



Strategies & adaptation to a changing climate

Host

Maria Bartsch

Svenska kraftnät

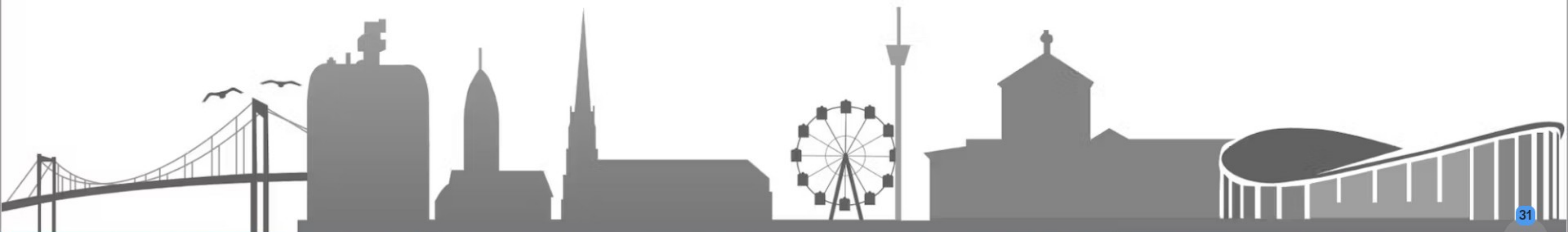
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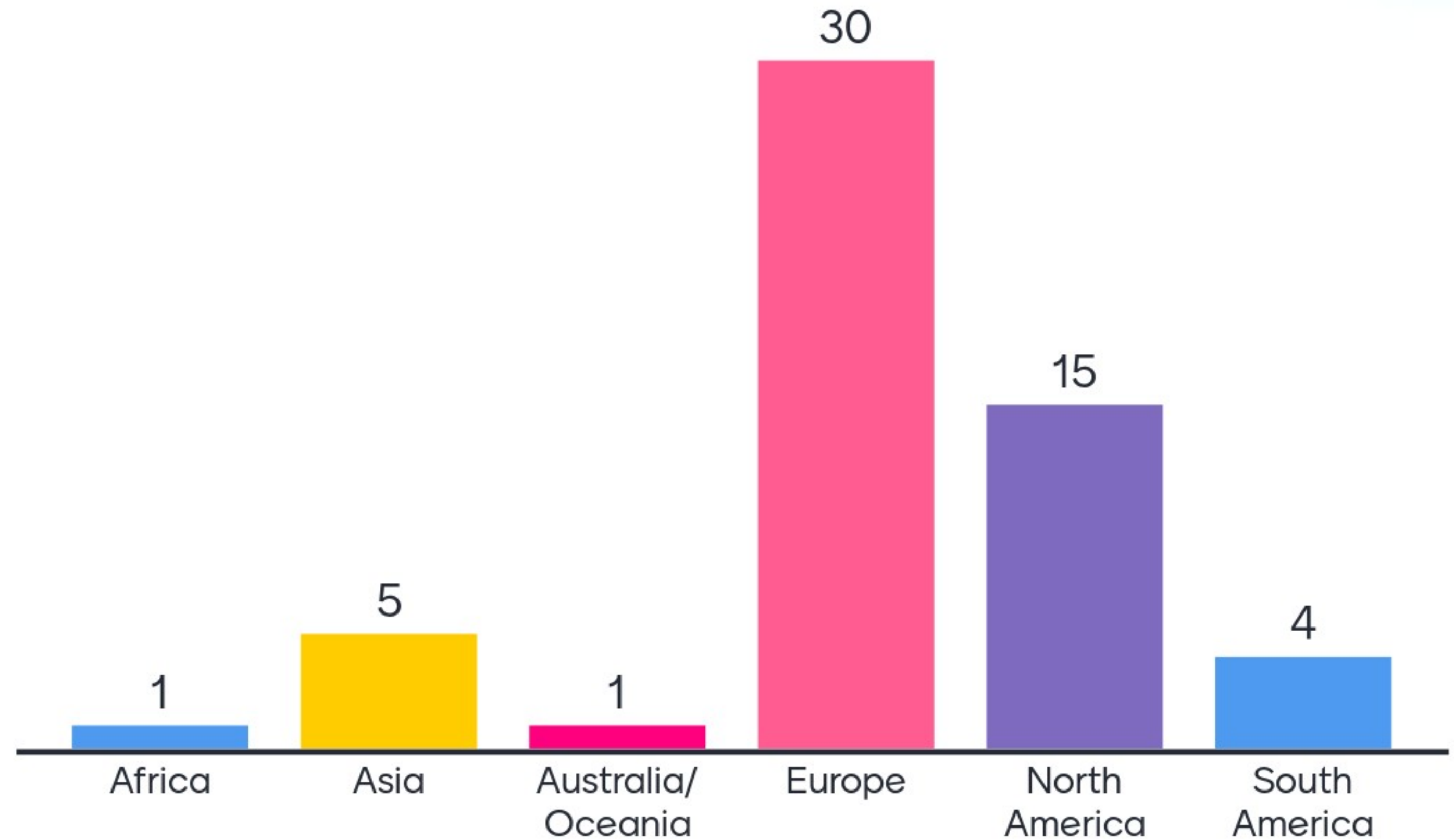




