Critical Infrastructure Protection latest Threats and Approaches

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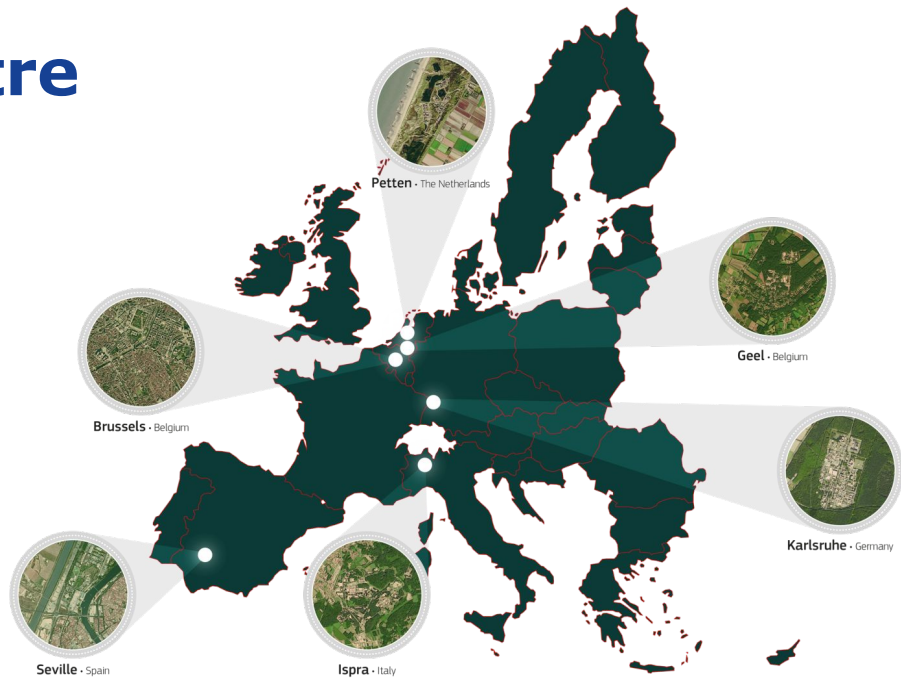**The European Commission's science and knowledge service**
Joint Research Centre

European Commission

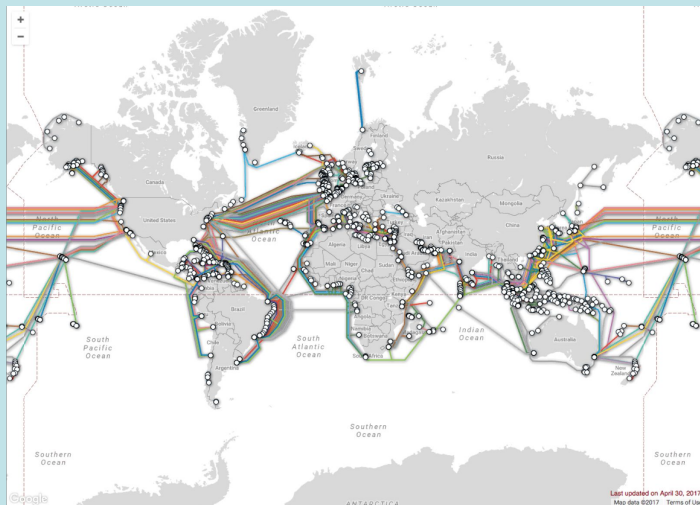# The Joint Research Centre at a glance

3000 staff
Almost 75% are scientists
and researchers.
Headquarters in Brussels
and research facilities
located in 5 Member States.

As the European Commission's science and knowledge service, the Joint Research Centre (JRC) supports EU policies with independent scientific evidence throughout the whole policy cycle.

