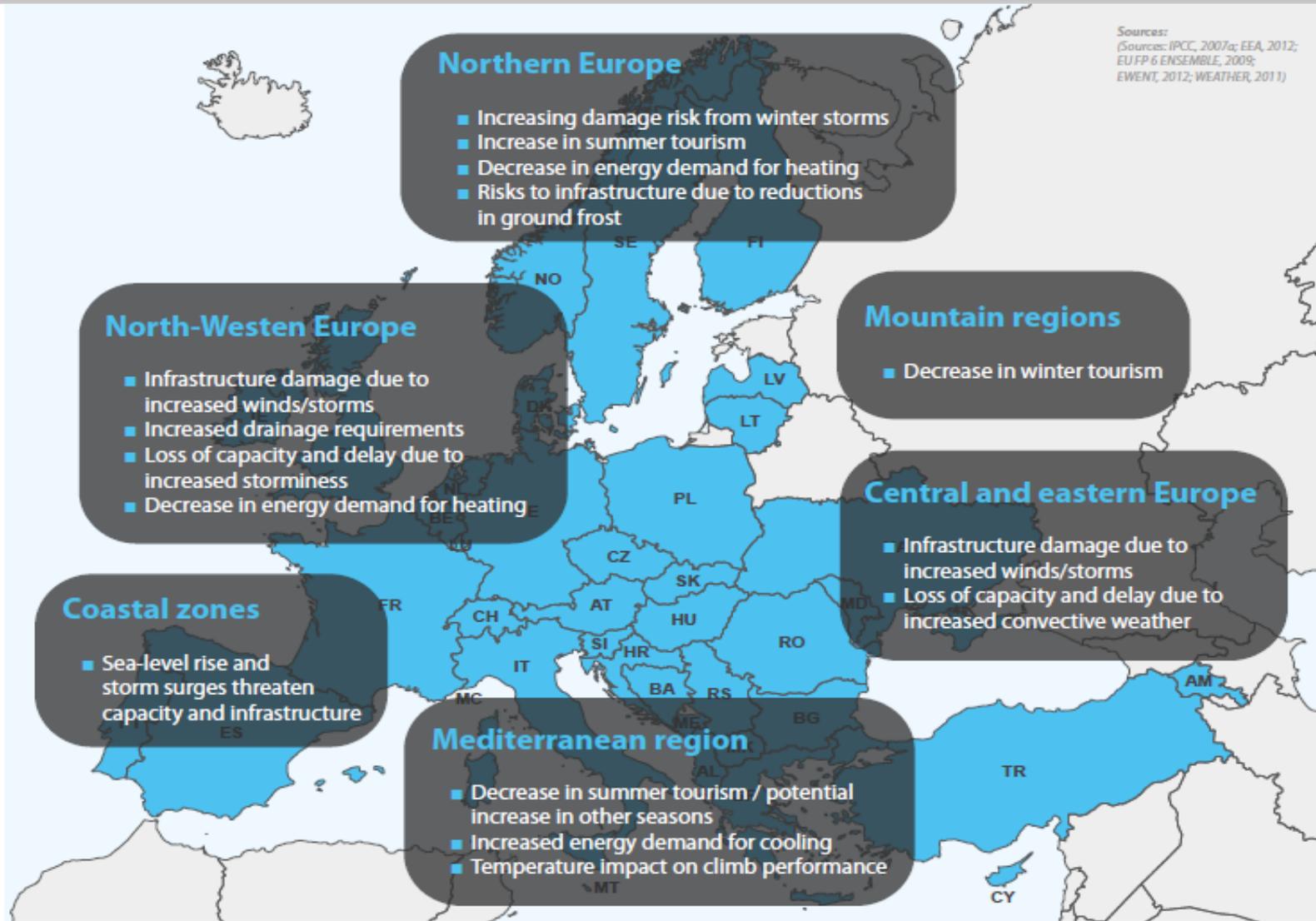
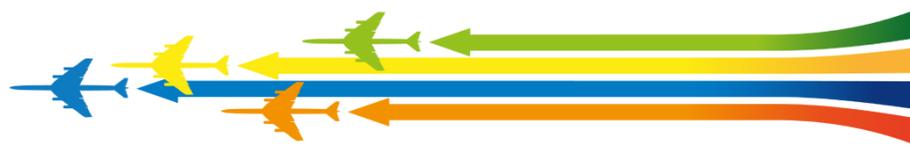
**E-GAP**

