

Who will benefit from this work?

- Public sector and community citizens, for better preparedness, information enhancement and awareness
- Operators of (Smart) CIs who offer their services based on (more) resilient structures
- Industry and SMEs who offer products or services to the SCI operators that increase their resilience, or solve issues of interdependencies and cascading effects
- Researchers and professionals, both from industry and the academic world



Consortium



Coordinator: Aleksandar Jovanovic EU-VRI
Tel: +49 711 410041 29

Project Manager: Bastien Caillard EU-VRI
European Virtual Institute for Integrated Risk Management
Haus der Wirtschaft, Willi-Bleicher-Straße 19, 70174 Stuttgart

Contact: smartResilience-CORE@eu-vri.eu

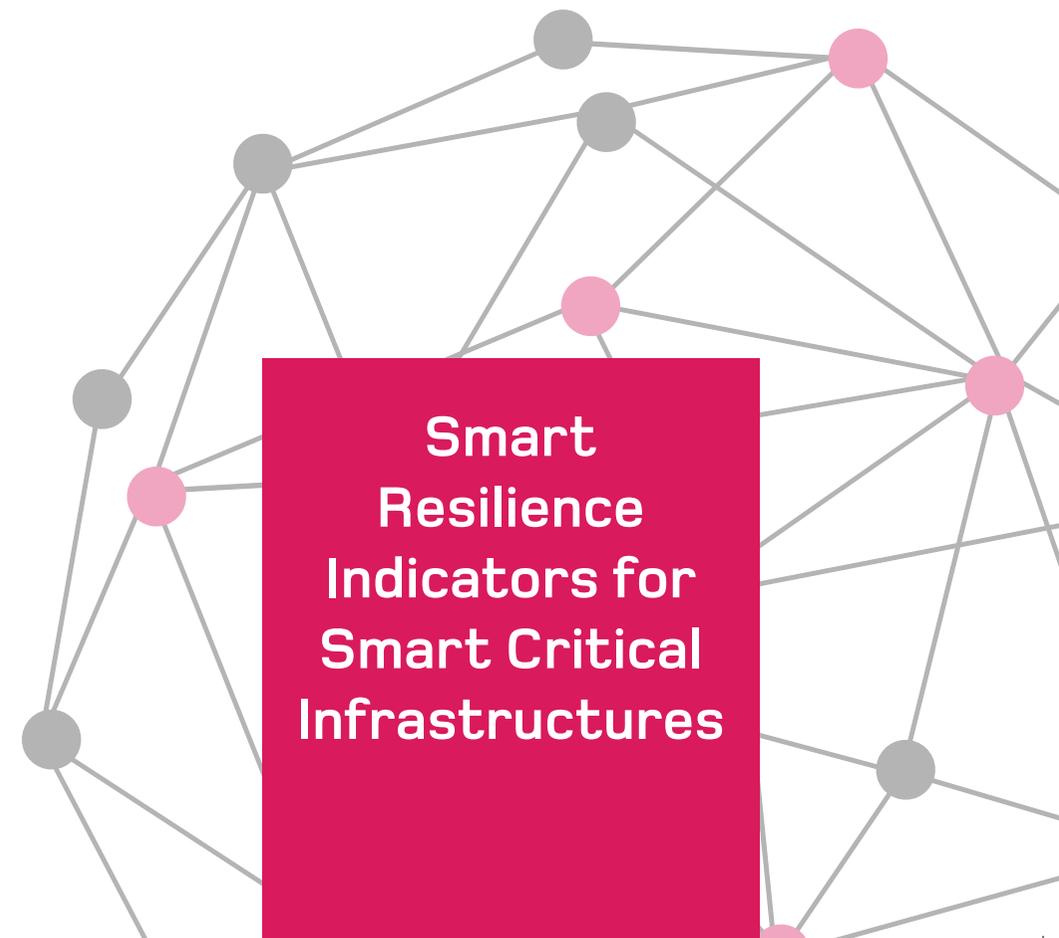
Twitter: @SmartResilience
LinkedIn: SmartResilience Group
Website: www.smartresilience.eu-vri.eu



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Is resilience simply a vacuous buzzword, or is it a concept with substance that can provide insight into the impact and recovery from a disaster? Can resilience be quantified?

