

WORKSHOP // MARCH 17TH AND 18TH 2021

# Climate resilience and design codes - factoring in climate projections

Aligning infrastructure standards with information about the future climate

## Outline of CEN M526 Desk Study Summary of content

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# Desk Study - the Brief

- This study collates and signposts current initiatives related to data for infrastructure standards in support of the CEN Phase 2 Extension under the M/526 mandate
- Some 55 standards and the Structural Eurocodes have been reviewed as part of this exercise, for weather/ climate parameters
- Part of Task 1 of the Extension work
  - Task 1 aims to deliver an outline for a Technical Report on use of data in standards
  - Prioritised on Structural Eurocodes
  - March 2021 workshop part of this Task

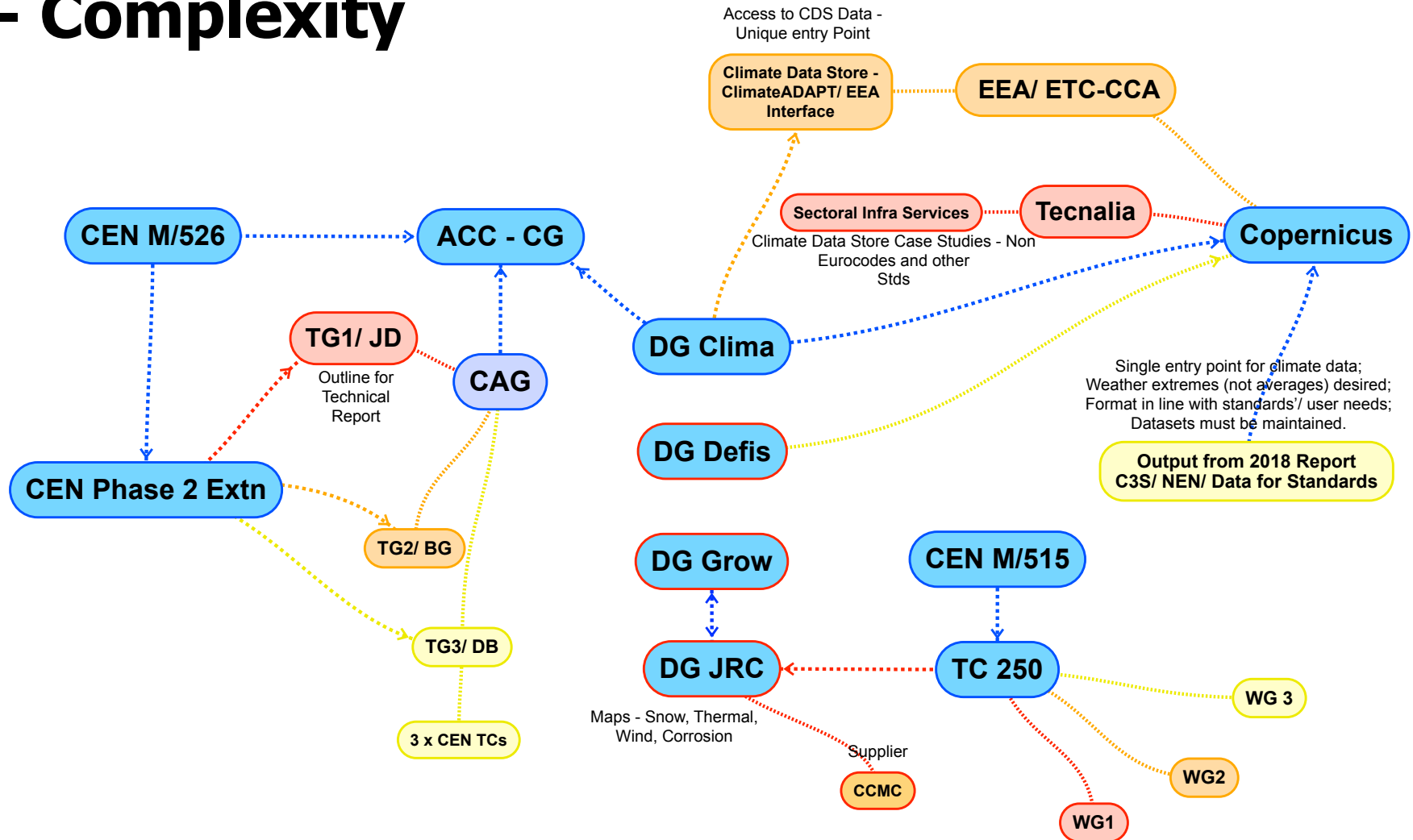
# Desk Study - Contents

- **Standards' 'landscape'**
- **Identification of data needs in Eurocodes and other infrastructure standards**
- **C3S Report: Climate data needed to address resilience to climate change in standards for infrastructures**
- **Conclusions**
- **ANNEXES**
  - Standards' 'landscape'
  - Existing initiatives
    - CEN 32 and ISO Guide 84
    - EC Mandate 515
    - The framework of task SC1/T5
    - Copernicus Climate Change Services (C3S) SIS-Infra and ClimateADAPT/ EEA
  - Structural Eurocodes – EN 1991 Series 'Actions on Structures'

# Desk Study – Identification of data needs

- Structural Eurocodes
  - Concentrated upon Snow, Wind and Thermal loading
- Other infrastructure standards
  - Long list of prioritised standards
  - Building, Transport, Energy sectors
- Listed in Desk Study
- Complementary to
  - EC Mandate 515
  - The framework of task SC1/T5
  - Copernicus Climate Change Services (C3S) SIS-Infra and
  - ClimateADAPT/ EEA
- Complex involvement

# Desk Study - Complexity



# Desk Study – Sample outputs – EN

EN 752	Drain and sewer systems outside buildings - Sewer system management	Rainfall intensity - depth of rain falling in unit time, or volume of rain falling in unit time per unit area	5.2.3 Hydraulic performance requirements (abridged) [...] There are two commonly used methods of setting hydraulic performance requirements within the drain and sewer system: — The expected frequency of sewer flooding in any year, or the return period of sewer flooding. — The expected frequency of surcharge in drains or sewers can be specified depending on the type of property impacted and the expected frequency that surcharge would result in sewer flooding	This European Standard specifies the objectives for drain and sewer systems outside buildings. It specifies the functional requirements for achieving these objectives and the principles for strategic and policy activities relating to planning, design, installation, operation, maintenance and rehabilitation.	
