Addressing climate change adaptation in standards

CEN-CENELEC Guide 32

webinar of 2016-10-20

Addressing climate change adaptation in standards

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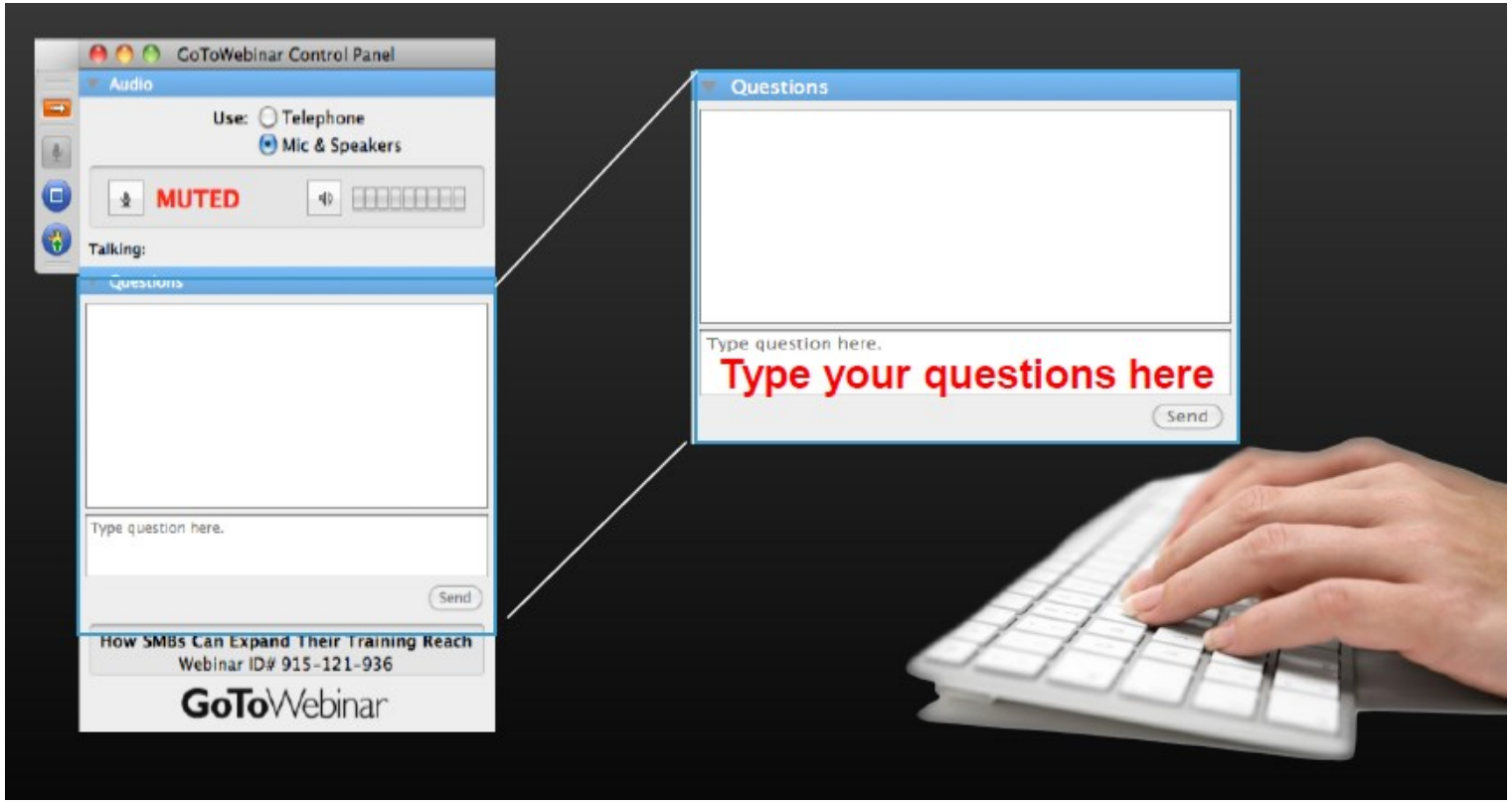
Addressing climate change adaptation in standards



Addressing climate change adaptation in standards

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Addressing climate change adaptation in standards

Content

- Reasons for the development of the guide
- Climate change and its impacts related to European standardization
  - The European Strategy
  - Challenges & opportunities
- How to use the CEN-CENELEC Guide 32?
  - The guide step by step
  - Examples
- Key learning points
- Q & A

The rationale of the development of the guide

The climate is changing

- The current global average temperature is 0.85ºC higher than it was in the late 19th century.
- In recent decades, changes in climate have caused impacts on all continents and oceans.
- Climate change is due to human activity (IPCC report findings)
  - If we carry on without addressing it sufficiently, we risk increasingly severe and irreversible impacts:
    - » rising seas,
    - » increasingly severe droughts and floods,
    - » food and water shortages,
    - » extreme events etc.
  - If we reduce the anthropogenic emissions of greenhouse gases, many associated impacts of climate change will still persist for centuries (IPCC).

What can be done?

- Strategies for reducing and managing the risks of climate change:
    - **Mitigation** - dealing with the causes of climate change by reducing emissions.
    - **Adaptation** - dealing with the unavoidable impacts of climate change.
- Adaptation and mitigation are complementary

How to adapt?