Adam Rose "Macroeconomic Impacts of Catastrophic Events: The Influence of Resilience"



Challenges

Modern Critical Infrastructures (CIs) are becoming more complex and interdependent, but “smarter” in normal operation and use.

However:

- Will these be “smartly resilient” when exposed to extreme threats, such as extreme weather disasters or terrorist attacks?
- As “smarter” is more complex, will they be more vulnerable?
- How will they resiliently prepare for, respond, adapt and recover from extreme threats?

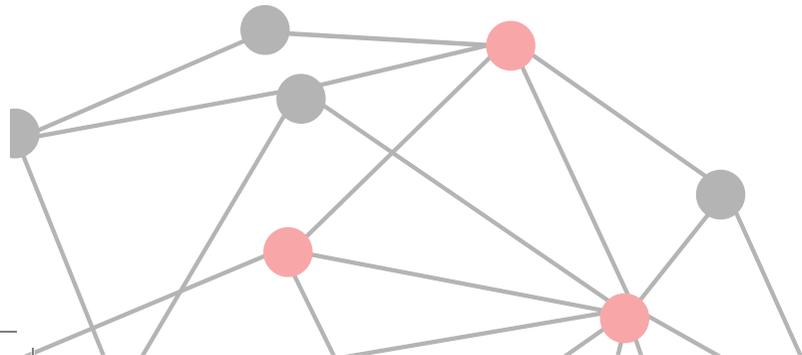
Objectives and approach

Resilience should be managed with approaches beyond conventional risk management, in order to address the complexities of large integrated systems and the uncertainty of future threats. Resilience in modern society is determined by its various and often interconnected infrastructures: energy supply, transportation, government, water, etc.

SmartResilience aims to provide an innovative “holistic” methodology for assessing resilience, based on indicators. Its specific objectives are:

- to identify existing indicators for assessing resilience of SCIs (Smart Critical Infrastructures)
- to define new “smart” resilience indicators (RIs) – including those from Big Data
- to develop an advanced resilience assessment methodology and tools
- to test and validate these methodologies and tools in 8 case studies in respective number of European cities. A virtual Europe-wide case study will be demonstrated, binding and bringing together the case studies, studying the cascading effects of “tainted” flood

The **holistic approach** of SmartResilience considers an integrated view on resilience assessment, addressing a broad variety of issues including human factors, security, sociology, economy etc., and increased vulnerability due to changing and/or emerging threats.



Case Studies

SCIs and their scenarios are key elements of the project, selected to demonstrate how the project tools and methodologies can be applied to various infrastructures located in 8 European countries. In addition, one integrative scenario covers the European landscape. This allows the combination of the different SCIs into the different scenarios which are illustrated below:

| Infrastructure (CI) / Scenarios | Case Studies | Terrorist attack | Cyber attack | Natural threats | CI-specific events |
|-------------------------------------|--------------------------------|------------------|--------------|-----------------|---|
| Smart cities | Germany, Sweden, Ireland | ✓ | ✓ | ✓ | Social unrest, urban floods, interruption of water supply |
| Smart finances | UK | (✓) | ✓ | | Cyber risks, climate risks |
| Smart health care | Austria | (✓) | ✓ | (✓) | Breach of privacy |
| Smart energy supply systems | Finland | | (✓) | ✓ | Interruption of fuel supply & district heating |
| Smart industrial / production plant | Serbia | (✓) | ✓ | (✓) | Industrial accidents' |
| Smart transportation | Hungary | ✓ | (✓) | | Disruption of airport services |
| Integrated Virtual Case Study | Combined scenarios in all SCIs | ✓ | ✓ | ✓ | Cascading effects |

✓ - yes, (✓) - partly

Expected Impacts

SmartResilience will significantly **improve the resilience of SCIs** by providing a comprehensive methodology of risk and resilience assessment. This assessment is expected to lead to **proactive innovations** that, eventually, will raise the level of resilience of the SCIs. In addition, a number of other impacts are expected:

- fostering new product development and solutions, generating new insights for SCIs and their interdependencies
- providing novel tools and insights for rapid response planning, improved business continuity and organizational adjustments to become more resilient
- enhancing resilience of the society as a whole, based on concepts of increased awareness, preparedness and appropriate behavior during disasters