USER ENGAGEMENT IN PRIMAVERA: PROGRESS AND NEXT STEPS

Meeting hosted by Dragana Bojovic (BSC, Spain)

Meeting presentation by Erika Palin and Galina Guentchev (Met Office, UK)

With thanks to all of our colleagues in the PRIMAVERA user engagement and climate risk assessment teams

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OUTLINE

- What is PRIMAVERA?
- How are we engaging with users?
- What have users told us?
- How are we using users' feedback in the project?
- Summary

WHAT IS PRIMAVERA?

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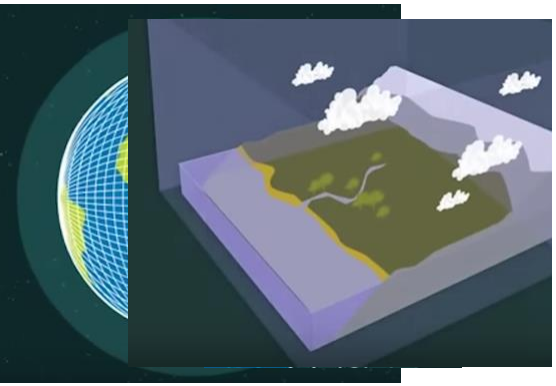

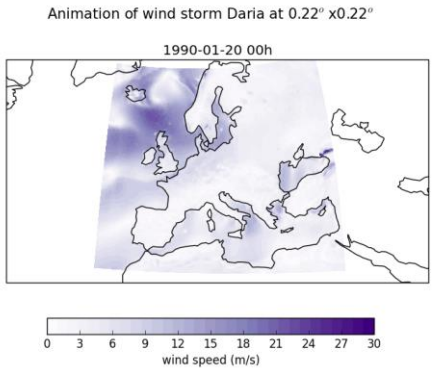

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- PRIMAVERA is a European Commission-funded project about designing and running **new high resolution global climate models,**

and assessing their **ability to simulate societally important processes,**

and thereby providing information to **support climate risk assessment activities** across Europe.

PRIMAVERA video: https://youtu.be/sTU7VKZHjEQ

PROJECT STRUCTURE AND PROGRESS

PRIMAVERA THEMES

Innovations in modelling
- Harnessing the latest climate model developments

Flagship simulations for CMIP6
- Linking in with major international (IPCC-related) modelling activities

Drivers of European climate
- What key processes influence the climate of Europe?

Process-based assessment
- How well do PRIMAVERA models simulate key processes?

Climate risk assessment & user engagement
- YOU!

PRIMAVERA PROGRESS

- **Current status**:
  - Atmosphere only simulations **completed** for the historical period
  - Coupled models simulations are **under way** for the historical period
  - User engagement in progress – survey, interviews, summary of information

Atmosphere only model simulations, forced with observed and modelled sea-surface temperatures

