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

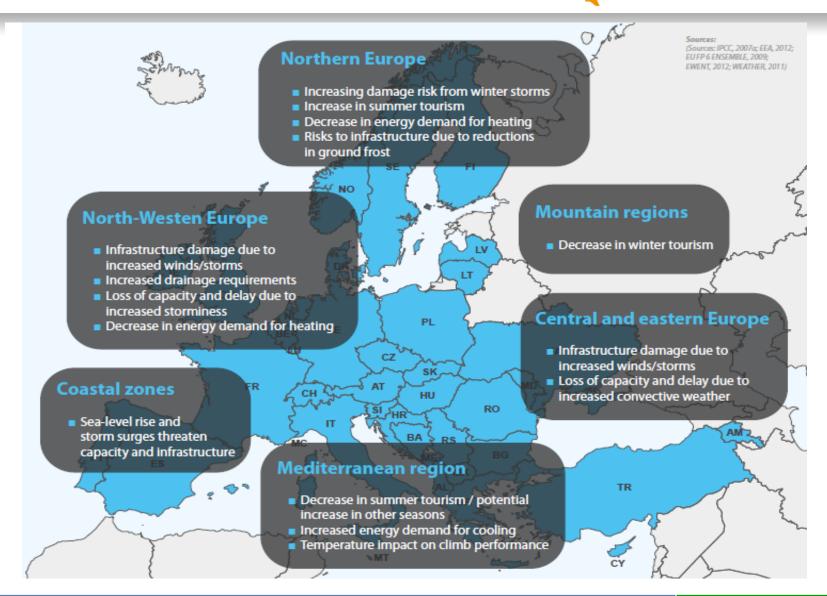
Multiplying Environmental Action: Adapting Aviation to a Changing Climate

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ICAO UNITING AVIATION

E-GAP



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

ENV2015



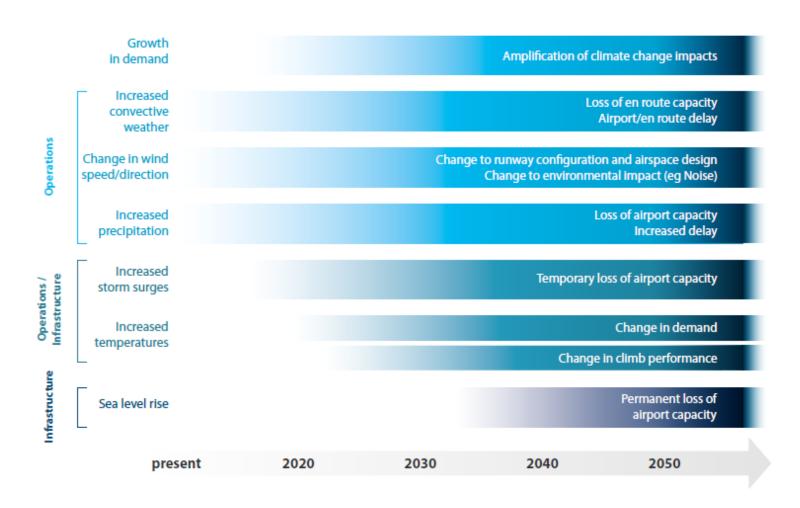
Different stakeholders: different impacts

Climate Impact	Impact Area		
	En-route	airport operations	airport infrastruture
Precipitation change		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
Temperature change		Changes in performance / noise impact	heat damage to airport surface (runway, taxiway) increased heating and cooling requirements
Sea-level rise	Impact on en-route capacity due to loss of ground capacity	loss of airport capacity	loss of airport infrastructure
Wind changes	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
Extreme events	disruption to operations, route extensions	disruption to operations	damage to infrastructure