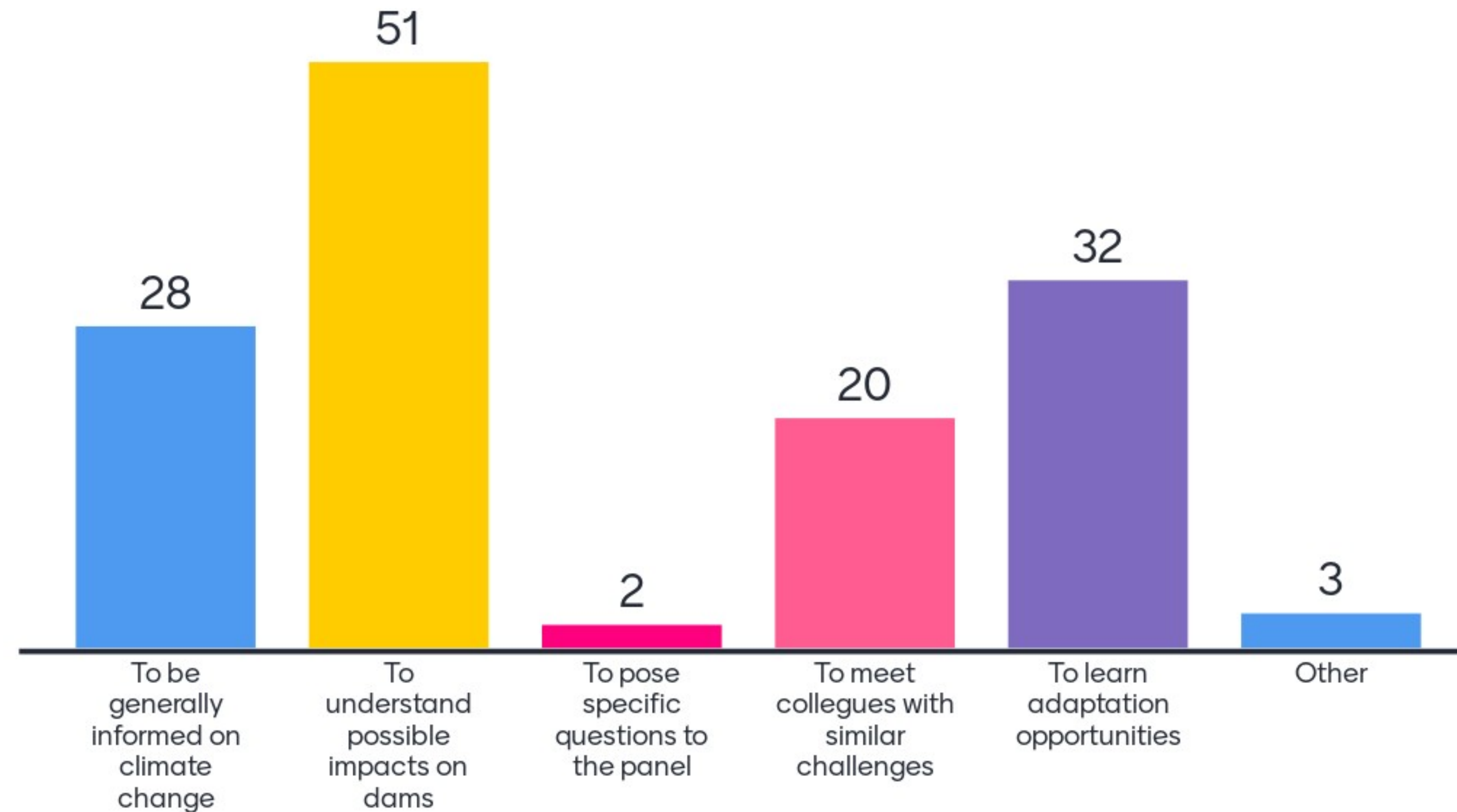
Welcome

- Svenska kraftnät – the Swedish Power Grid & Central Dam Safety Authority – Welcomes You by Maria Bartsch!
- Climate Change will affect all of us !
- This Workshop is an Opportunity to learn from each other !
- First Menti Questions ...