Coupled Global Climate Models simulations – atmosphere, land, ocean, sea ice

USER-FOCUSED WORK

USER ENGAGEMENT APPROACHES

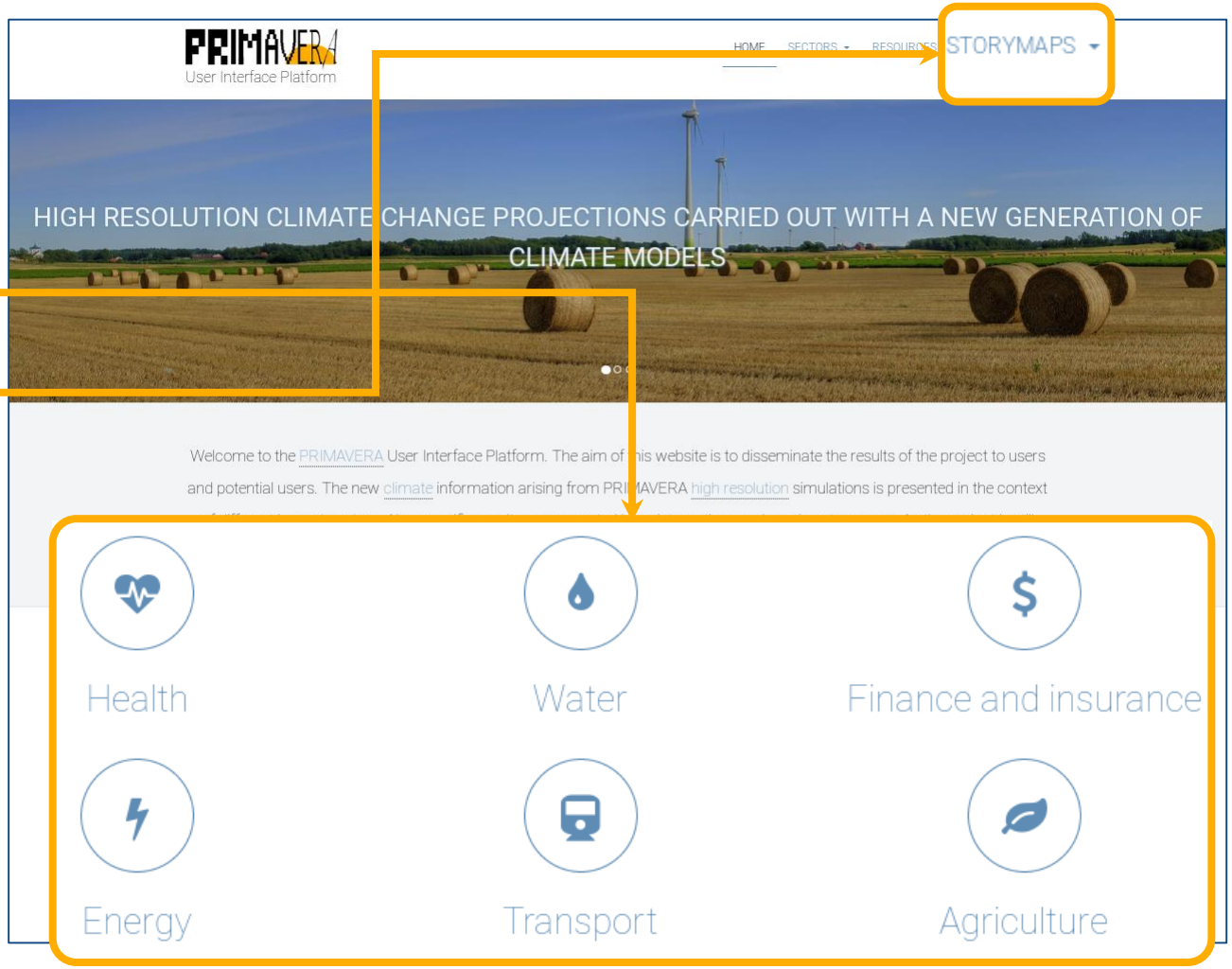
- Video (>300 views)
- Survey (>80 replies)
- Email list (75 subscribers)
- Twitter – @PRIMAVERA_H2020

- Interviews (47, across six sectors)

- Conferences: both science- and user-focused
- Webinars and virtual meetings (starting today!)
- Workshops (pending)
- Use cases

USER ENGAGEMENT APPROACHES

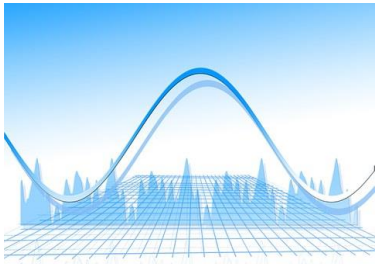
- **User Interface Platform** (http://uip.primavera-h2020.eu)
- **User-relevant** content, focused on key **sectors** of engagement
- Sector-focused **storymaps and factsheets** highlighting expected benefits of higher resolution, including:
  - Heatwaves / energy
  - Flooding / transport
  - Windstorms / insurance
  - Post-tropical cyclones / agriculture



SOME RESULTS

HIGH-LEVEL FINDINGS:
WEATHER / CLIMATE CHANGE KNOWLEDGE & EXPERIENCE

- **Participants:**



Research and development (academic / government)