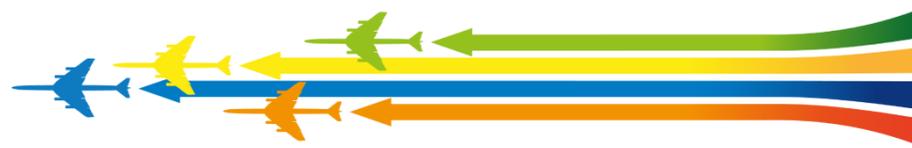


# ICAO Global Aviation Partnerships on Emissions Reductions (E-GAP)

## Multiplying Environmental Action: Adapting Aviation to a Changing Climate

Rachel Burbidge, EUROCONTROL

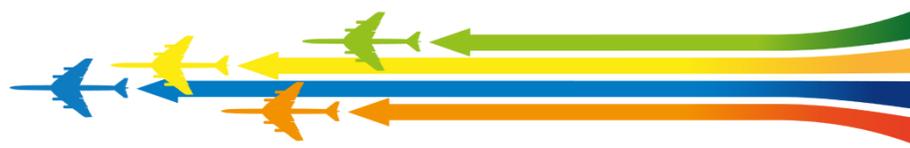




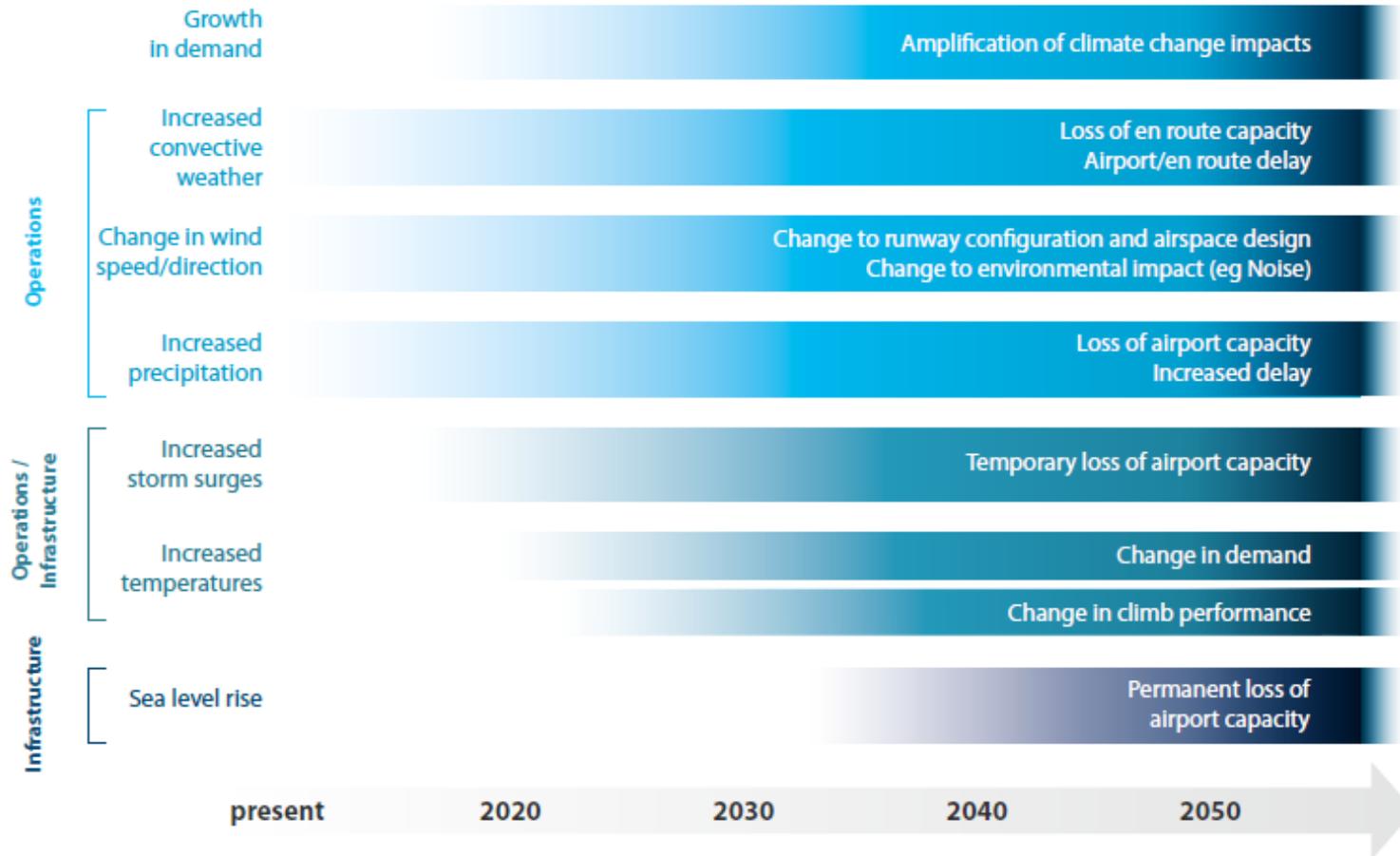
# Different stakeholders: different impacts

