



# Conclusions from the Interactive Sessions

This research has received funding from the European Union Seventh Framework Programme under grant agreement no 606799. The information and views set out in this presentation are those of the author(s) and do not necessarily reflect the official opinion of the European Union.



# What do Extreme Weather Scenarios tell us?

## Paola Mercogliano, Kari Maki and Guido Rianna

- Objectives of the session:
- Providing insights into the concept of weather extremes
- Illustrating the use of methodology developed in INTACT
- Providing insights on extreme weather events and their EWIs in INTACT cases
- Assess the needs to include climate change and extreme weather in the risk framework for CI management
  
- General notes:
- About 40 people have participated to this session
- Thanks to this morning's speeches people attending to the session were already sensitized with respect to the session topic
- The people attending completed a questionnaire testing the expected variations in weather forcing and also the expected variations in EWE impact on CI according the single expertise
  - Results will be analysed afterwards
- INTACT Wiki was used by participants to access the weather scenarios on map
- Participants sought for information to check their initial assumptions on extreme weather changes in their own country
- Some suggestions were made for more analysis to improve the accuracy of results in Wiki

# How vulnerable is your infrastructure?

## Marco Uzielli

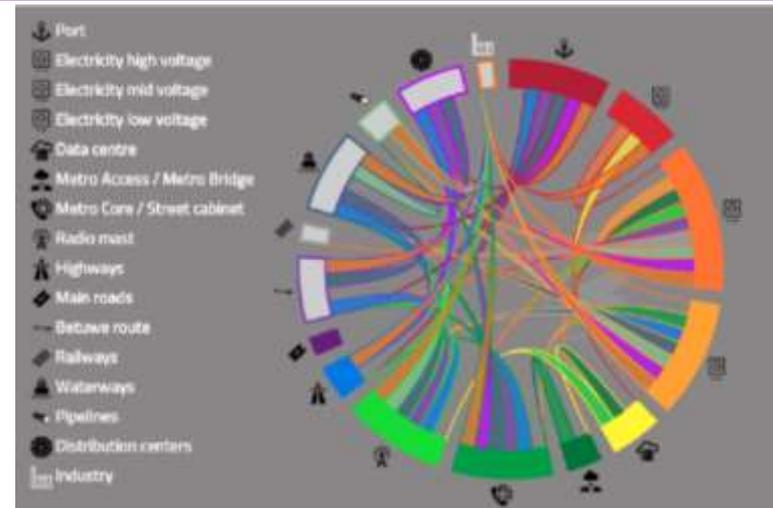
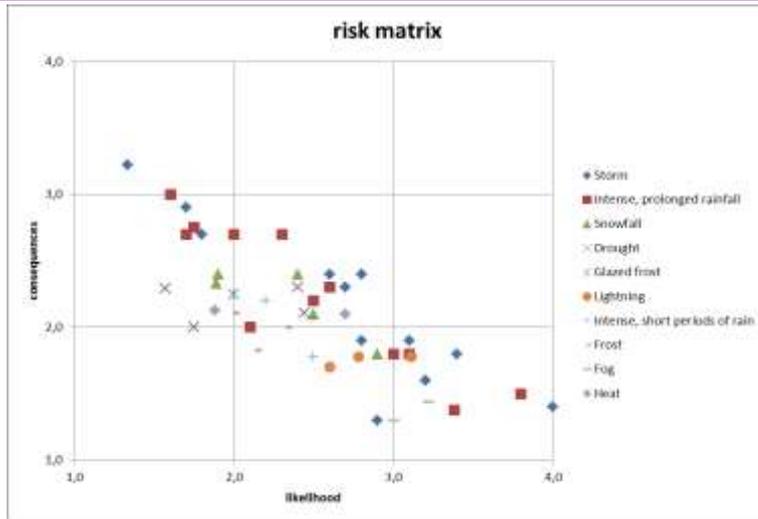
### First Session

- Lots of questions about the probabilistic approach
- How uncertainty can be modelled reliably?
- How can intensity be modelled probabilistically?
- What is the present-day diffusion of probabilistic networks in risk estimation for CI's to EWE?