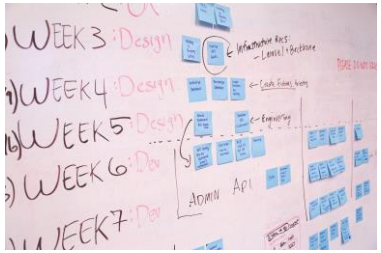
Risk modelling

Consulting

Governing and regulatory organizations

Operations and management

Planning

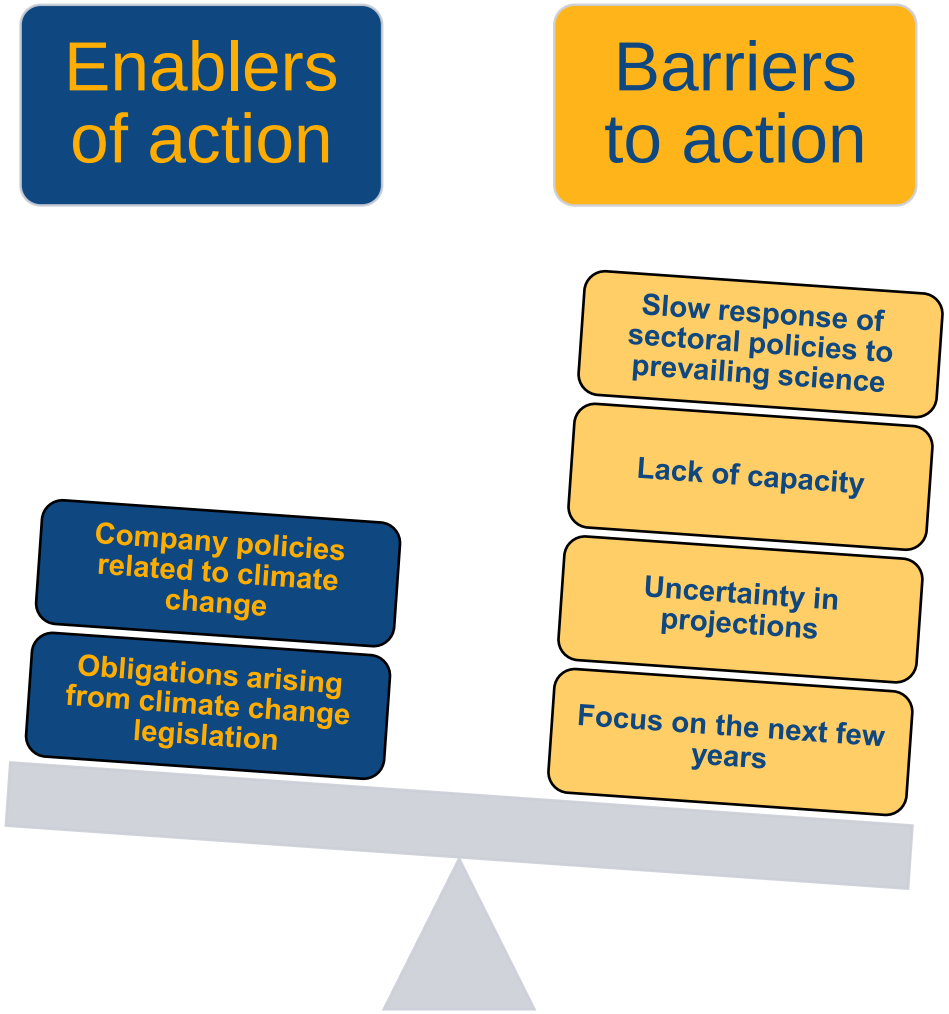


- **Wide range of knowledge/experience** with weather and climate and using weather/climate change information – depending on individuals / nature of their roles

Exploring	Learning	Applying
What information is out there? Will climate change impact us?	How will climate change impact us?	How to include climate change considerations in our work?