Petten · The Netherlands

Geel · Belgium

Brussels · Belgium

Karlsruhe · Germany

Seville · Spain

Ispra · Italy

Critical Infrastructures
Vital for economic growth and societal wellbeing

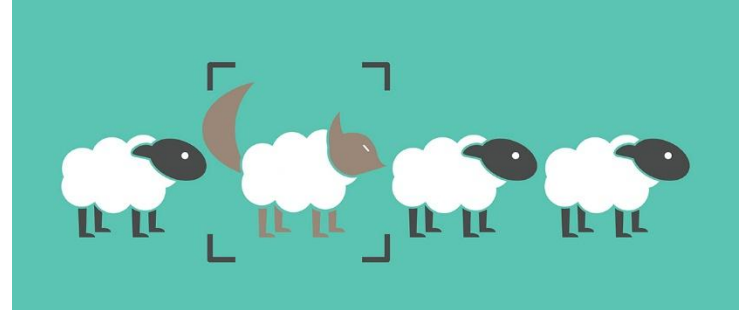**...but have always been threatened by natural or man-made hazards**

Silk Road Economic Belt and Maritime Silk Road
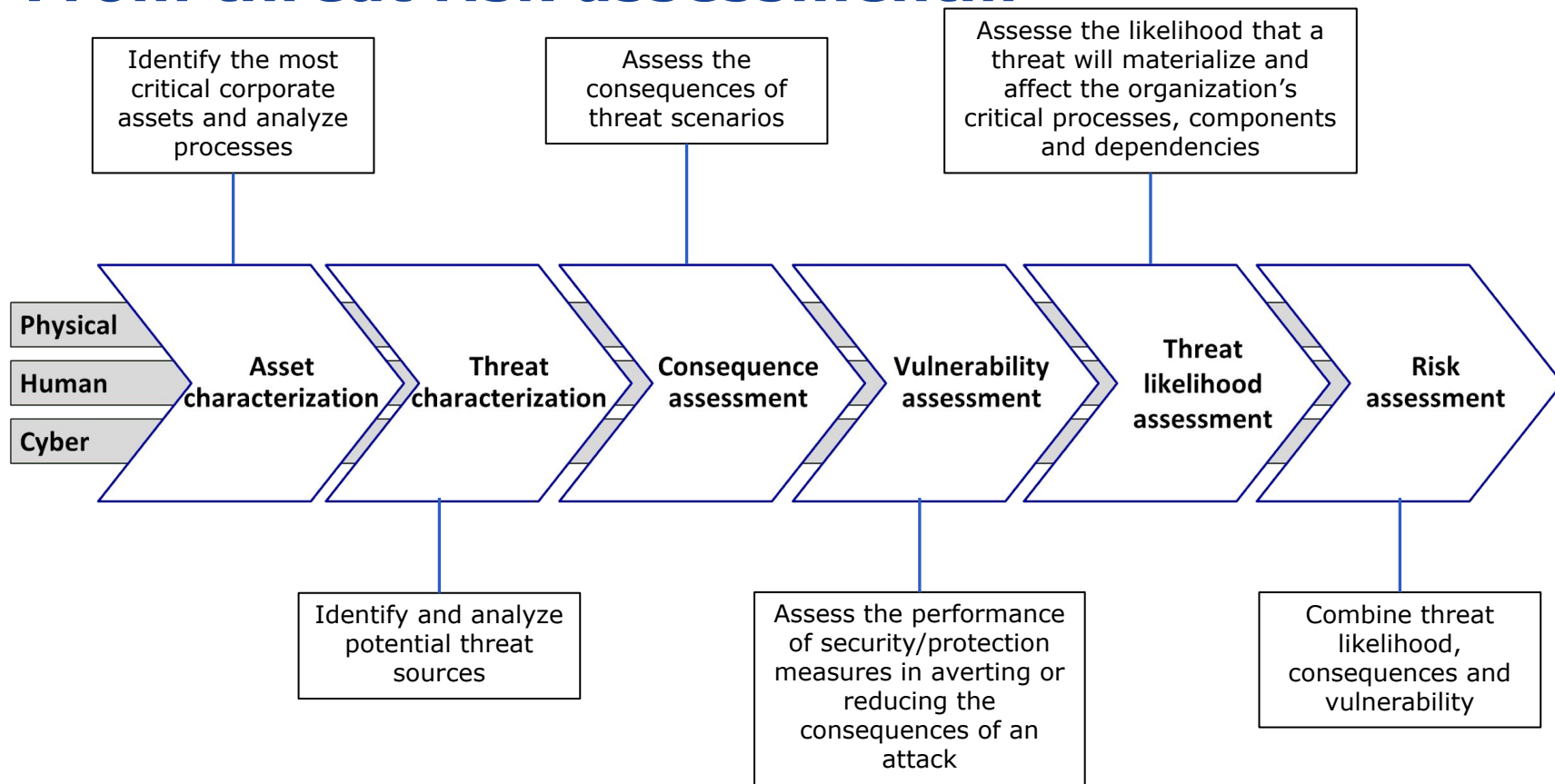
Source: xinhua