### Second Session

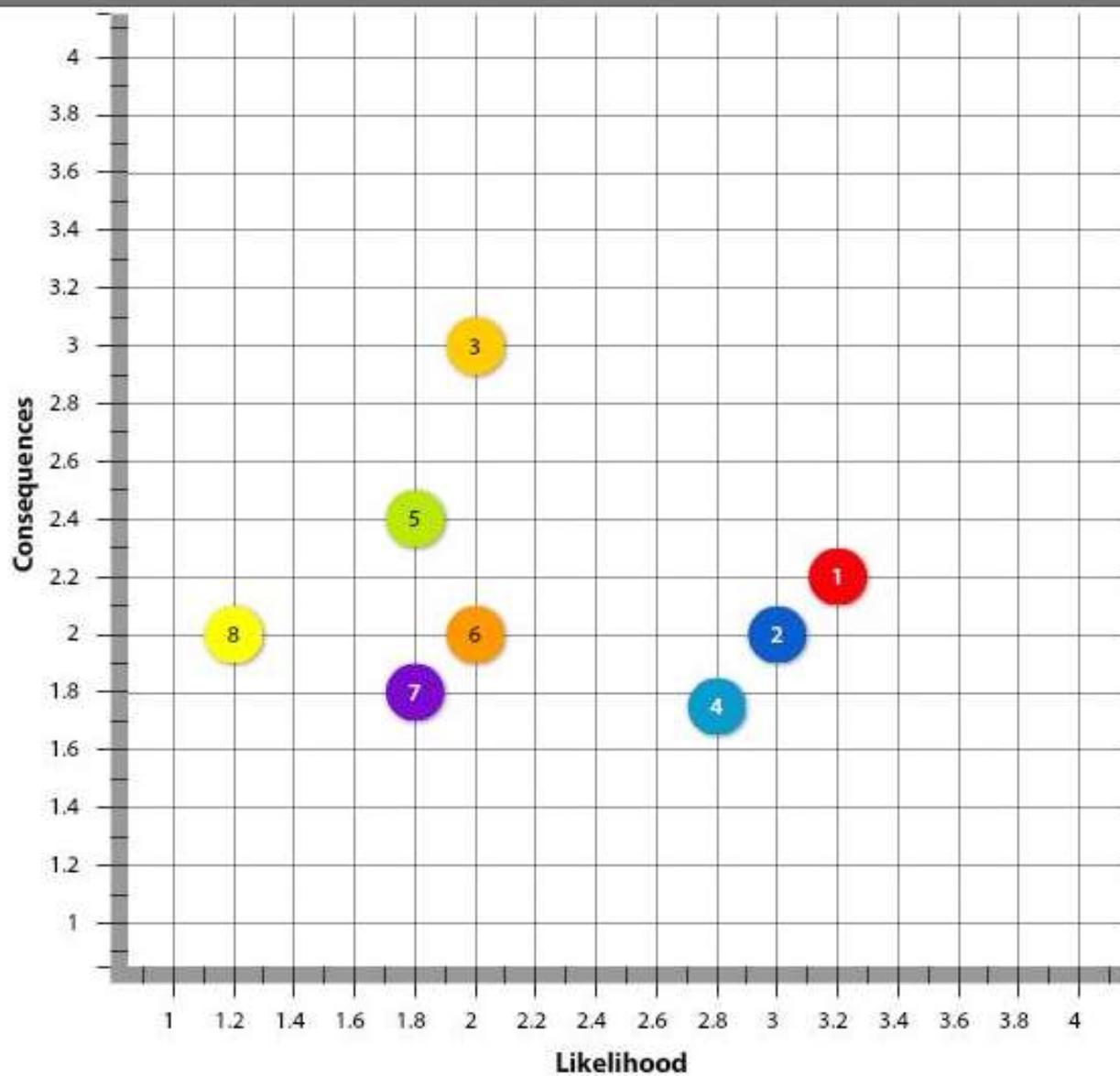
- No questions

# Risk assessment – Cascading effects

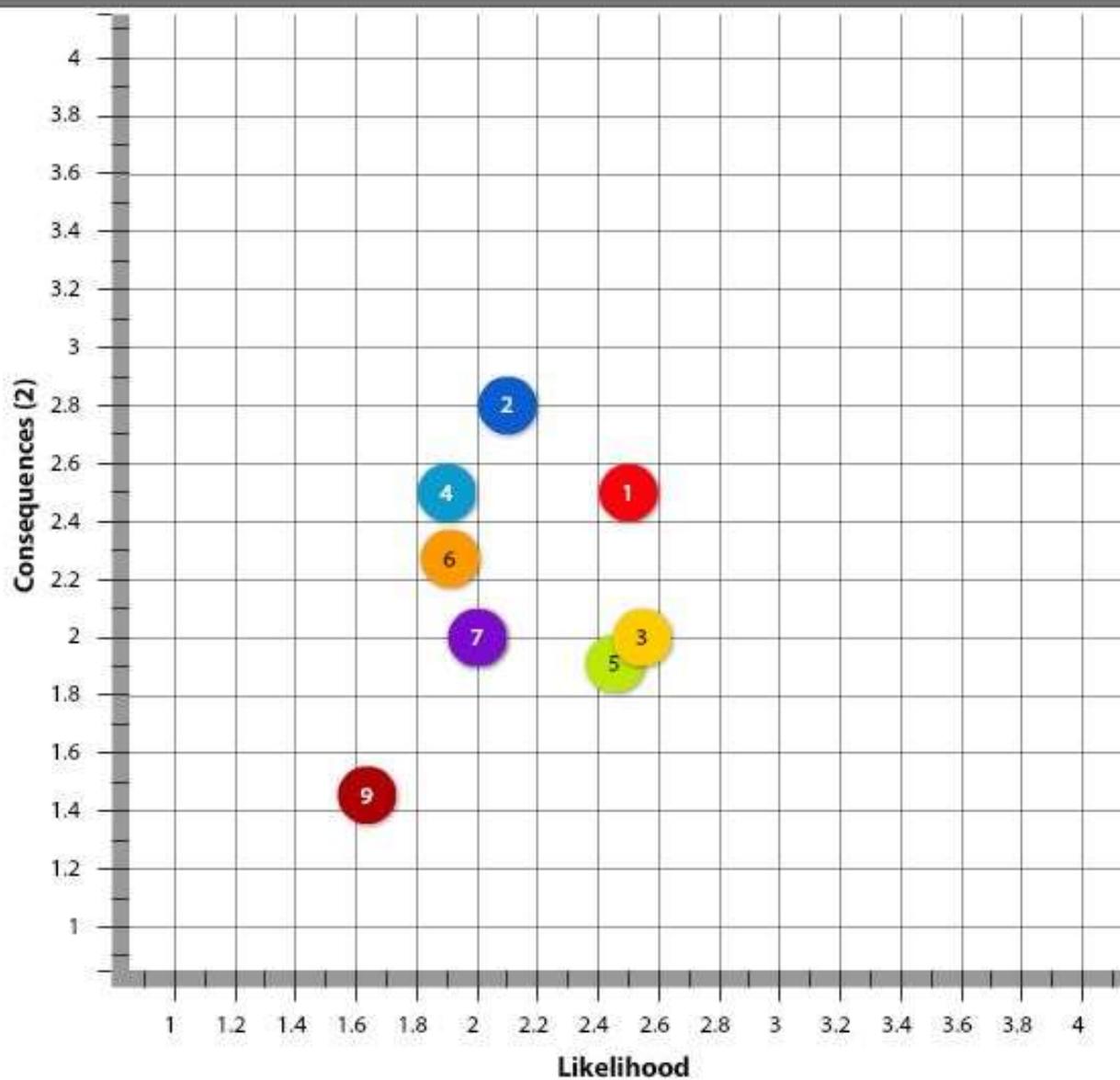


# Objectives of a collaborative risk assessment

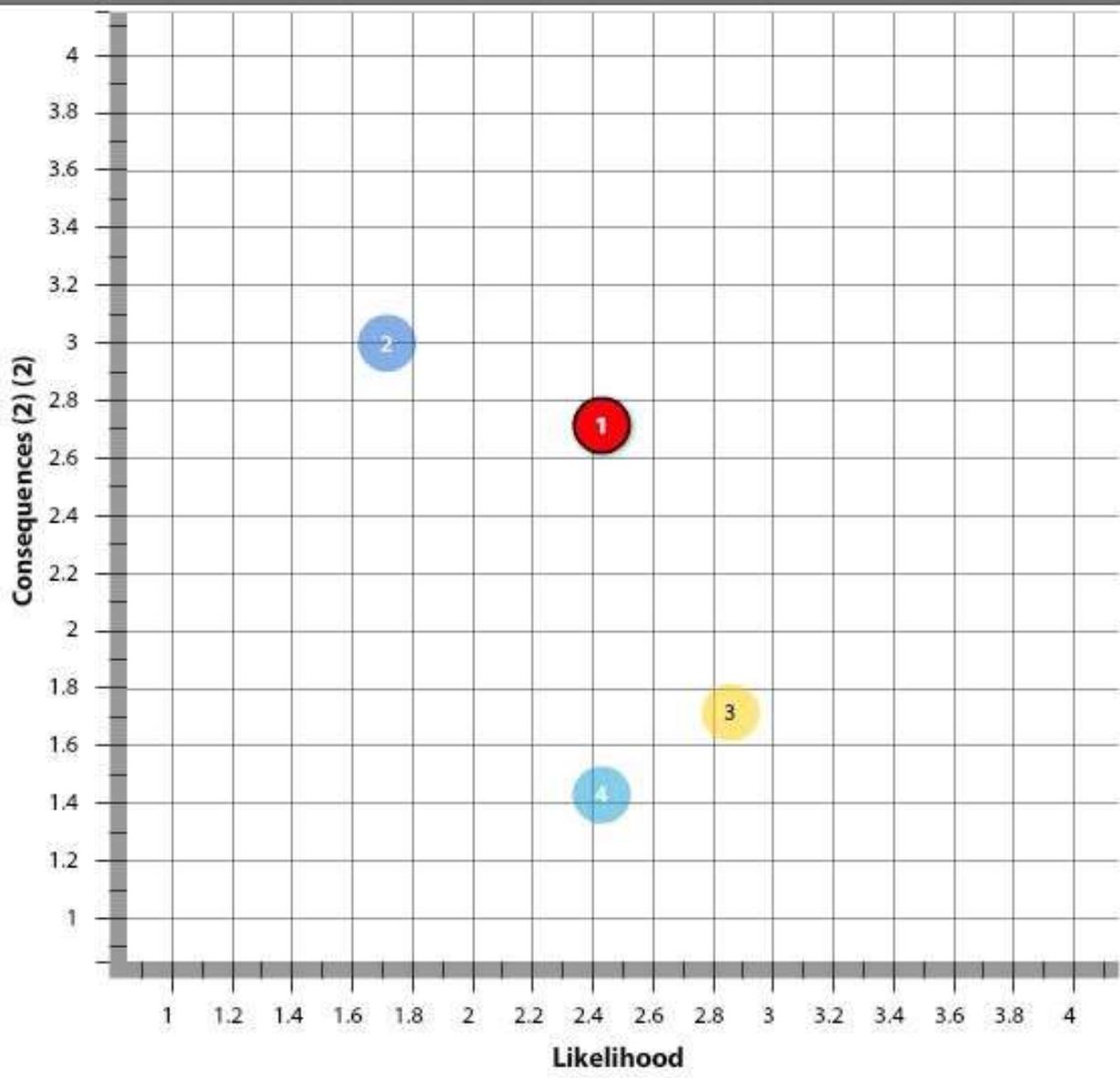
- To raise awareness and common understanding
  - Extreme weather effects
  - Climate change
  - Dependency on critical infrastructures
  - Sharing of lessons learned