Adaptation

- anticipating the adverse effects of climate change
- taking appropriate action to prevent or minimise the damage they can cause or
- taking advantage of opportunities that may arise

Adaptation in standardization

- Mainstream adaptation considerations in key vulnerable sectors
    - Energy,
    - Transport
    - Construction
- Ensuring more resilient infrastructure - a long life span and high costs
- Develop new standards and/or revise standards

The rationale of the development of the Guide

- **EU Strategy on adaptation** to climate change - COM(2013) 216 final
- CEN/SABE initiative - **development of a supplement to CEN Guide 4** "Guide for addressing environmental issues in product standards (2008)"
- Commission Implementing Decision C(2014) 3451 final or **M/526** - 'Standardisation request to the European standardisation organisations in support of implementation of the EU Strategy on Adaptation to Climate Change' – standards in the priority sectors and guide on adaptation
- **CEN/SABE Climate Project Team** involving CENELEC
- **CEN-CENELEC Guide 32** "Guide for addressing climate change adaptation in standards" – published in April 2016
- CEN-CENELEC Guide 32 – offered to **ISO and IEC**

Climate change and its impacts related to European standardization

Vulnerable Europe

Arctic
Temperature rise much larger than global average
Decrease in Arctic sea ice coverage
Decrease in Greenland ice sheet
Decrease in permafrost areas
Increasing risk of biodiversity loss
Intensified shipping and exploitation of oil and gas resources

Northern Europe
Temperature rise much larger than global average
Decrease in snow, lake and river ice cover
Increase in river flows
Northward movement of species
Increase in crop yields
Decrease in energy demand for heating
Increase in hydropower potential
Increasing damage risk from winter storms
Increase in summer tourism

North-western Europe
Increase in winter precipitation
Increase in river flow
Northward movement of species
Decrease in energy demand for heating
Increasing risk of river and coastal flooding

Mountain areas
Temperature rise larger than European average
Decrease in glacier extent and volume
Decrease in mountain permafrost areas
Upward shift of plant and animal species
High risk of species extinction in Alpine regions
Increasing risk of soil erosion
Decrease in ski tourism

Coastal zones and regional seas
Sea-level rise
Increase in sea surface temperatures
Increase in ocean acidity
Northward expansion of fish and plankton species
Changes in phytoplankton communities
Increasing risk for fish stocks

Central and eastern Europe
Increase in warm temperature extremes
Decrease in summer precipitation
Increase in water temperature
Increasing risk of forest fire
Decrease in economic value of forests

Mediterranean region
Temperature rise larger than European average
Decrease in annual precipitation
Decrease in annual river flow
Increasing risk of biodiversity loss
Increasing risk of desertification
Increasing water demand for agriculture
Decrease in crop yields
Increasing risk of forest fire
Increase in mortality from heat waves
Expansion of habitats for southern disease vectors
Decrease in hydropower potential
Decrease in summer tourism and potential increase in other seasons

- The EU is already facing **unavoidable impacts of climate change**

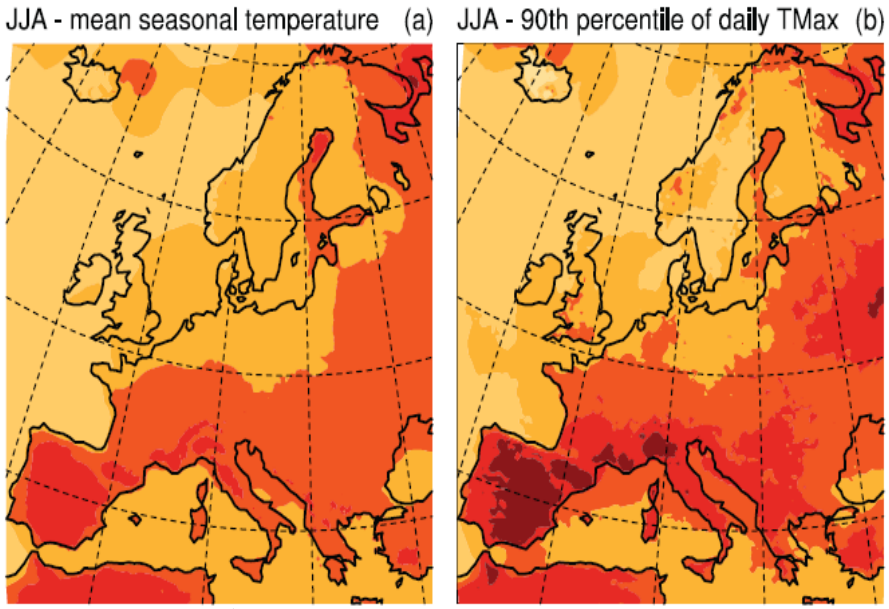
- **Impacts** will affect the full EU territory, with regional differences

- Average and extreme temperatures increases; changes in precipitation and flood patterns; more intense windstorms; droughts; sea level rise; coastal erosion; landslides etc.