HIGH-LEVEL FINDINGS:
ATTITUDES TO CLIMATE CHANGE

- **Widespread acknowledgement** of climate change and its potential effects
- **Variation** in responding to the challenge of climate change, but no obvious pattern
- Some dependence of approaches **on the perceived size of the problem**



WHICH HAZARDS AFFECT / INTEREST YOU?

	Impact							
	No effect	Little	Moderate	Large	V. large			
	1	2	3	4	5	Mean (sd)		n
High T / heatwaves	6%	19%	28%	24%	22%	3.4	(1.2)	67
Low T / cold snaps	9%	33%	19%	15%	24%	3.1	(1.3)	67
Snow / ice / frost	4%	21%	30%	13%	31%	3.5	(1.3)	67
Rainfall & related flooding	4%	12%	16%	22%	46%	3.9	(1.2)	68
Coastal hzds inc. flooding	29%	18%	13%	13%	26%	2.9	(1.6)	68
Droughts	21%	15%	19%	22%	24%	3.1	(1.5)	68
High winds	9%	18%	6%	19%	49%	3.8	(1.4)	68
Lightning / conv. storms	22%	19%	15%	21%	22%	3.0	(1.5)	67
Earth mov't (landslips etc)	40%	17%	15%	8%	20%	2.5	(1.6)	65

- **Rain/flooding** & **high winds** are the most impactful (sector-wise) / interesting (research-wise) hazards
- **Landslips** are the least impactful / interesting

...but there is **sectoral variation** (not shown here)

WHICH TIME HORIZONS INTEREST YOU?

Many people use historical data, but there is variation in how far back in time they look

For people using future data, how far out they look depends on their area of work:

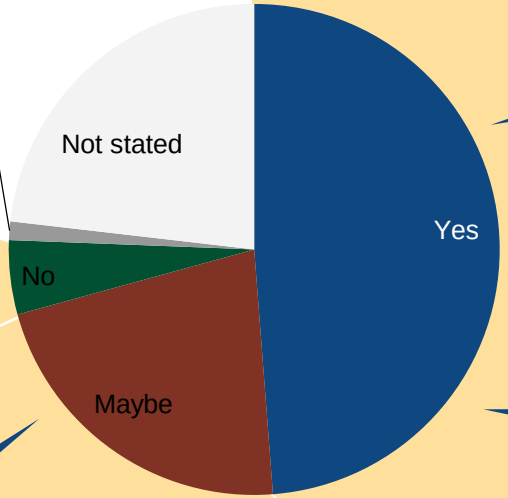
- Operational = shorter term
- Strategic / planning = longer term

Generally, only those working in **research** looked across multiple timescales

Some people are interested in year-to-year variability in the present day

WHAT ABOUT (SPATIAL) RESOLUTION?

Would the higher-resolution information provided by PRIMAVERA be useful to your organisation?