Which continent are You from ?



Why are You attending this workshop ?





Workshop program

Lectures 25-30 min incl. clarifying questions

Time	Topic
13:00	Welcome + Menti
13:05	Introduction + Menti
13:20	Dams and adaptation to climate change: Opportunities and challenges + Menti
13:50	Climate Change Scenario in India and Its Impact on Water Security
15.15	Overview on strategies and adaption to climate change in North America
15.45	Strategies on adaptation and resilience enhancement regarding Climate Change
16.15	Discussion & Conclusions
16.55	Closing

Coffee – 30 min



Presenter



Markus Möller

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Workshop 7 – Strategies & Adaptation to a Changing Climate

Technical session and panel discussion on dam safety in a changing climate.

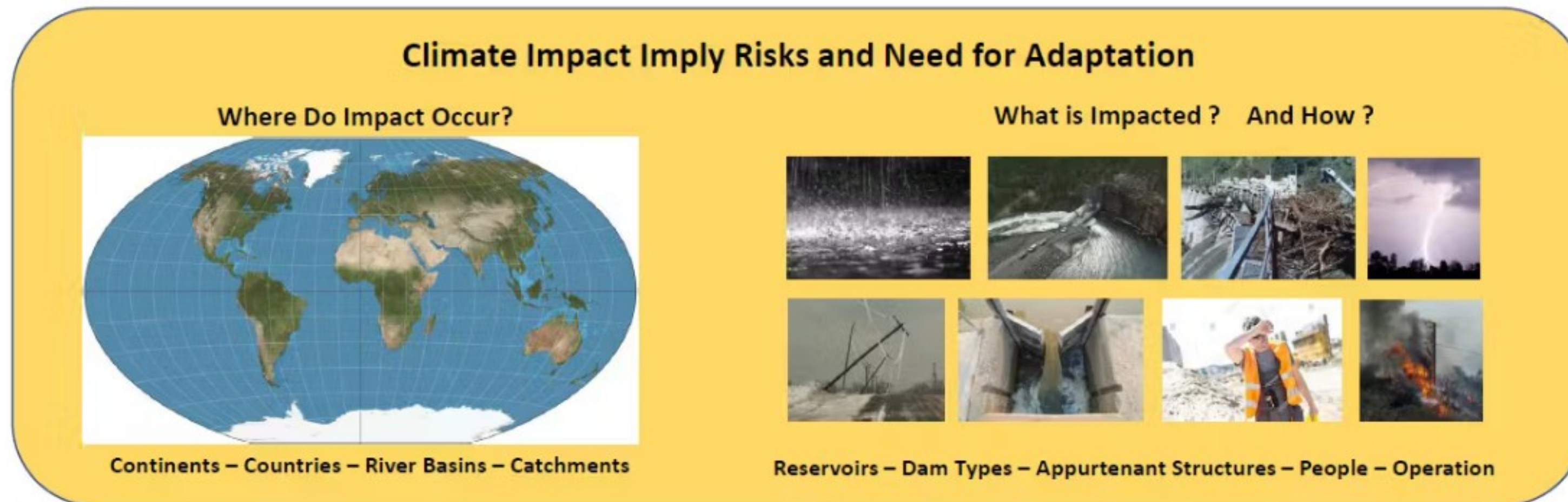
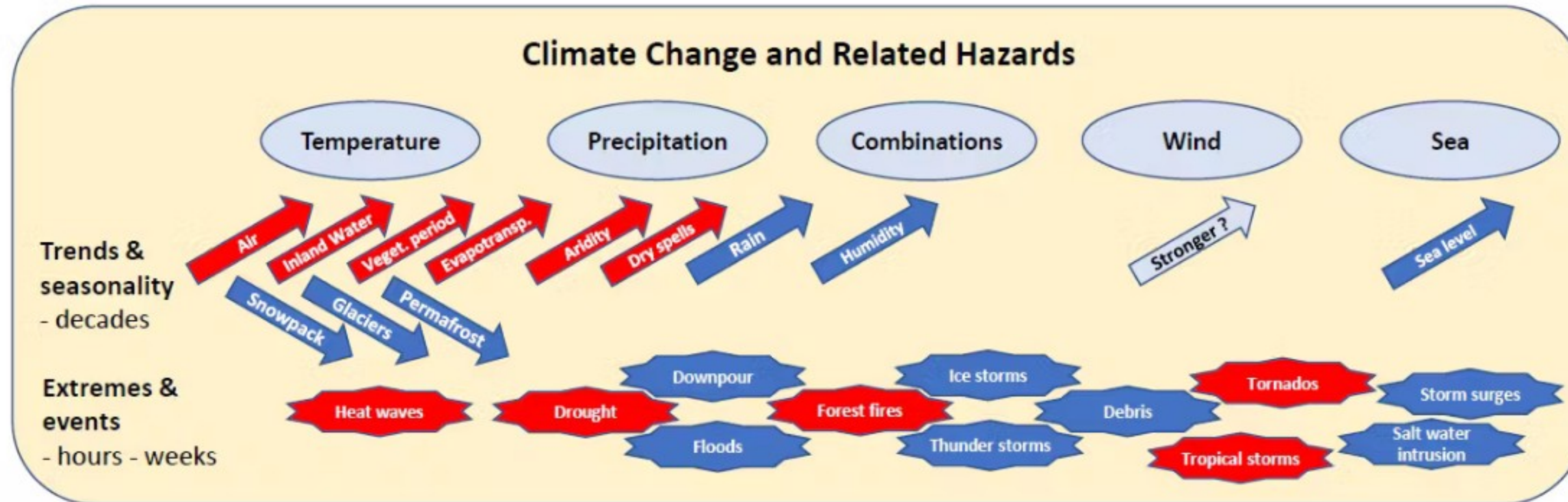
The workshop will include sharing experiences and practices regarding the adaptation of dams to changes in magnitude, frequency, and seasonality of natural loads and related hazards such as floods, storms, ice, heat waves, landslides, and forest fires.