CENELEC

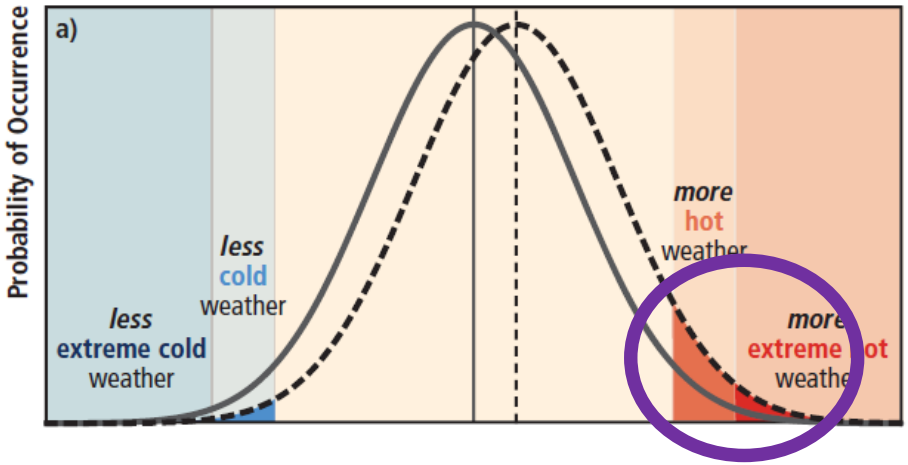
Climate change

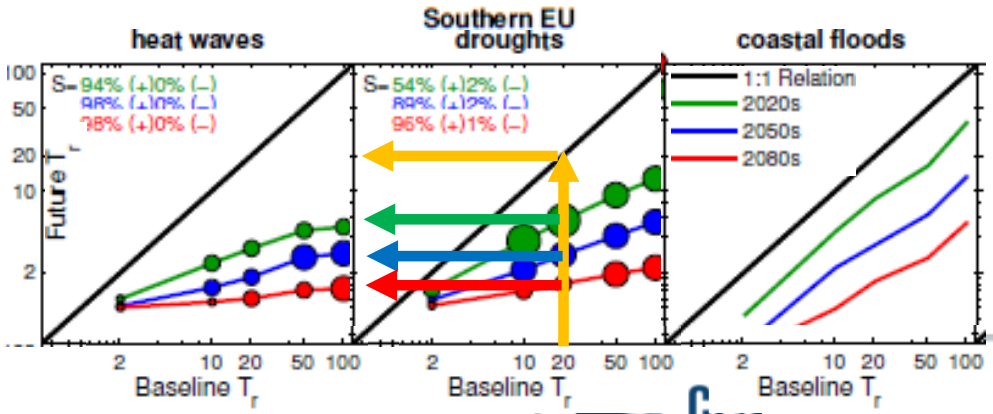
Slow on-set climate change



ENSEMBLES regional climate model 2016-2035 vs. 1986-2005

Extreme weather events





Changes in extreme climatic events

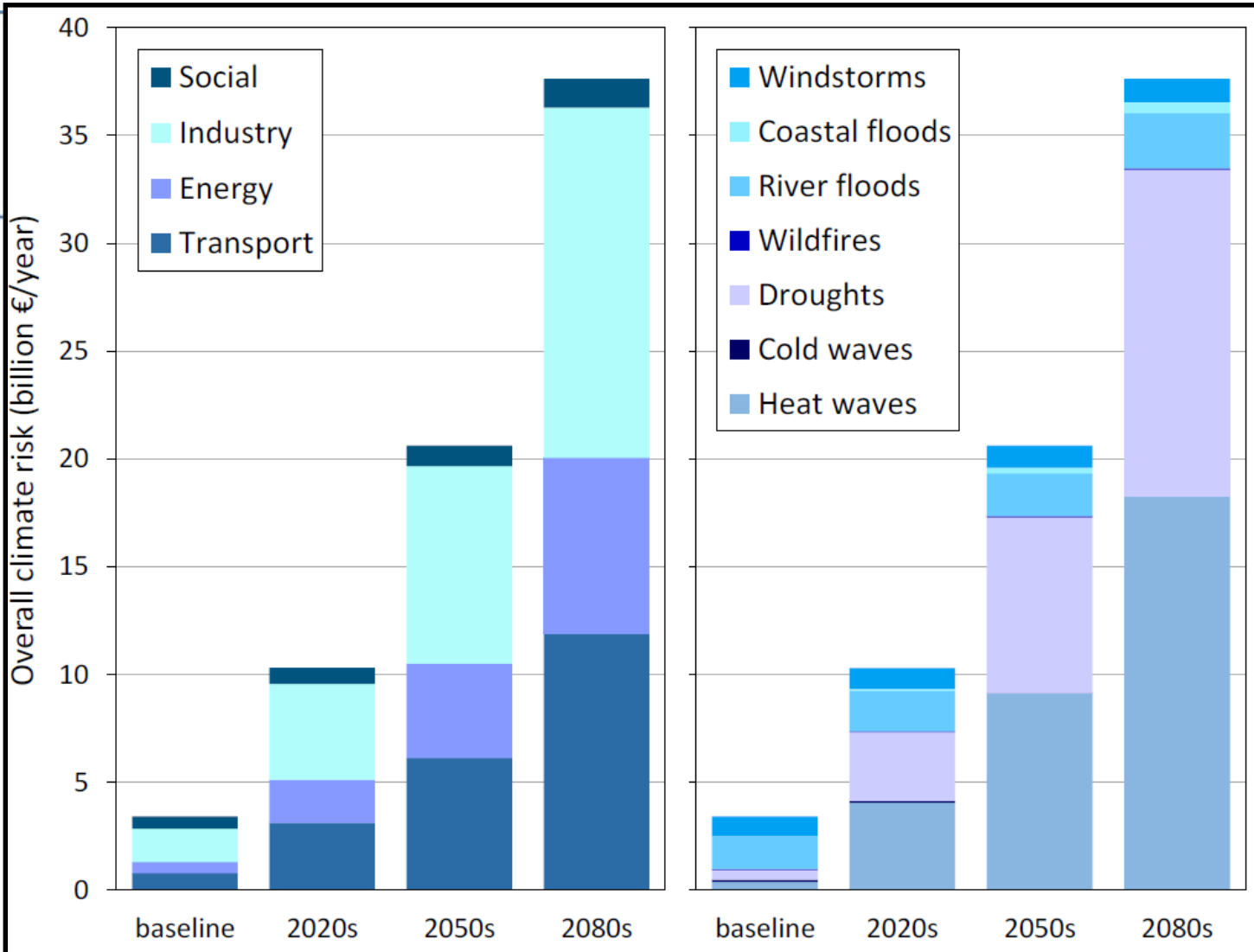
Source: Joint Research Centre, EC

Impacts

Impacts on infrastructure

"Potential damage from climate hazards to critical infrastructures in the energy, transport, industrial and social sector could triple by the 2020s, multiply six-fold by mid-century, and surpass 10 times today's total of 3.4 billion €/year by the end of the 21st century"

Source:
JRC Technical Report "Resilience of large investments and critical infrastructures in Europe to climate change"



Evolution in the 21st century of climate hazard damages to critical infrastructures in the EU28 + Switzerland, Norway and Iceland. Losses are undiscounted and expressed in 2010 €, assuming no socioeconomic change in future scenarios (hence reflect the effects of future climate on current economy).