Climate Impact	Impact Area		
	En-route	airport operations	airport infrastructure
<b>Precipitation change</b>		disruption to operations e.g. airfield flooding, ground subsidence, reduction in airport throughput	drainage system capacity inundation of underground infrastructure e.g. electrical inundation of ground surface access
<b>Temperature change</b>		Changes in performance / noise impact	heat damage to airport surface (runway, taxiway) increased heating and cooling requirements
<b>Sea-level rise</b>	Impact on en-route capacity due to loss of ground capacity	loss of airport capacity	loss of airport infrastructure
<b>Wind changes</b>	convective weather: disruption to operations, route extensions jet stream: increase in en-route turbulence	convective weather: disruption to operations local wind patterns: disruption to operations, changes to distribution of noise impact	damage to infrastructure
<b>Extreme events</b>	disruption to operations, route extensions	disruption to operations	damage to infrastructure

Source: based on ACI-EUROPE, AEN, DGAC, EUROCONTROL, LHR, MMU, NATS (2014)



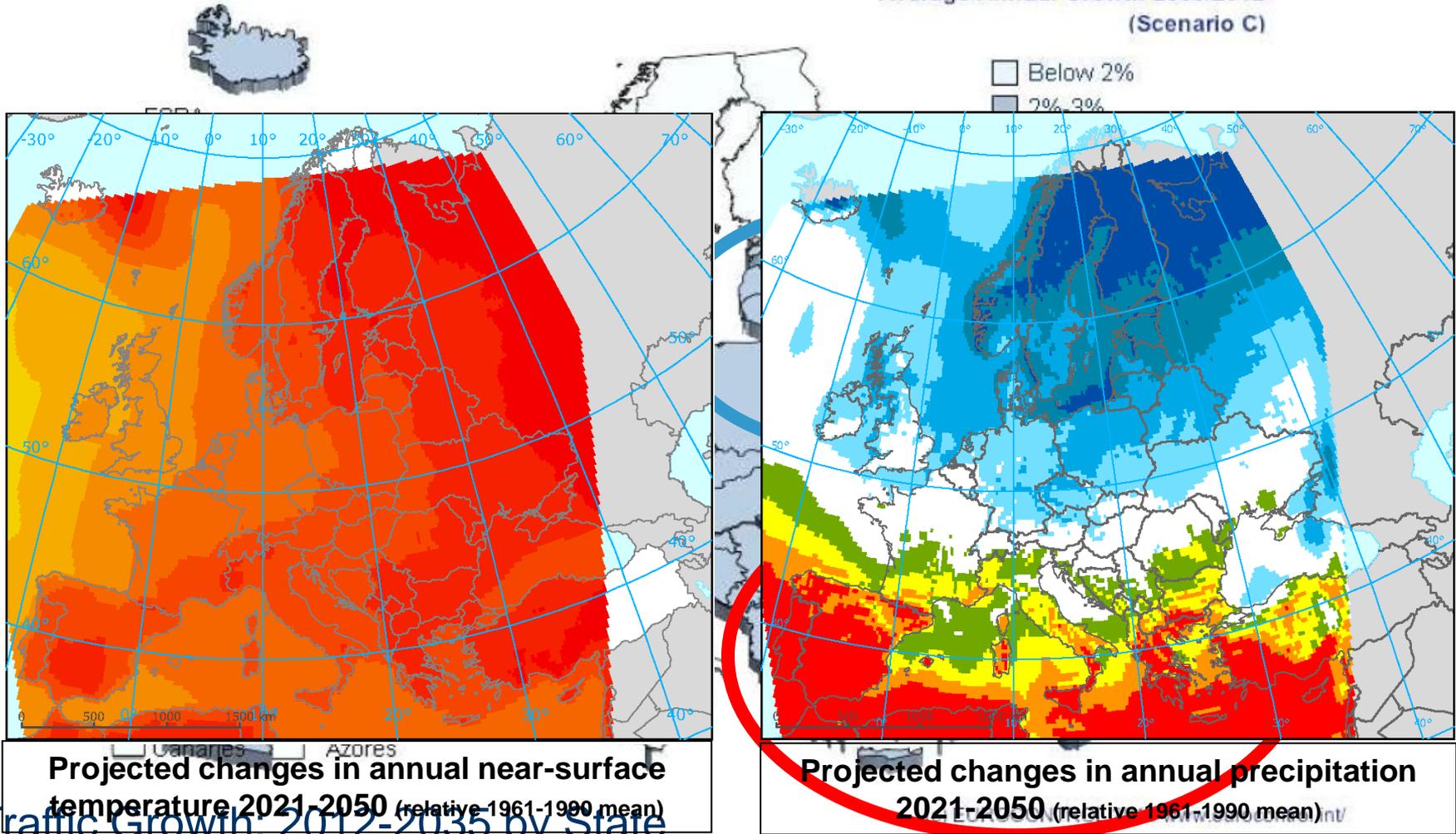
# When do we need to act?