Best predictability of **extreme events**

Hazard information at these resolutions **rarely exists** at present

Good starting point for **further downscaling**

Impact studies require local information

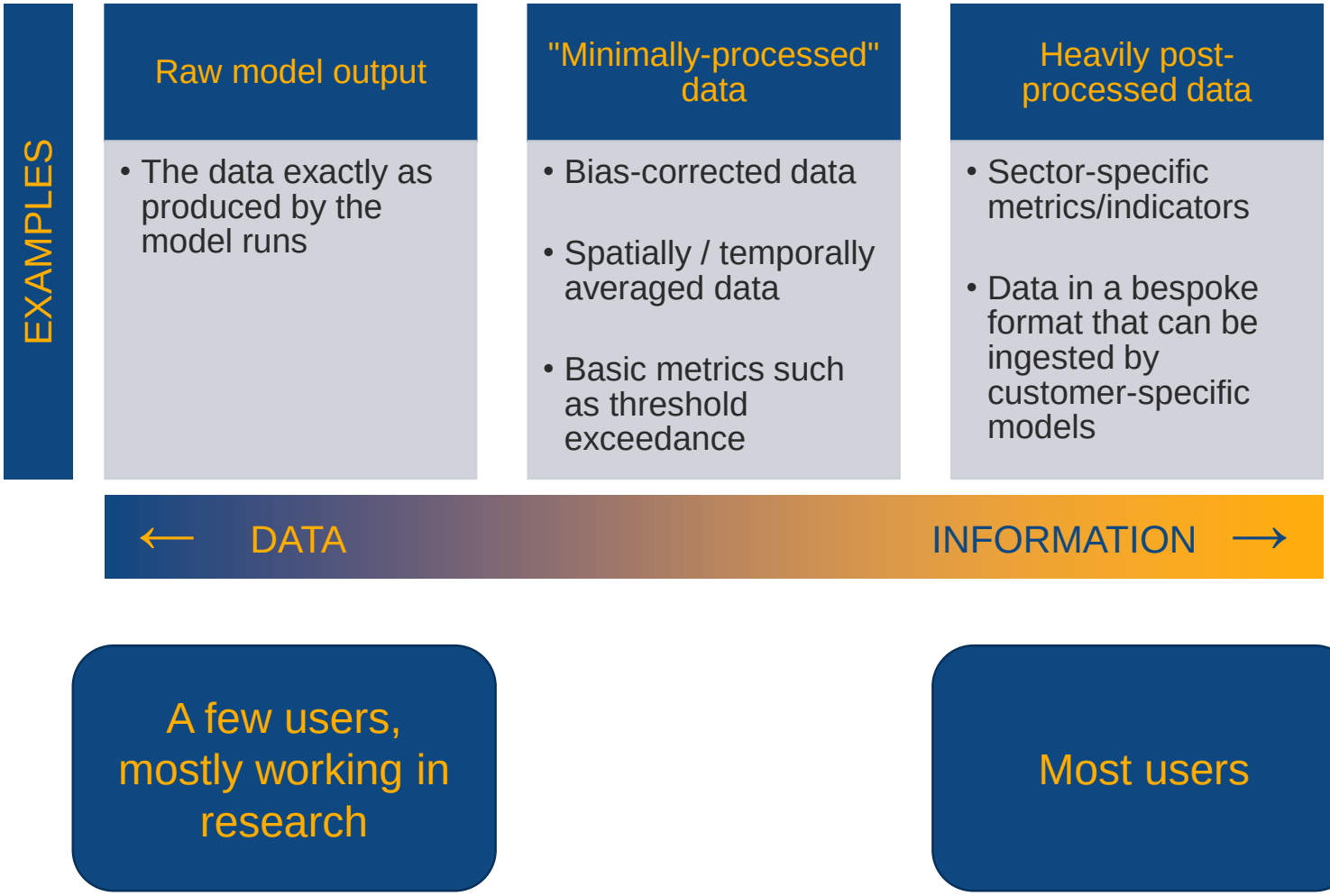
Focuses only to the **hazard** (physical event itself), while we deal with **risk**

Finer scale helps, but the main question is: **how to use the available data?**

We have **very good resolution**

Not applicable

“DATA”, OR “INFORMATION”?



WHAT PRODUCTS / OUTPUTS WOULD YOU LIKE FROM PRIMAVERA?