EU Strategy on adaptation to climate change

Priority 1: Promoting action by Member States

Action 1. Encourage MS to adopt Adaptation Strategies and action plans

Action 2. LIFE funding, including adaptation priority areas

Action 3. Promoting adaptation action by cities along the Covenant of Mayors initiative

Priority 2: Better informed decision-making

Action 4. Knowledge-gap strategy

Action 5. Climate-ADAPT

Priority 3: Adaptation in key vulnerable sectors

Action 6. Climate proofing the Common Agricultural Policy, Cohesion Policy, and the Common Fisheries Policy

Action 7. Making infrastructure more resilient

Action 8. Promote products & services by insurance and finance markets

Climate change adaptation in standardization

Challenges & opportunities

Challenges

- Inherent **uncertainties** about future climate conditions
  - …should not prevent suitable action being taken now
- **New topic** being brought to the attention of standardisation

Opportunities

- **Operational framework** - ongoing work on the Mandate M/526
  - Coordination Group on Adaptation to Climate Change (ACC-CG)
  - CEN-CENELEC Guide 32
  - Synergies with the Mandate M/515 (Eurocodes)
  - Building synergies with the work of ISO
- **Policy framework** – strong support
  - EU Strategy on Adaptation to Climate Change
  - Paris Agreement – impetus for adaptation
- **Wider context** of infrastructure resilience to climate change
  - EUFIWACC Guidance

Further information:

- DG Clima web site:
http://ec.europa.eu/clima/policies/adaptation/index_en.htm

- Climate-ADAPT
http://climate-adapt.eea.europa.eu/

- JRC study on resilience of EU infrastructure:
https://ec.europa.eu/jrc/en/news/upcoming-climate-hazards-hit-hard-europe-s-industry-transport-and-energy-infrastructure

- EUFIWACC guidance
http://ec.europa.eu/clima/publications/docs/integrating_climate_change_en.pdf

The CEN-CENELEC Guide 32 guide step by step

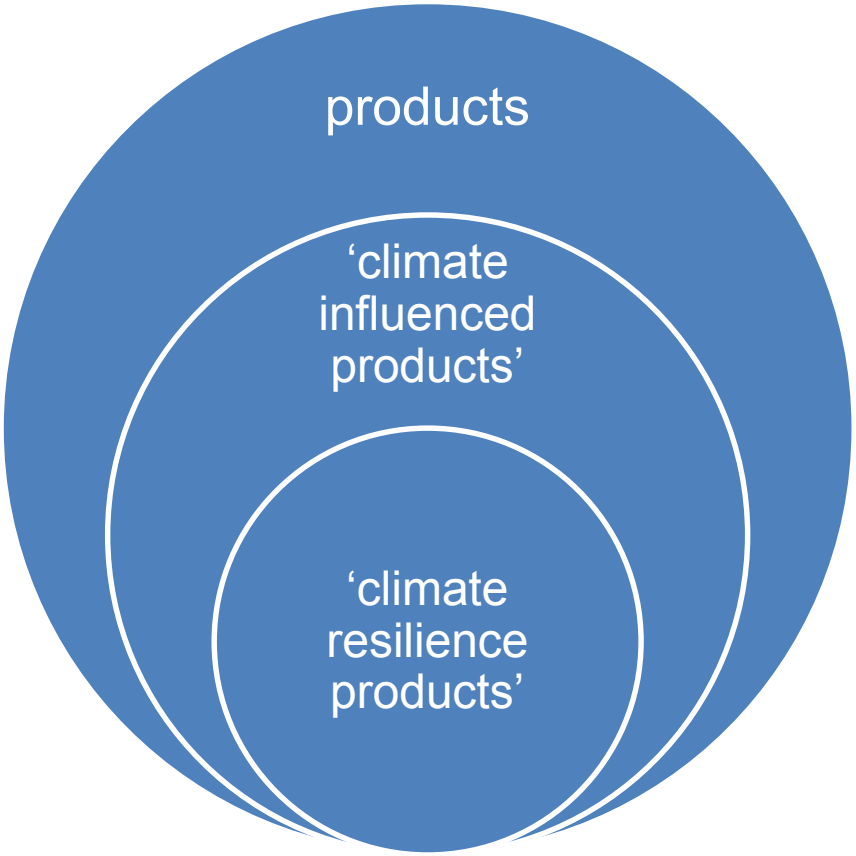
How to translate it to your work?

The purpose and scope of Guide 32

Guide 32 is intended to:

- help standards writers identify relevant climate impacts and include adaptation considerations in new or revised standards

The purpose and scope of Guide 32



Products:

- material products; services; test methods; infrastructure

Climate influenced products:

- fitness for purpose may be affected if climate is ignored

Climate resilience products:

- main aim is to reduce vulnerability

The purpose of Guide 32

But it is **not** intended to:

- be a guide to adaptation (more than standards)
- lead to standardization in the level of risk that organisations or individuals accept

How to use Guide 32

Getting Started

- Determine whether it is relevant using initial checklist (5.1)
- Background reading (introduction and Annex A)

Explore climate impacts

- Use section 4.3 to identify potential climate related impacts on the use stage
- Read section 3.6 and identify any systemic impacts

Plan your approach

- Use decision tree & checklist to tailor the approach (5.2)
- Refer to Sections 3 & 4 in support of any planned action