The topics include:

- Climate impacts and risks
- Adaptation through operation and preparedness planning.
- Adaptation through design and upgrading
- Strategies, guidelines, and regulations for a changing climate.

This is an interactive workshop coordinated by Svenska kraftnät, intended for dam owners, consultants, researchers, and authorities involved in climate adaptation work & dam safety.



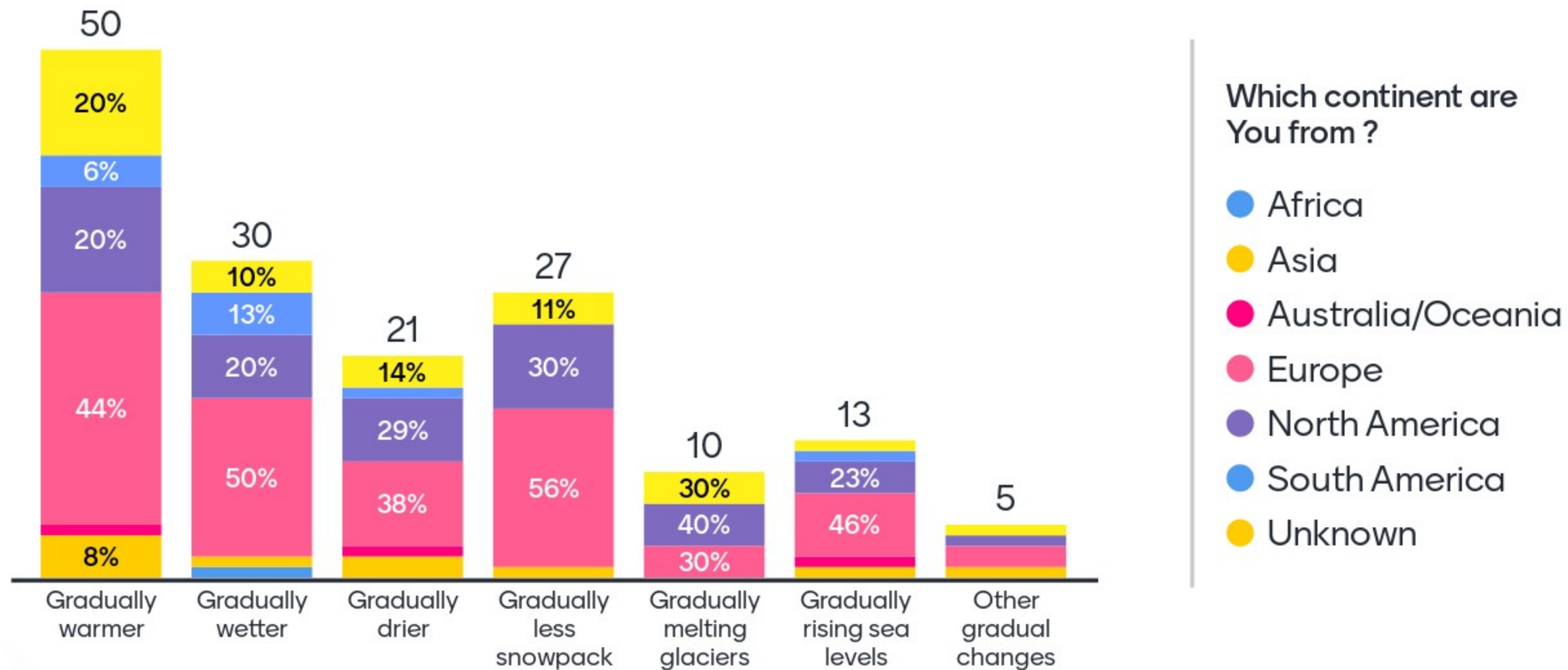


Strategies

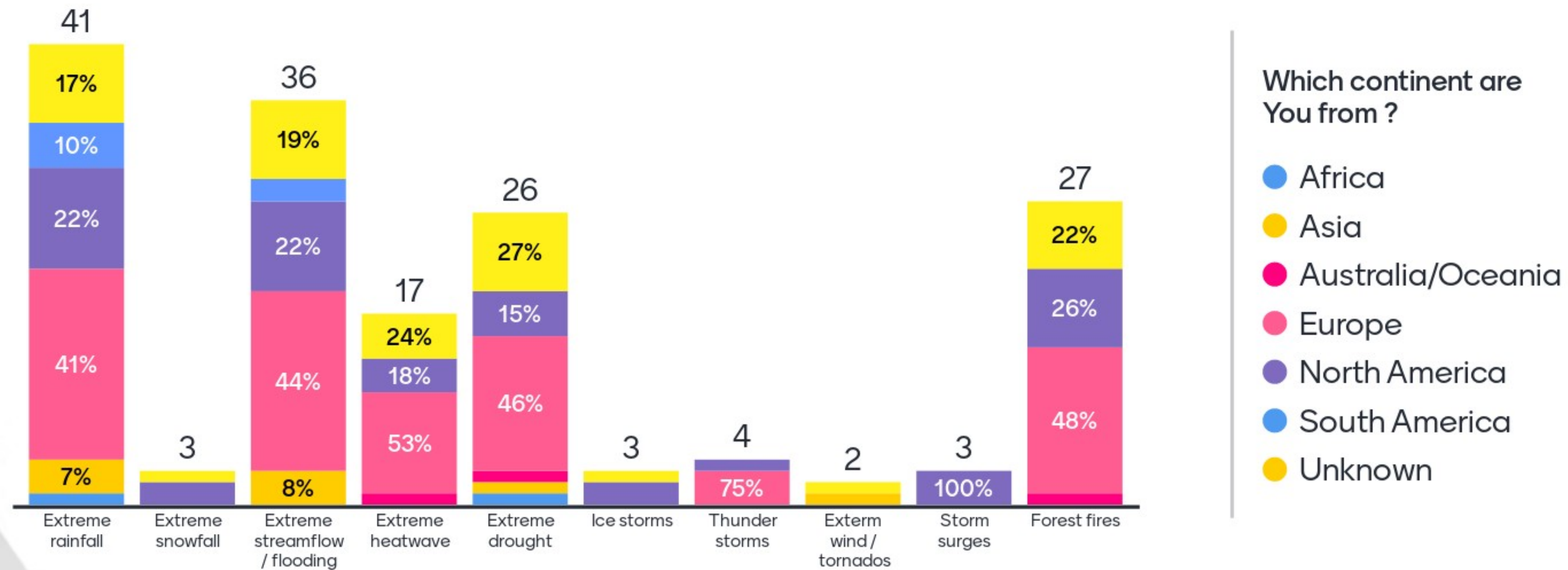
- Monitor**
- Fix**
- Maintain & Repair**
- Change operation**
- Upgrade**
- Combine / Schedule**



What would be the most important GRADUAL climate change impact in Your country ?



What would be the most important EXTREME climate change impact in Your country ?