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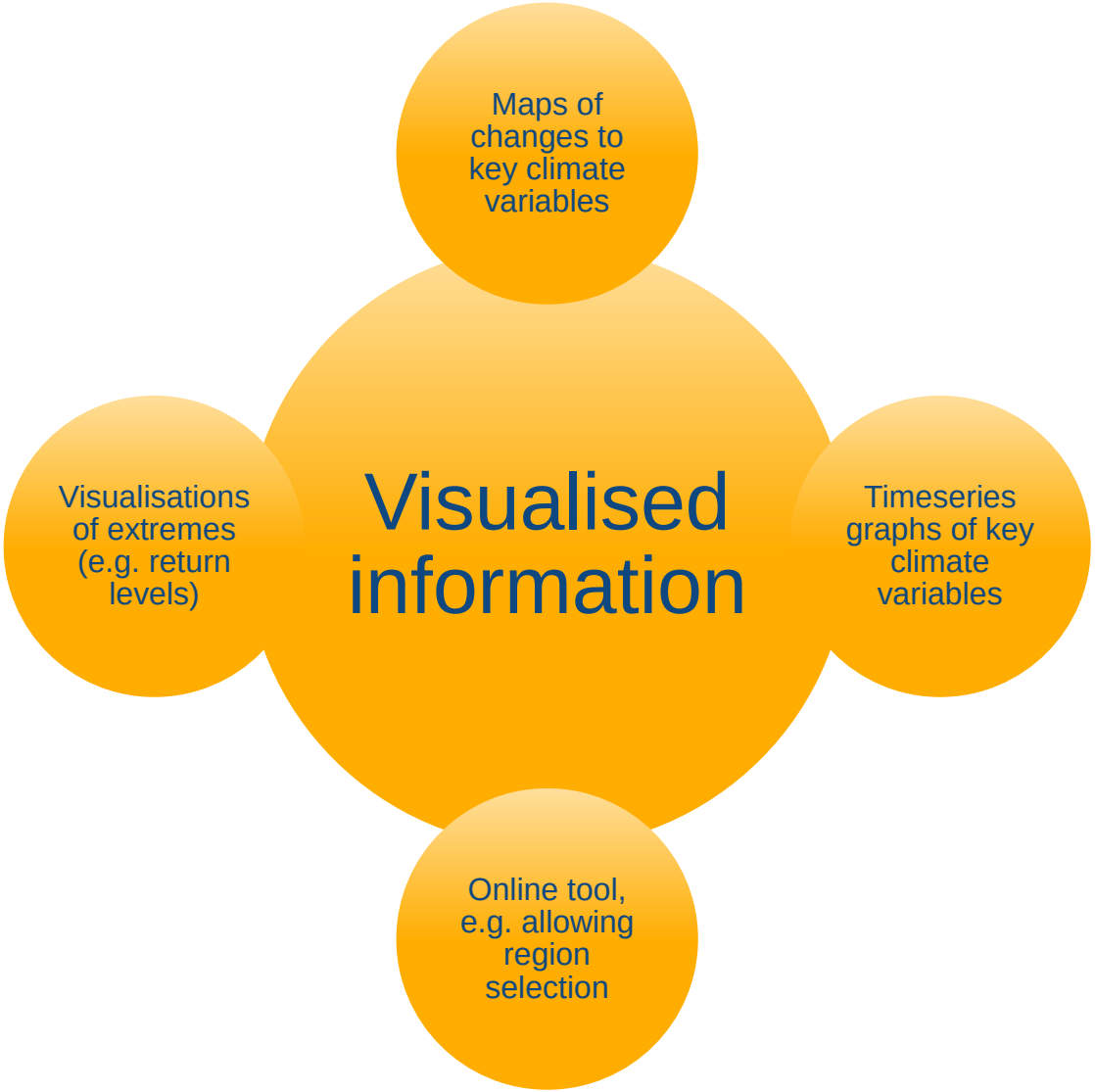