# Growth and adaptation: a double challenge

Average Annual Growth 2035/2012  
(Scenario C)



Traffic Growth: 2012-2035 by State



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# Growth and adaptation: a GLOBAL challenge



ICAO Global Aviation Partnerships on Emissions Reductions (E-GAP) Seminar  
ICAO Headquarters, Montréal, 16 to 17 September 2015

ENV2015



# So, are we prepared?

## Challenges of Growth 2013:

### Two-stage stakeholder consultation

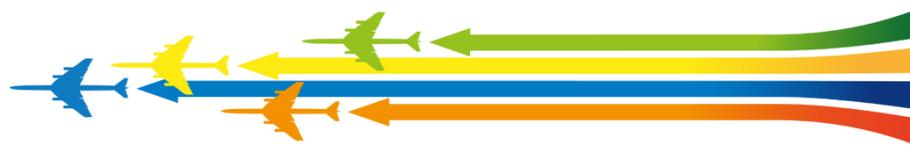


What does the European aviation sector think?

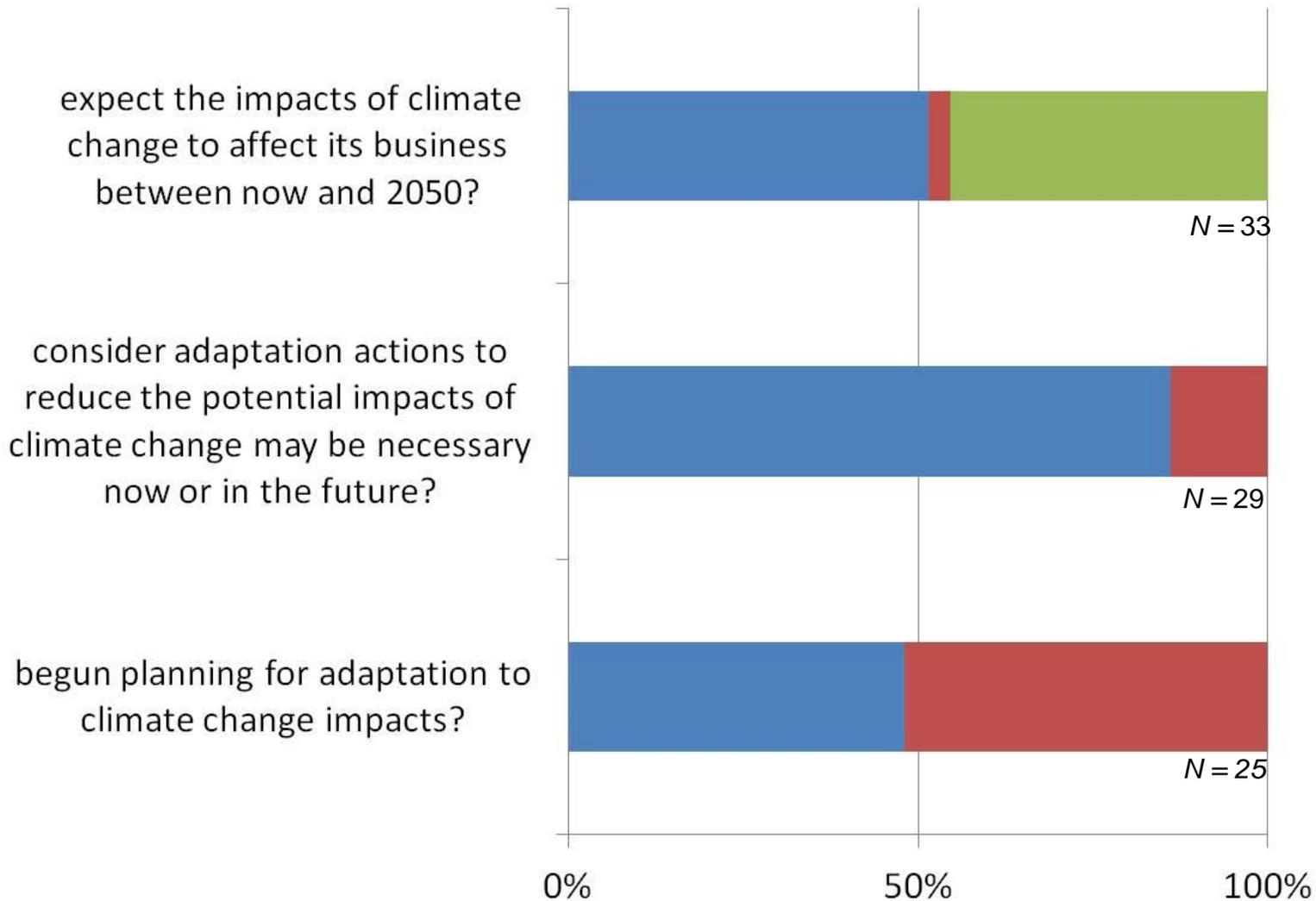
Might climate change affect its business and operations?