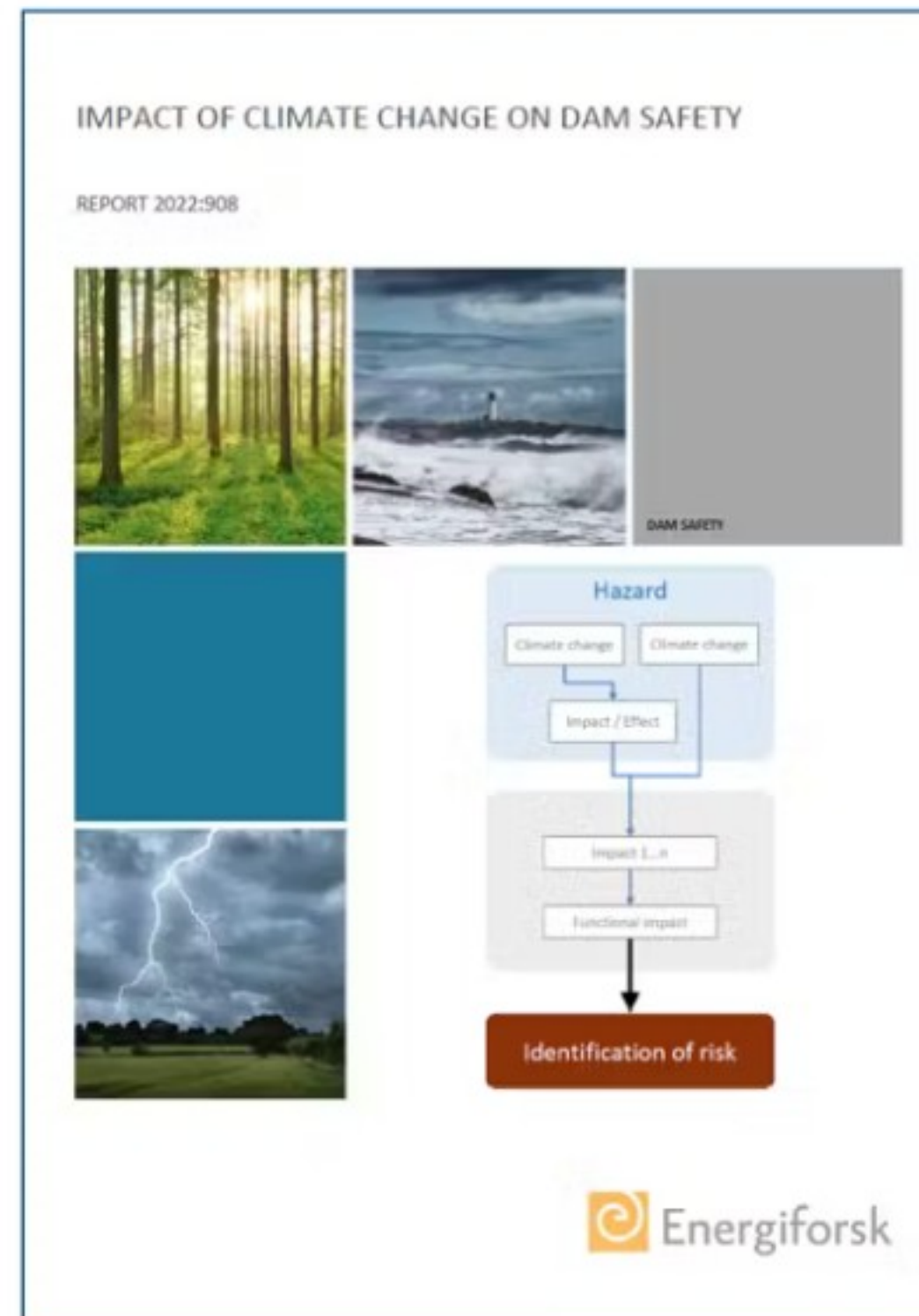




Present Work Approach regarding Climate Change & Dam Safety

- Design Flood Guidelines (1990 – 2007 – 2014 – 2022)
- Climate Committees (2011-2013 & 2021-2023)
- Not only a Design Flood issue ?
- Search for Methodologies and Strategies ...
- ICOLD Göteborg 2023 – SwedCOLD Workshop
- Climate Committee Workshop in August
- Wrapping it all up – end of 2023
- 2024 ...