Getting started

Checklist

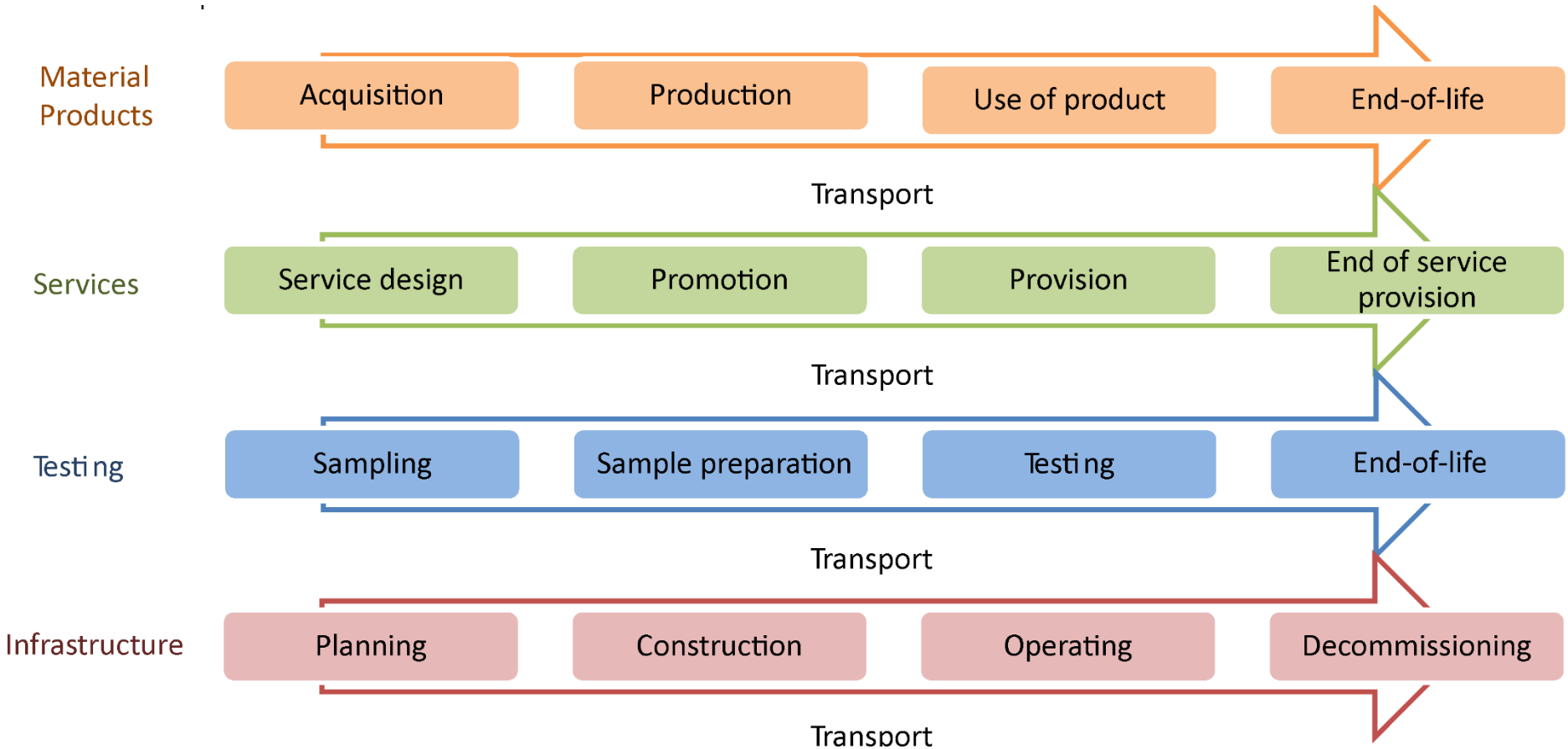
- A set of simple yes/ no questions
- Will determine whether issue is relevant

Background reading to understand:

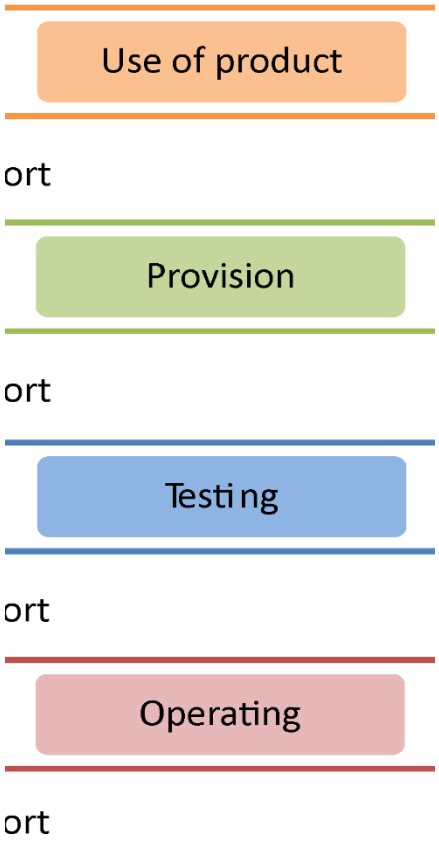
- The need to adapt
- The key issues in Europe

Exploring relevant climate impacts

- The life cycle approach



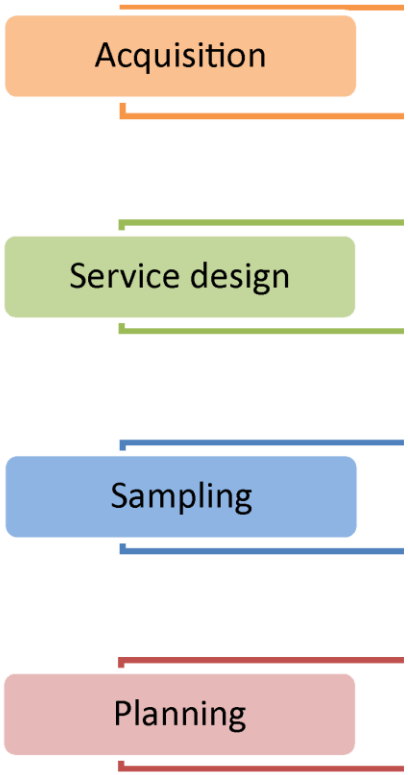
Exploring relevant climate impacts
Use stage



Examples

- Excessive temperatures lead to de-rating of overhead wires
- Surface water flooding prevents access to train services
- Drought leads to lack of cooling water availability for power station

Exploring relevant climate impacts
Acquisition stage



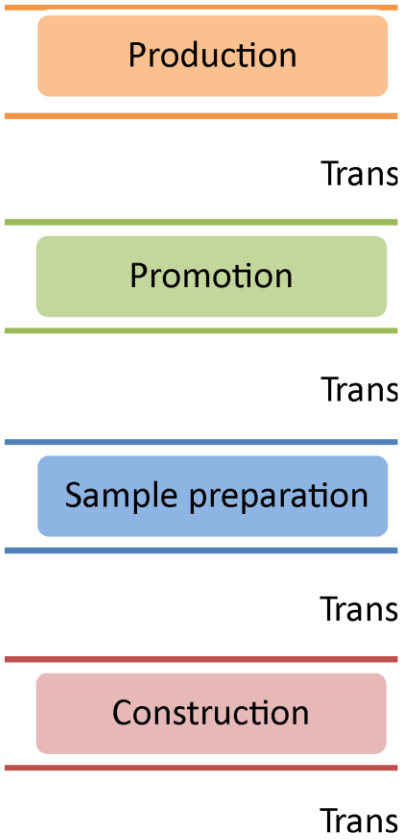
Examples

- Difficulty in sourcing timber required for wooden product due to climate impacts on source forest