- To get input about impact of failure of critical infrastructures for the end users and CI operators
- Build on end users' own experiences to get results that are fit for purpose
- Scoping



- 1 heavy rainfall > delays in traffic> arrival to l...
- 2 bus is full
- 3 failure in the power supply to the railway
- 4 missing the connecting train
- 5 Snowstorm, Bft 11 and heavy snow varyin...
- 6 Storm
- 7 hailstorm
- 8 personal injury



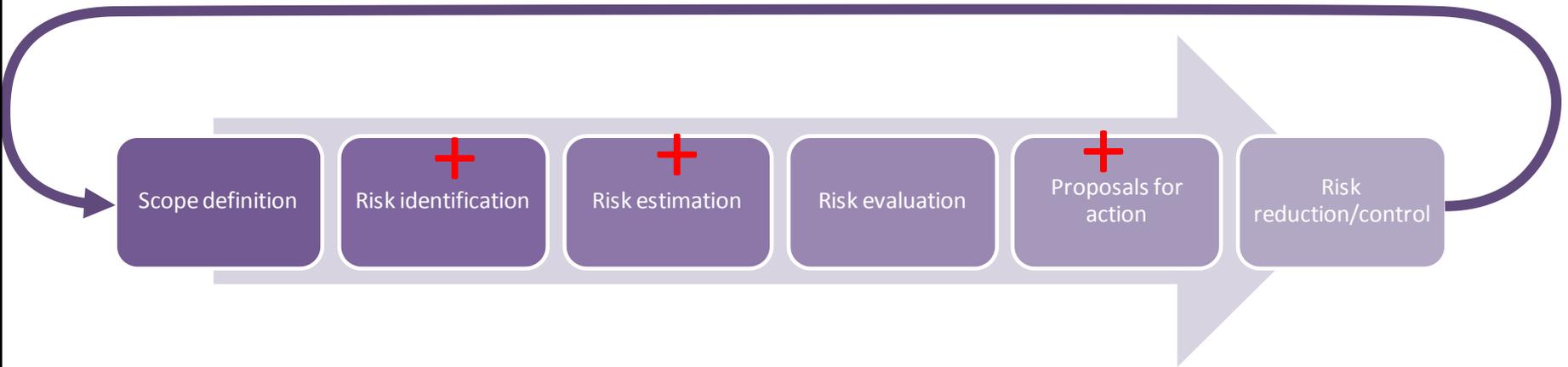
- 1 extreme storm, take car in stead of bicycle,...
- 2 Extreme rainfall event combined with bloc...
- 3 Heavy snow, bike roads are not safe to use
- 4 Ice rain - driving becomes difficult, traffic j...
- 5 extreme rainfall - lead to road blockages
- 6 Winter Snow Storm - flight from Montreal i...
- 7 large amount of snow -> increased travelli...
- 8 snowstorm leads to disruptions of NS rail...
- 9 extrme frost