Impact of Climate Change on Dam Safety | (energiforsk.se)



General guidance identified

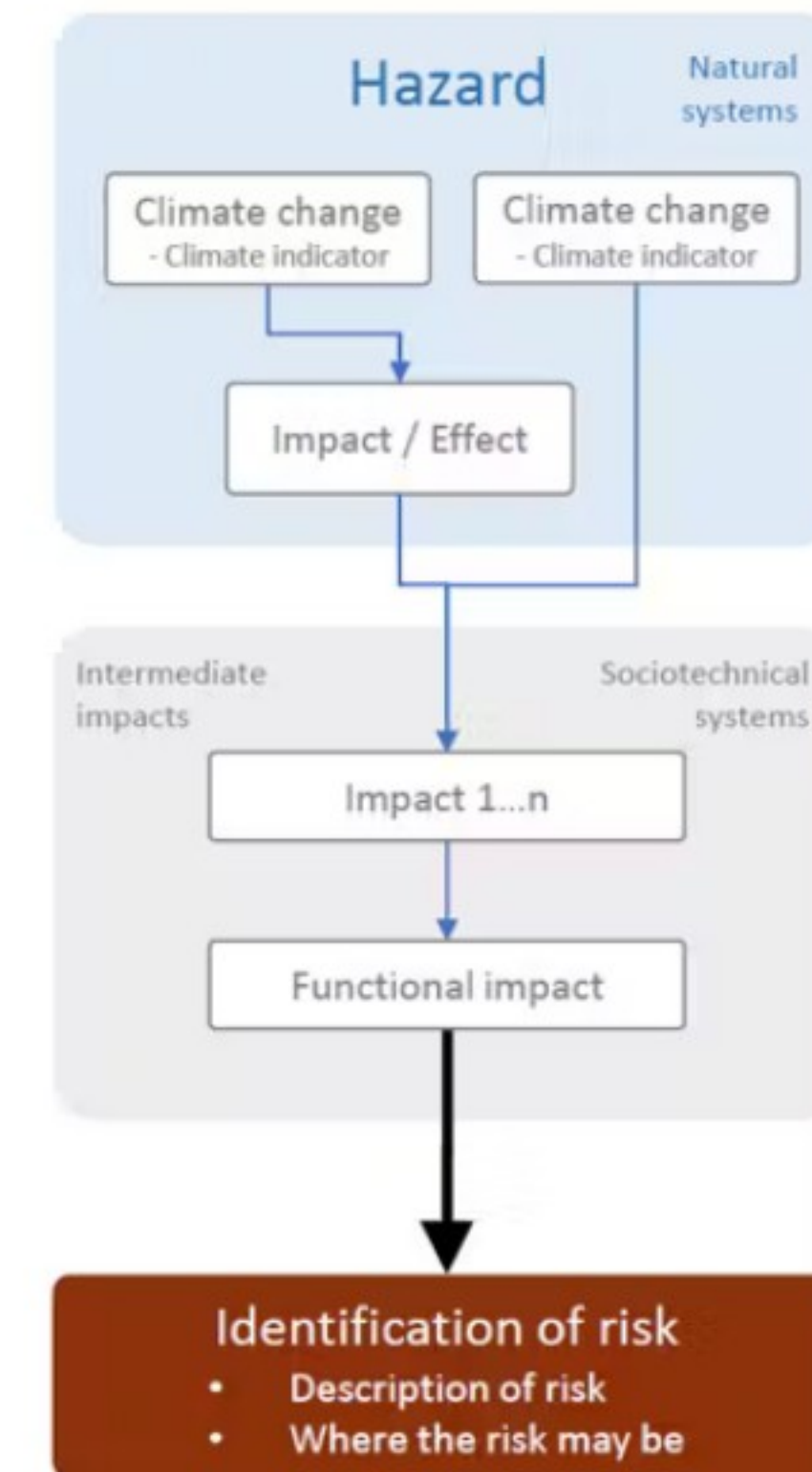
- UK – Guidance on Climate Change – Atkins, 2013
- IPCC – Climate Risk Framework – 2014
- ICOLD – Bulletin 169 on Climate Change – 2016
- GIZ & EURAC – Guide to Climate Risk Analysis – 2017
- IHA – Hydropower Resilience Guide – 2019
- CEA – Guide for Adaptation – 2020
- ISO – Standards for adaptation to Climate Change – 2019 & 2021
- Global Industry Standard on Tailings Management – 2020
- International Council on Mining and Metals ICMM – 2020 & 2021
- Etc.