- Key component not available due to main supplier being flooded

- Difficulty in obtaining testing samples due to severe weather in impacts on producer

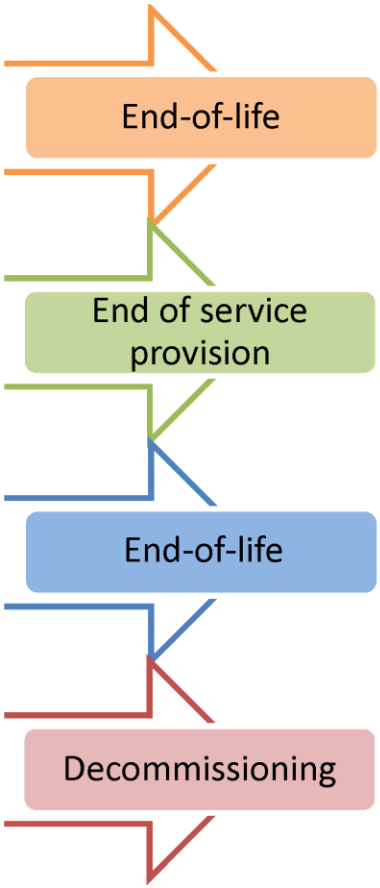
Exploring relevant climate impacts
Production stage



Examples

- Specialised publication that requires water-intensive printing process
- Factory that produces a key component located in a vulnerable area
- Construction of infrastructure asset delayed by inclement weather

Exploring relevant climate impacts
End of life stage



Examples

- Weather related wear and tear means that construction waste not able to be reused.

- Decommissioning of nuclear power plant- activities are unsafe due to inclement weather.

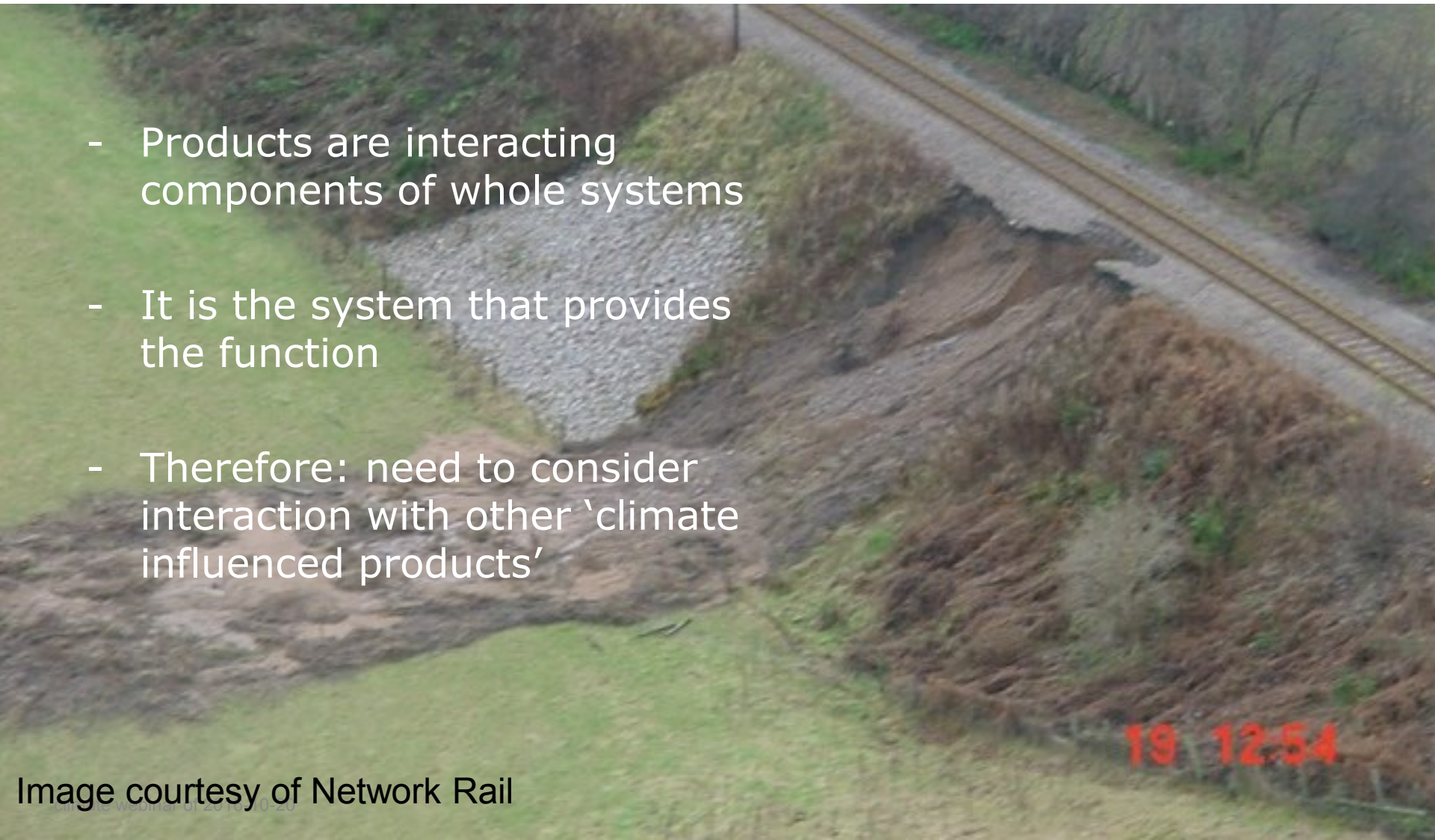
Exploring relevant climate impacts
Transport stage