Should we consider taking measures to adapt?

What actions and initiatives are planned or underway?



## Does your organisation.....







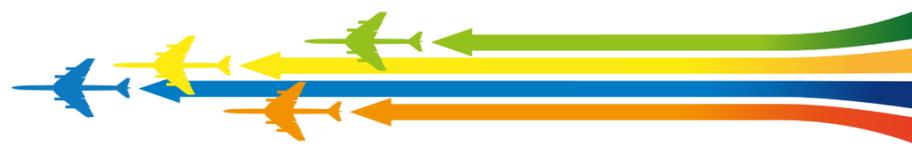
# Adapting aviation to a changing climate: what do we need to do?

Integrate resilience to climate change as routine part of operational and business planning

- Identify risks and vulnerabilities (network, regional, local)
- Identification/implementation of local and network resilience measures
- Build resilience into *current* infrastructure and operations planning.
- No-regrets measures (e.g. SESAR OIs)
- Cost-effective measures (e.g. training)
- Increased collaboration with MET (advanced forecasting techniques)

*Preemptive action is cost-effective*





EUR  
Adapt

Understanding  
the problem

Assessing the  
problem

15  
rities

Actions to  
adapt

Communication  
and  
collaboration



## Global challenge: global action

ISG

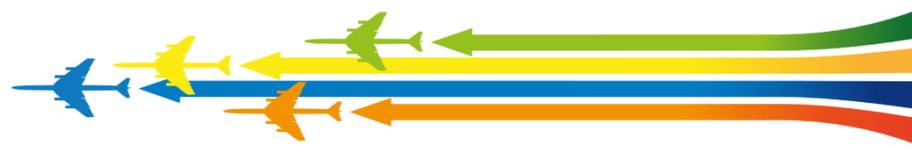
- Knowledge on impacts from a science perspective
- Knowledge on risk and resilience

WG2

- Update to airport planning manual
- Considering future work

And?

- Limit global network vulnerability
- Awareness raising/best practice: learn from each other



# Current state of knowledge on resilience

## What we know:

- Identify risks and vulnerabilities: global, regional, local, regional
- Implementation of local and network resilience measures
- Build resilience into *current* infrastructure and operations planning: routine part of operational and business planning
- “No-regrets” and “soft” measures (e.g. training) are cost-effective

*Preemptive action is cost-effective*

## And what next?

- Global network perspective: identify vulnerabilities and responses
- Uncertainties remain: what else do we need to know? Q
- Quantification of risks into operational impacts
- Communication and collaboration

*Dissemination and awareness-raising is key*





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# ICAO Partners multiplying environmentally sustainable aviation action