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(There are 40+ such entries)



# Desk Study – Sample outputs – EN 1915

EN 1915-1 and 1915-2	Aircraft ground support equipment - Part 1 - General Safety Requirements - Part 2: Stability and strength requirements, calculations and test methods	Thresholds specified e.g. 40 knot wind gust		Design of airport ground-handling equipment.	This standard specifies thresholds so is independent of climate change. Part 2 is within initial Phase 2 work. Within initial Phase 2 work.
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# Desk Study – Sample outputs – EN 1991-1-3

EN 1991-1-3:2003	Eurocode 1: Actions on structures - Part 1- 3:	Requires information on “snow load” on the ground.		EN 1991-1-3 gives principles and rules to determine the values of loads due to snow to be used for the structural design of buildings and civil engineering works.	Sourced from draft prEN, 2020.
	General actions - Snow loads.	1 in 50 year return period, $\text{kN/m}^2$			



# Desk Study – Conclusions 1

- Some standards specify climate parameters using historical data
  - Generally 1961 – 1990 Climate – out of date!
  - Work for designers is reduced as local data is offered
  - Future – and current - climate markedly different
- Some standards require *designers* to source data
  - Then analyse averages/ extremes
  - Could mean near-current data sets are relevant
- Some standards specify climate thresholds
  - e.g. EN 1915 wind speed parameter as a design criterion for airport equipment
- Last two perhaps less 'future climate data' dependent
  - But frequency might have a bearing on continual operability of equipment

# Desk Study – Conclusions 2

- There are many initiatives
  - Complex web of players
  - Complementary work in progress
- Outline for a Technical Report (not the report!) aims to:
  - Structure guidance on what data is available for standards
    - Users and writers?
  - Offer ways to access the data
  - Cover reliability and robustness of data
  - Explain technical matters e.g bias correction, climate / data terms
  - Align with next generation Eurocodes
- All to permit flexibility and best use of climate data as the science improves

# Questions for Panel

- What guidance should be included in the Technical Report?
  - Structure guidance on what data is available for standards.
    - For whom? Users and writers?
  - What ways to access the data?
  - Interested in reliability and robustness of data?
  - Do we need to explain technical matters e.g bias correction, climate / data terms?
  - How much should it align with next generation Eurocodes?
- What about flexibility?
  - Being able to use of climate data as the science improves?
  - How to deal with in National Annexes or other guidelines?

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## THANK YOU!

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