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Threat environment: Threat sources

Insider threat
Organized crime
Terrorism
Hybrid threats

From threat risk assessment...

...to Resilience based thinking

- *Q.1 To what extent, for a given scenario, is my infrastructure able to **keep functioning**? This depends on the sectors MyI relies upon and its own **resilience measures***

- *Q.2 How **quickly** will the **recovery process** start and **how long** will it take?*

- *Q.3 Will it start **independently** of other infrastructures?*
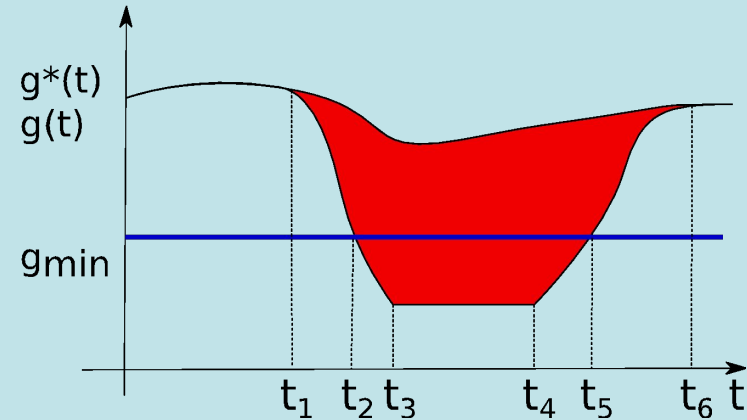
Modelling complexity & interdependencies
A prerequisite to resilience
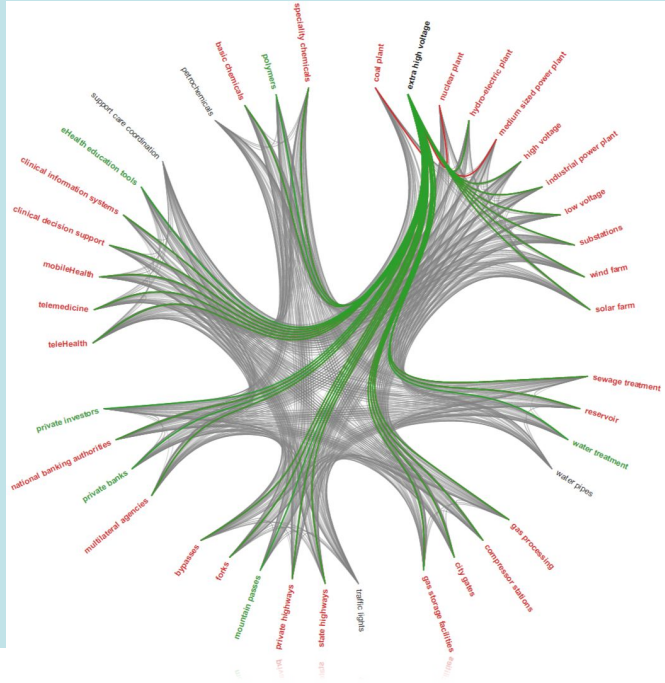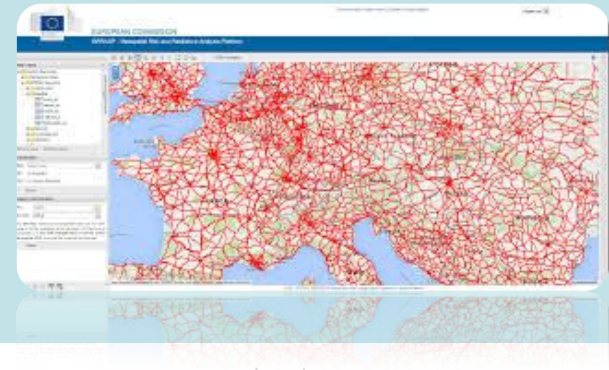