- Impacts on port infrastructure prevent import/ export of products

- Staff not able to get to work due to disrupted public transport

- Customers not able to access services due to closed roads

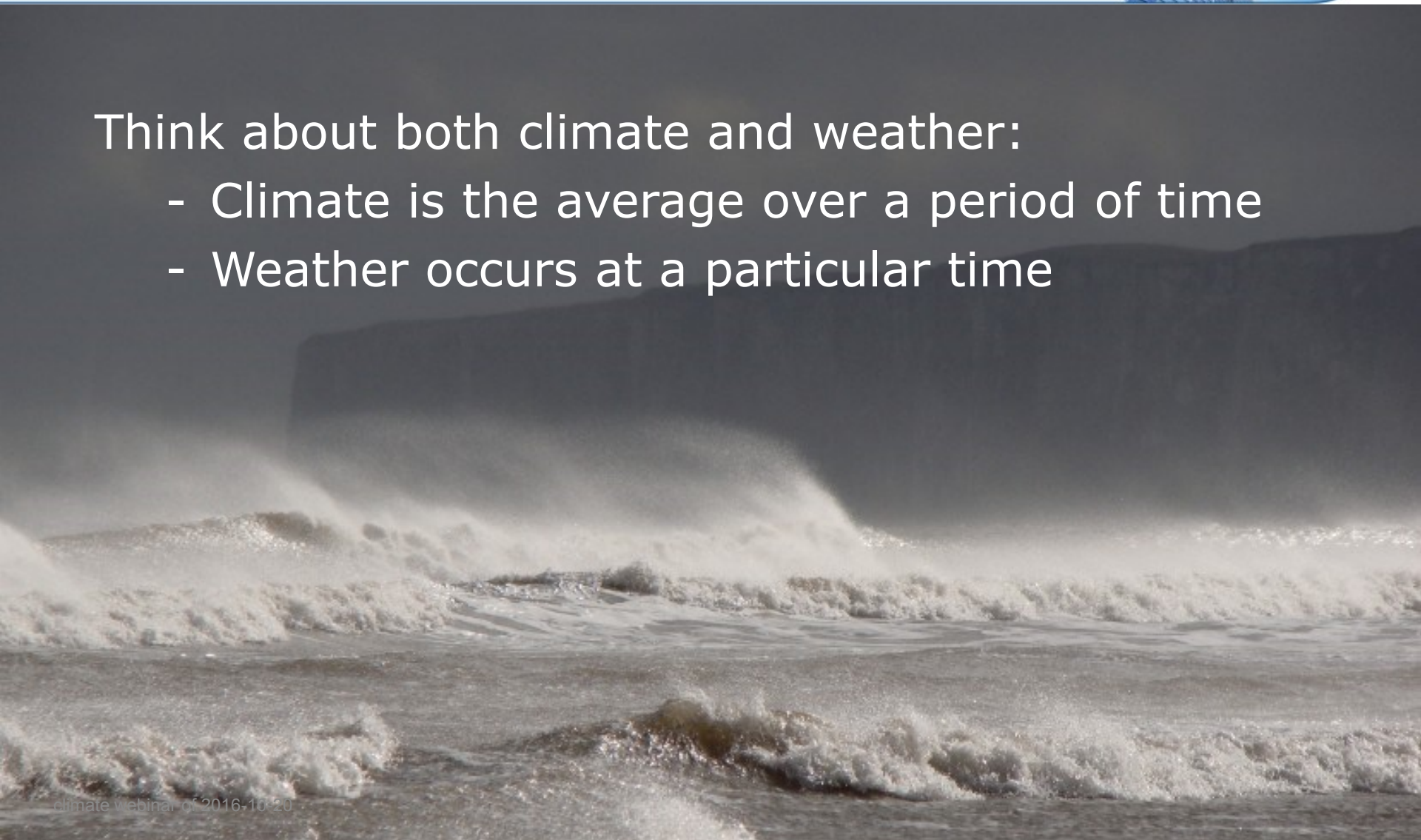
Exploring relevant climate impacts
Systemic impacts



- Products are interacting components of whole systems
- It is the system that provides the function
- Therefore: need to consider interaction with other 'climate influenced products'

Image courtesy of Network Rail

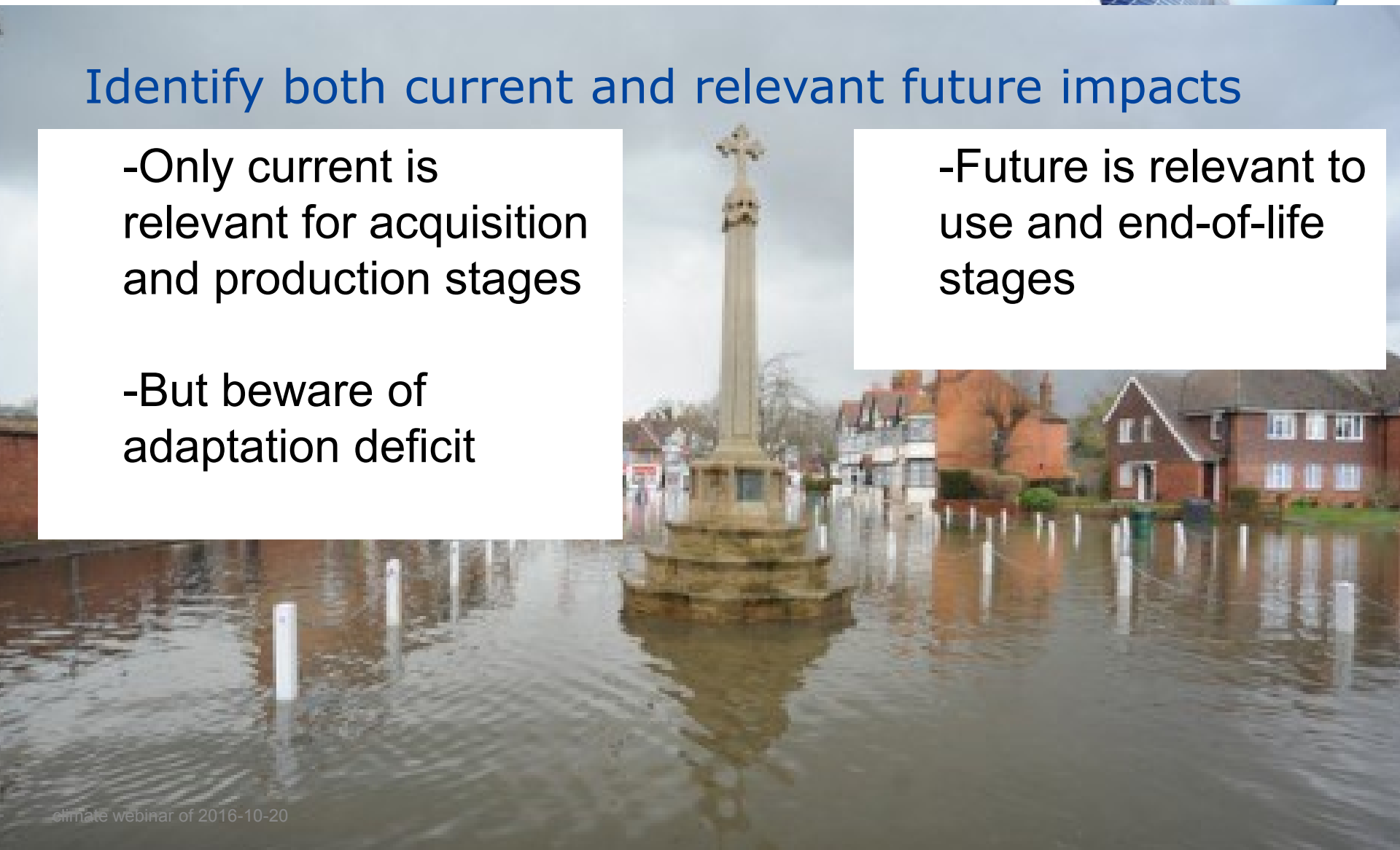
Exploring relevant climate impacts
Weather and climate