- 1 Heavy rain-delay of flight-impossible to at...
- 2 Hail storm that crashes windows
- 3 Heavy wind - flights delays - late arrival to ...
- 4 Cold spell (hazard)- changed train schedul...

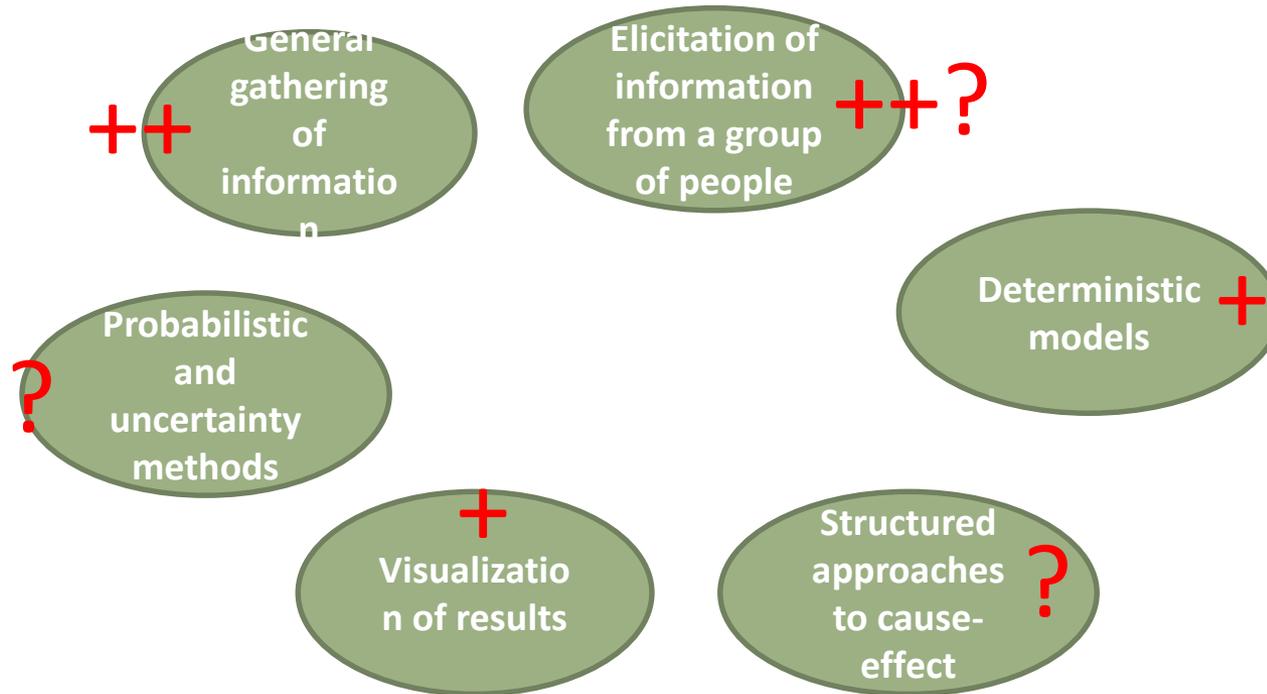
# Conclusions - Use of wiki

## Andy Tagg & Albert Nieuwenhuis



- Steps familiar
- Often used

# Conclusions - Use of wiki (2)



# Beyond INTACT - Billy Hynes and Jan Kiel

## Question 1

- How would you use the INTACT wiki, the data and methods in your work?
- How useful are the results for your work?