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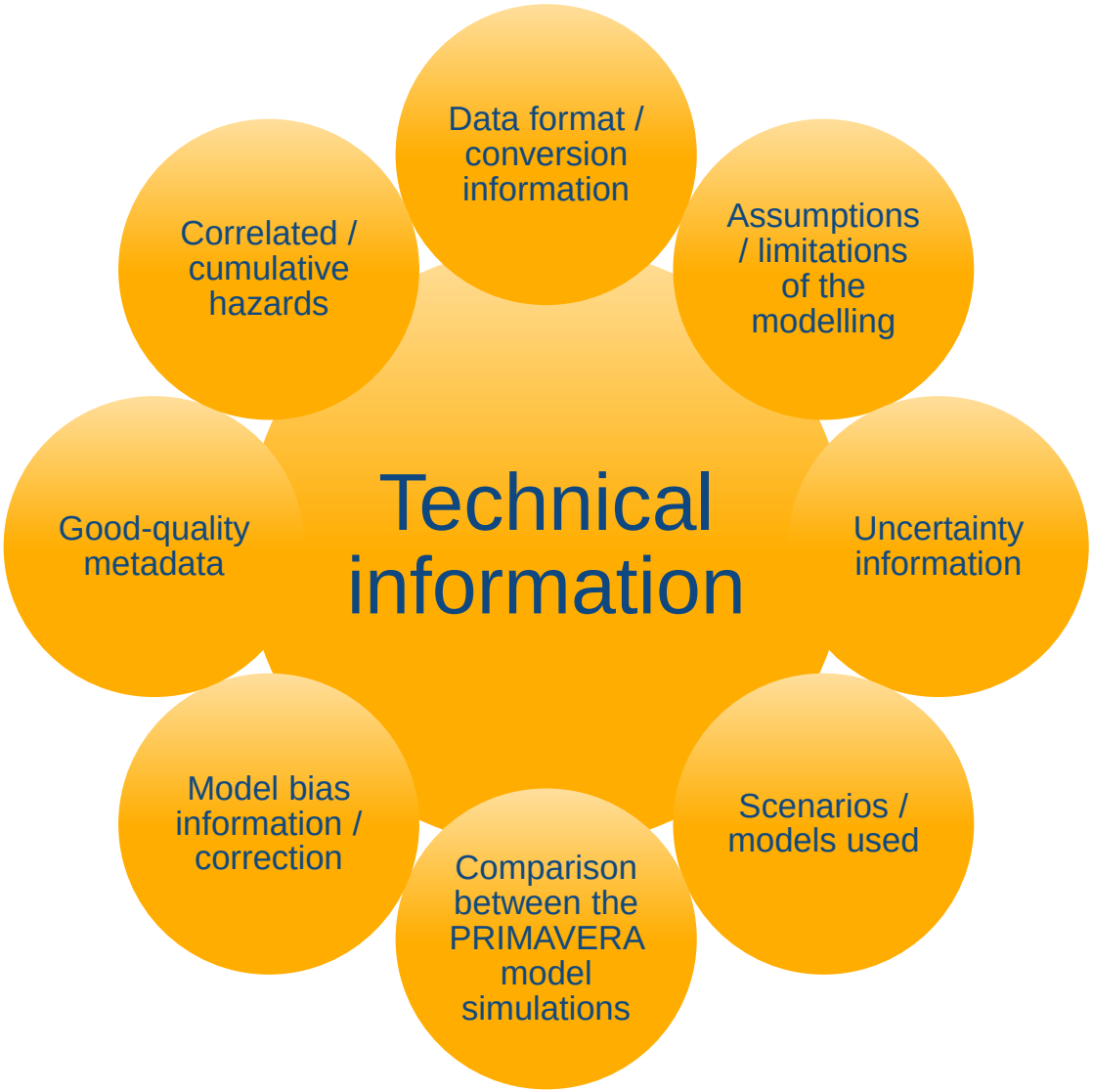

WHAT PRODUCTS / OUTPUTS WOULD YOU LIKE FROM PRIMAVERA?

WHAT ELSE HAVE WE LEARNED?

Management of privacy issues (e.g. with survey platform)

Geographic bias in survey responses / engagement generally

Even stronger geographic bias among those agreeing to be interviewed

Management of data protection issues

WHERE NEXT?

PROPOSED NEXT STEPS – HOW YOU CAN HELP

- Attending **conferences** – sectoral and scientific
  - Any suggestions?
- More **factsheets**
  - Suggested from interviews
  - Uncertainty, model simulations, methodological descriptions, case studies and more
- **Virtual meetings** – by sector
  - More detailed view of user requirements
  - Feasibility of user “wish lists” - what can be achieved within the project
  - Feeding into Stream 2 simulations

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PRocess-based climate sIMulation: AdVances in high-resolution modelling and European climate Risk Assessment

Flooding impacts on the European transport system

Intense rainfall can cause direct significant and long lasting impacts on transport operations, due to flooding, while indirectly impacting transport safety and bringing damage to transport infrastructure. Submerged roads and railway tracks become unusable, towns become inaccessible, movement of people and goods becomes disrupted, and floods could even lead to human casualties.