Cascading effects across sectors

Dependencies across countries

Modeling, simulation and analysis tools

Complexity → Computational Cost

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And some new threats....

"…the mixture of **coercive** and **subversive** activity, **conventional** and **unconventional** methods (i.e. **diplomatic, military, economic, technological**), which can be used in a coordinated manner by **state** or **non-state** actors to achieve specific objectives while remaining **below the threshold of formally declared warfare**."*

*JOINT COMMUNICATION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL Joint Framework on countering hybrid threats, a European Union response, JOIN(2016) 18 final

HT aim at creating *ambiguity*

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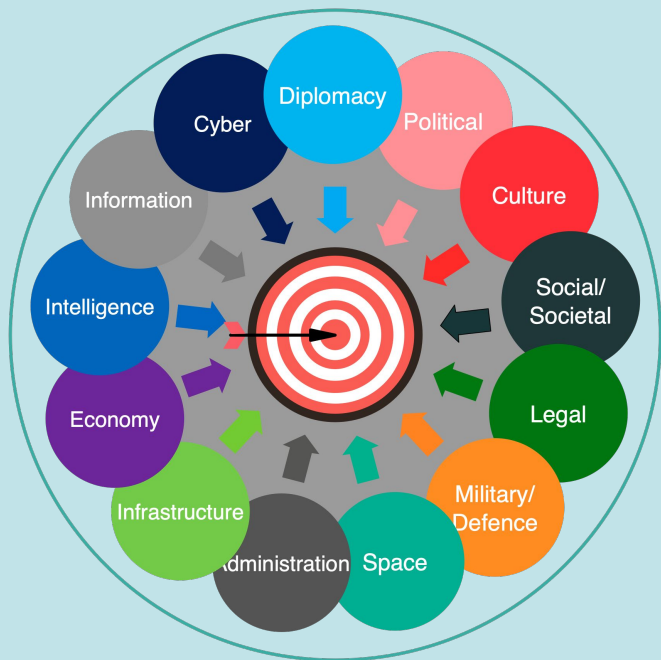
Hybrid Threats Modus Operandi
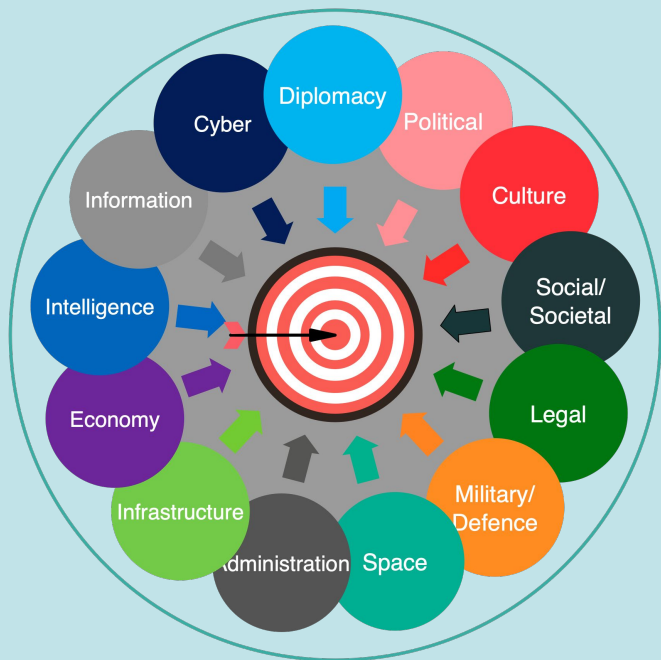
- Adversary selects **tools** to achieve **strategic objectives**
- **Tool** targets **domains** or the **interface** between them
- Tool exploits **vulnerability** of **domain(s)** or
- Tool takes advantage of an **opportunity**
- **Cascading** across domains