### Answers

- Wiki methods very useful
- Can cross-link wiki to UNISDR Scorecard, the Sendai Framework for Disaster Risk Reduction
- Consider links to Rockefeller 100 Resilient Cities, insurance organisations
- Clear linkages with Wiki and the National Roads Authority for the Netherlands projects
- Need another page on Wiki showing/explaining linkages to existing and developing frameworks
- Consider "Vital Infrastructure" definition
- Consider "rapid risk assessment" process within Wiki for fast risk assessment
- Make the data available within the Wiki more explicit
- Consider renaming the "Wiki" to potentially "Resilience Climate Inquiry Framework/System" or "Innovation for Climate Resilience", or "Climate Adaptation Framework" or "A Stress Test Tool for Climate Adaptation"
- Could be test on existing and future projects
- Could be beneficial for use by the EIB, particularly the Circle Tool
- Wiki very beneficial for presenting an overview of many issues, actors involved, complexities involved
- Consider a custom pilot application of the Wiki

# Question 2

- What benefits do the INTACT outcomes offer for your region?
- At what scale can the results be used best? Local, national, international, world-wide?

## Answers

- Think of the application of INTACT as a top-down bottom-up process – and apply this rational to the spatial application
- Key issue is the availability, application, use of data

# Question 3

- The platform is built for generic purposes. The advantage is that it can be used for any CI sector. The drawback is that it is not tailor made.
- How do you see this? Do the advantages outweigh the disadvantages? What would be needed extra?

## Answers

- Depends on usage – if Wiki is seen as a reference guide then it is appropriate to have it at a generic level
- Depends on the search engine capability of the Wiki
- Generic is more appropriate than tailor made, particularly when trying to understand the cascading effects

# Question 4

- The INTACT wiki is currently hosted by the consortium. What is your opinion on this?
  - Does the EC need to host it?
  - Does industry need to host it?
  - Some other party?

## Answers

- Should be hosted independently – potentially EC, Community of Users, EU weather institutes,
- Needs to be controlled, patrolled by, for example, UNISDR

# Question 5

- The INTACT wiki is a platform that needs to be further filled in the future. We will aim to do so, but are there any ideas from your side concerning future expansion of the wiki?
  - Regular update?
  - Validation of update?
  - More information to be added?
  - Organisation?

## Answers

- Regularly updated by communities dealing with EWE and Cis
- Validation controlled through a peer-review protocol

# Question 6

- We identified different customer segments:
  - Education/Academia
  - Policy Makers
  - Risk Management
  - Critical Infrastructure Operators
  - Regional Authorities
  - Municipalities
  - Consultancy
  - Emergency Service Providers
  - Training Providers
- Which segments are most important / least important?
- Do we miss any?

## Answers

- Key segment is Consultancy, as they have to put it to the end-users, and also as other segments may not explore in detail all the many issues, factors, etc., under consideration
- Also, Emergency Service Providers very important segment
- Users of the CI not an important segment

# Question 7

- We see the following value proposition:
  - Problem Solving
  - Awareness Raising
  - Information Availability
  - Risk Reduction/Management
  - Knowledge Platform
  - Tools
  - Educational Material
  - Cost Reduction
  - Linkages with other EU Research Projects
- Which propositions are most important / least important?
- What else?

## Answers

- Knowledge Platform and Tools most value propositions
- Also, linkages to global research important
- In additional. “Long-Term Comprehensive Interventions” proposition

# Question 8

- What gaps do you see in the knowledge?
- What suggestions do you have for further research?

## Answers

- Ongoing and dynamic cascading effects and aspects, and the continuous changing environment and society

# CI - Learning & Teaching

Thursday March 23<sup>rd</sup>

Prof Jorn Birkman & Dr Michael McCord

- Clear need for different disciplines to understand vulnerability, risk, impact and resilience factors of Critical Infrastructure (CI) to Extreme Weather Events (EWE)
- The 'Need' for future employees → CI failure should be an integrated part of teaching at universities
- CIs are socio-technical systems → resilience is not only a matter of technical assessments but also of the involvement of different actors and their cooperation
- Multi-actor co-operation: Importance of linking different disciplines – in particular engineering, social science, ...
- Clearly a 'space' for multi-disciplinary education and CPD practice using the **INTACT VLE ecosystem**