<https://energiforsk.se/program/dammsakerhet/rapporter/impact-of-climate-change-on-dam-safety/>

Impact of Climate Change on Dam Safety | (energiforsk.se)

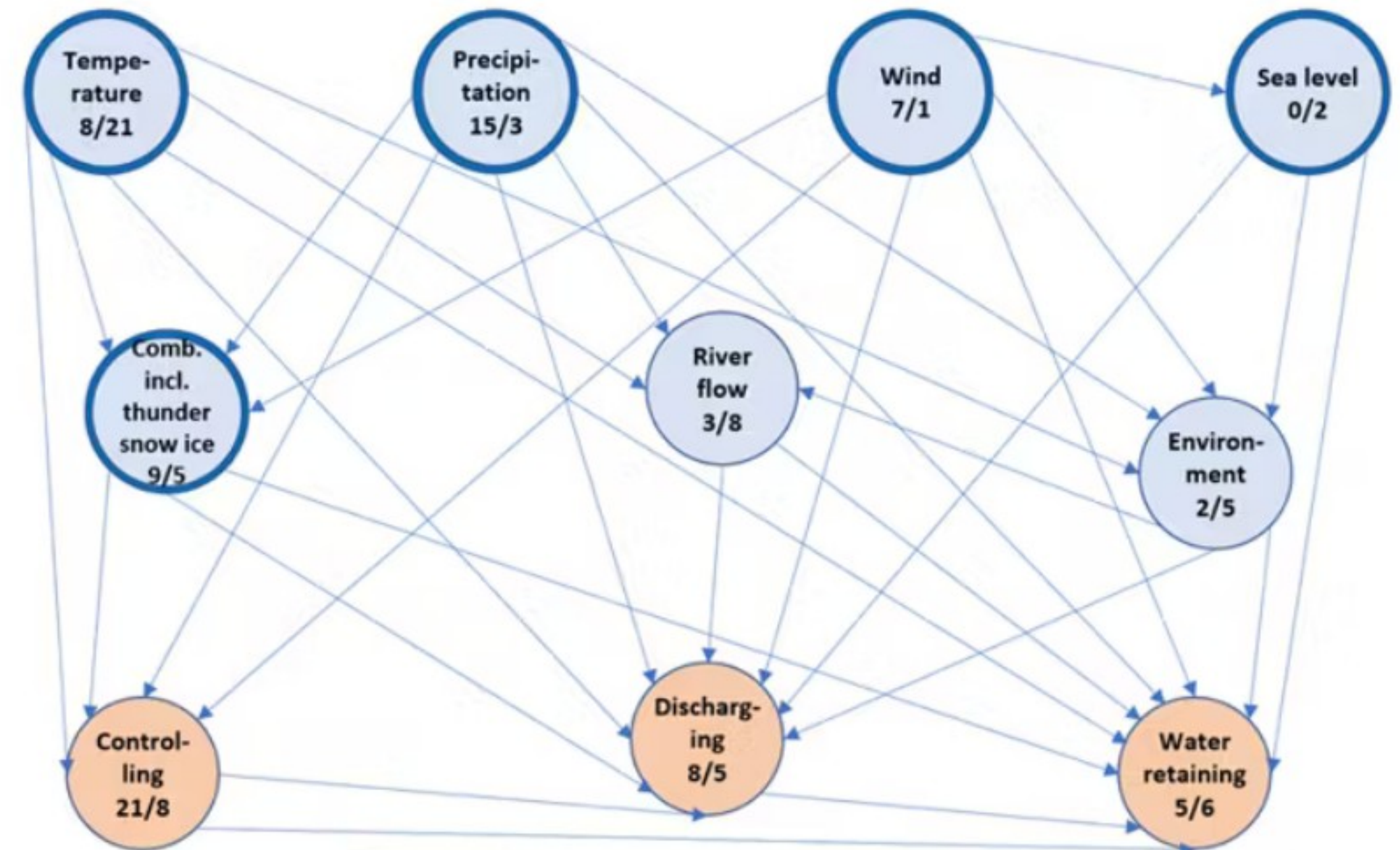
70 impact chains identified

- **Outside world**
 - change in the operating environment, that may affect dam safety
- **River flows**
 - impacts on flow conditions in watercourses, that may affect dam safety
- **Controlling function**
 - can lead to poorer reliability in the discharging or water retaining function
- **Discharging function**
 - climate changes that may affect the need for discharge or have a direct technological impact on the discharge function
- **Water retaining function**
 - climate changes that may affect the water retaining function



Conclusions

- **Climate change** in terms of dam safety is appropriately considered as **risks**.
- In the first instance, it is **already known risks** that may be exacerbated by climate change that are relevant for dam safety.
- **Impact chains** are considered valuable for identifying risks related to dam safety in **initial and general analyses** of climate change.
- With regard to the risk of extreme flows, the developed **modelling methodology** in the Swedish design flood guidelines provides a **better basis** than presented impact chains for analyses of changes due to the climate.





End of Introduction





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Items for discussion

Hazards &
impacts

Methodologies
& strategies

Adaption &
opportunities

Future &
co-operation

Three Statements & Your Opinions