Knowledge about projected future changes in extreme rainfall events and in factors contributing to the occurrence of floods is needed. Such knowledge, combined with better understanding of the transport sector's vulnerability to these events, will allow transport organizations to develop strategies to minimize the potential risks brought about by changes in the characteristics of flood events in the future.

What are flood events?

Flooding occurs when areas not normally submerged become inundated by surface runoff, overbank river flows or groundwater. Pluvial flooding may occur when intense convective precipitation falls in a short period of time, or when prolonged moderate to heavy precipitation falls due to a front being stalled over an area or due to the passage of several consecutive storms over time. During such precipitation events, the ground may become saturated and no longer able to absorb the falling rain which leads to heavy surface runoff reaching rivers and flooding the surrounding areas. This is especially disruptive in cities, where the ground is often covered by impermeable surfaces, that do not allow infiltration of the rain water. The city waste-water drainage systems may not be able to cope with the large amounts of falling rain. Rivers can also become overwhelmed by surface runoff and intense precipitation, and burst their banks (river flooding) contributing further to the extent and impacts of a flood event.

What conditions lead to flooding?

A range of different meteorological conditions can lead to heavy rainfall and flooding. Flood events can result from strong convection leading to intense rainfall; or when several successive low pressure systems affect an area over a prolonged period of time, bringing humid and unstable air. Sometimes a slow moving cyclone allows

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PROPOSED NEXT STEPS – HOW YOU CAN HELP

- Face to face **workshops**
  - Sectoral or thematic
  - Engaging interaction and collaboration between scientists and practitioners

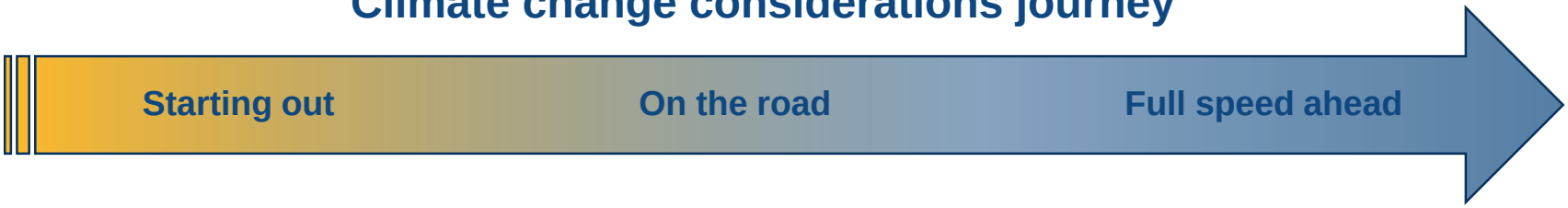
- **Use cases**
  - Focusing on tangible issues
  - Developed through collaborative and iterative process
  - Feeding from Stream 2 simulations

- PRIMAVERA **outreach**
  - Share your progress on weather mgt / CC adaptation
  - More people to contact?
  - Eastern Europe

USE CASES

- Expecting a variety of user questions

Climate change considerations journey



Future changes in **heat waves**

*Impacts of **extreme events** on the energy system*

Information to support **flood hazard** assessment

Impact of **heat waves and droughts** on crop production

Extreme precipitation

Construction of **wind storm** event sets

IN SUMMARY...

- **Lots of useful feedback gathered** from users so far – but plenty more to do
- Interesting **insights** into user requirements...examples:
  - Perceived importance – and meaning – of **"higher resolution"**
  - **Similarities** and **differences** between sectors
  - Variation in **user knowledge / experience** of climate data / information...
    - **Data-savvy (& data-hungry!)**
    - **Informed / interested, but aware of (some of) the issues**
    - **Taking their first steps**

Just give me access to the [raw] data, I know what I want to do

Can you help me to understand more about uncertainties in the modelling?

We're only just looking at adaptation now, and I'm not sure where to start

...more thinking to do about how to cater for **different needs**

- The real **"co-design"** part of PRIMAVERA (Stream 2) is yet to come!

THANK YOU!

QUESTION AND DISCUSSION SESSION

✉ primavera_inquiries@bsc.es