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

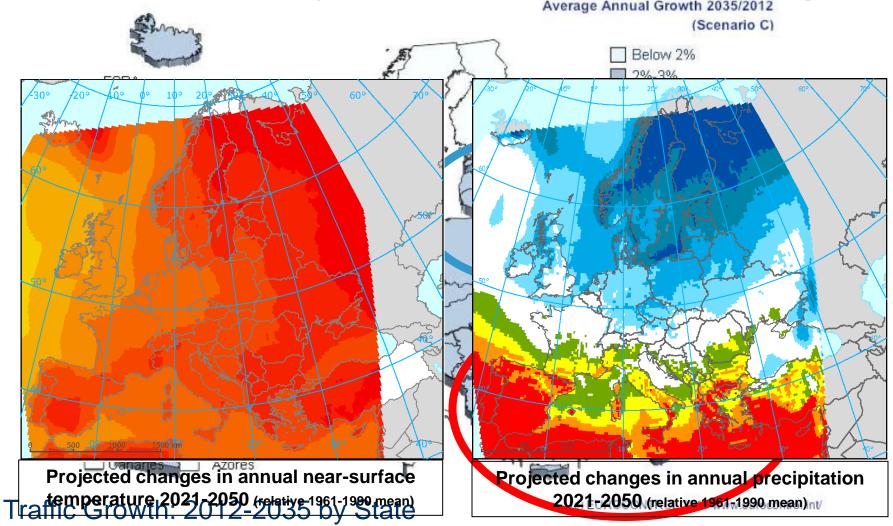


When do we need to act?





Growth and adaptation: a double challenge



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Growth and adaptation: a GLOBAL challenge





So, are we prepared?

Challenges of Growth 2013:

Two-stage stakeholder consultation





Should we consider taking measures to adapt?

What actions and initiatives are planned or underway?





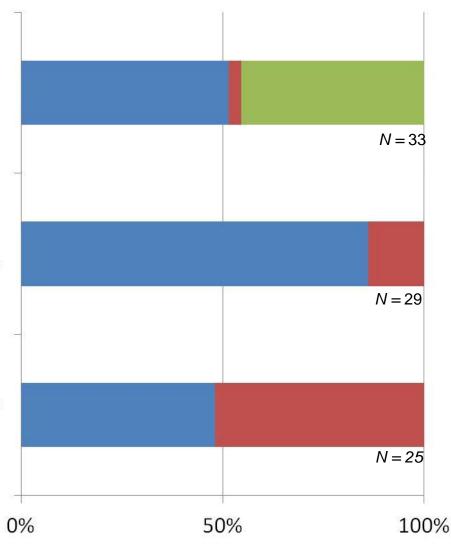


Does your organisation.....

expect the impacts of climate change to affect its business between now and 2050?

consider adaptation actions to reduce the potential impacts of climate change may be necessary now or in the future?

begun planning for adaptation to climate change impacts?





















Adapting Aviation to a Changing Climate

What does it tell us?

- What are the key risks for aviation?
- How can you assess whether climate change is a risk for your organisation?
- What are other organisations doing (case-studies)
- Where can you get further information (resource list)
- Website with additional information www.eurocontrol.int/resilience

http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_033.pdf

Aviation Climate Adaptation Resource List

A selection of resources for climate change risk analysis and adaptation planning. See the website www.eurocontrol.int/

Airport Cooperative Research Programme Synthesis: Airport Climate Adaptation and Resili

Maps current actions in EEA countries for adapting the transport system to climate change and identifies opportunities for further action at the European level in the next years

EU Adaptation Strategy Package - Adapting Infrastructure to Climate Change

Annex I provides an overview of climate risks and impacts for transport infrastructure, including aviation

http://www.eurocontrol.int/articles/challenges-growth

Reviews climate change risks out to 2050 and identifies key actions which the industry can take to reduce those risks.

EUROCONTROL Challenges of Growth 2008: Challenges of Growth Environmental Update Study and Climate Adaptation Case Studies http://www.eurocontrol.int/articles/challenges-growth

ropean Climate Adaptation Platform "Climate-Adapt" http://climate-adapt.eea.europa.eu/

Support in adapting to climate change. Access and sharing of information on expected climate change in Europe, vulnerability of region and sectors, National and transnational adaptation strategies, adaptation case studies and potential adaptation options tools that support

ICAO Environment Report 2013 Chapter 7: Adaptation

http://www.icao.int/environmental-protection/Pages/EnvReport13.aspx

Series of articles on the possible adverse effects which aviation activity may experience as a result of climate change and the adapto

esources on Risk Assessment for Aviation

DGAC Airport vulnerability on climate change

Overview of climate change risk assessment methodology for airports developed by DGAC France

http://archive.defra.gov.uk/environment/climate/documents/adapt-reports/08aviation/heathrow-airport.pdf Overview of climate change risk assessment carried out by Heathrow Airport Ltd.























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)

Premptive action is cost-effective





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

Premptive action is cost-effective

And what next?

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

Dissemination and awareness-raising is key













ICAO Partners multiplying environmentally sustainable aviation action





