Think about both climate and weather:

- Climate is the average over a period of time
- Weather occurs at a particular time

Exploring relevant climate impacts



Identify both current and relevant future impacts

-Only current is relevant for acquisition and production stages

-But beware of adaptation deficit

-Future is relevant to use and end-of-life stages

Taking action

Types of action

- New/ updated provisions in standards
  - So that design can take account of climate impacts
- New/ updated information in standards
- Research to fill information gaps
- Capacity building as part of standard development process

Tailoring your approach

- Approach depends on
  - New or existing standard
  - 'climate resilience' or 'climate influenced' standard
  - Assumptions and information currently used

- Section 5.2 asks questions in order to provide a shorter tailored checklist

Research

For example into:

- Adaptation options that could be incorporated into design (see section 3.4.3 and 3.5)
- Thresholds
- The future climate
- Appropriate climate change factor (allowance)

Information in standards

For example:

- Weather threshold information
- Future climate information
- Climate impacts information
- Guidance on how to use new information

Provisions in standards

For example:

- The required level of resilience
- Labelling
- Product design changes (see section 4)
  - Adaptive measures
  - Design for exceedence
  - Design for degraded performance
  - Think about the whole system (see section 3.6)

The standard development process

For example:

- Timing of reviews/ updates
- Incorporating outputs of relevant research
- Discussions about:
  - Uncertainty
  - Role of the standard in this area

Example: BSI Drainage standards

- Design choices affect the rate at which drainage systems can remove water
- The flow of water needs to be taken into account
- In the UK, drainage design is standardized in the national annexes to:

  1) EN 12056-3 for the design of roof drainage systems and

  2) EN 752 for the design of underground drainage systems.

Example: BSI Drainage standards Tailored checklist

Checklist	Example
Identify a range of adaptation options that could be incorporated in product design	-Larger downpipes -Water storage -SUDS
Identify relevant climate variables and impacts	-Short duration rainfall intensities -Overflowing drains, surface water flooding
Check available information sources to see if relevant information is available- if not then start checklist again	NO

Example: BSI Drainage standards
Tailored checklist

Checklist (research)	Example
Identify any thresholds that are described or implied in existing climate information	Maps indicate return period and rainfall intensity Return periods imply 'design for exceedence' but not used this way
Identify relevant climate variables and impacts	What information is possible (future? or at least more up to date current info)
Research to identify an appropriate climate change factor	Available factors not suitable - work ongoing in this area

Example: BSI Drainage standards Tailored checklist

Checklist (information)	Example
-Consider the use of a climate change factor	Not possible yet
-Give extra consideration to the intended lifetime and consider inclusion of climate information from multiple time periods	Decided not worth a major piece of work to reprocess historical detail
Climate related impacts on the acquisition and production stages may occur in other regions of the world not currently considered. Make sure climate information takes this into account	For infrastructure systems acquisition = planning and production = construction so not relevant

Example: BSI Drainage standards Tailored checklist

Checklist (provisions)	Example
Consider no regrets options	Considering specifying systems more flexible to future upgrade
Consider adaptive measures	Sensitivity testing when upgrading
Consider designing for exceedance	Attention drawn to this need and clarity of language ‘percentiles’ better than ‘return periods’
Consider 'designing for degraded performance	Discussion about requiring the consequences of failure to be taken into account
Consider how to encourage increased resilience to indirect impacts from weather and climate	n/a

Example: BSI Drainage standards Tailored checklist

Checklist (development process)	Example
-Agree when climate information will need updating	Already needs updating
-Set out a process for incorporating the outputs of research as part of standards revision (including how and when)	Current revision will take account of staged approach and percentile language. Future revisions to incorporate new climate science. TC link to scientific community
-Make time for a discussion of uncertainty and roles in decision-making	Discussion on the capacity of the standard users

Key learning points

1. Failure to take account of climate change in standards will lead to some products that are not fit for purpose

2. Mitigation and adaptation are complementary strategies

3. To find the optimum approach
   - use life cycle approach
   - think about the whole system

4. Use the checklists to tailor your approach

Addressing climate change adaptation in standards

Time for questions

THANK YOU !

17 November 2016

CEN-CENELEC Guide 33 addressing environmental issues in testing standards

Keep in touch: anam@cencenelec.eu

Addressing climate change adaptation in standards

Please fill out the short exit survey !

It will take 2 minutes