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Hybrid Threats and critical infrastructures

- Adversaries **may take advantage** of disasters
- Adversaries may affect **infrastructure**, **information** and **administration** domains
- **Response** during a crisis can be **compromised**

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The potential for disinformation
September 2019 Lubrizol fire, Rouen, France

(Photo credit: Le Parisien, 2019)

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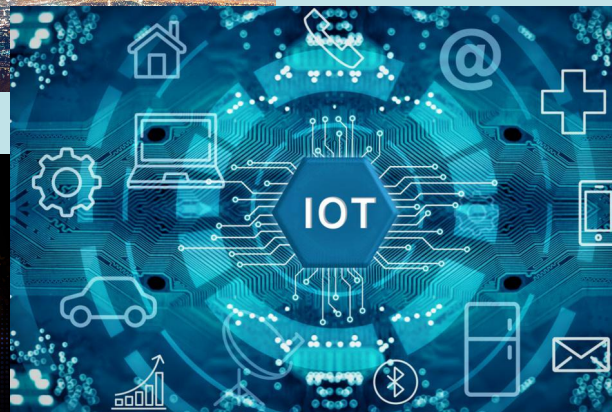
Emerging technologies
Emerging Capabilities vs Emerging Threats

- **5G**
- **Internet of Things**
- **Artificial Intelligence**
- **Quantum Technologies**
- ✔ Vast **technological potentials**
- ✔ New **business opportunities**
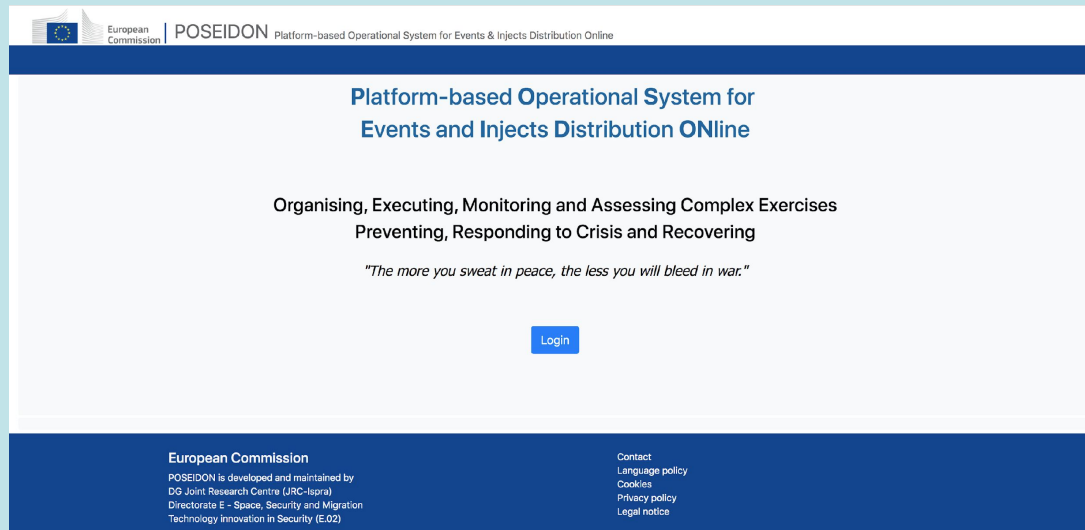- ❖ Challenging **vulnerability and threat landscape**

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Industrial Automation & Control Systems
Cybersecurity Certification

- EU Cybersecurity Certification Framework - **Cybersecurity Act**
  - Increase **cybersecurity**
  - Increase **competitiveness** and **growth** of EU ICT companies
- **ERNCIP** (European Reference Network for CIP) IACS TG
  - Managed and coordinated by DG JRC
- Recommendations for the Implementation of an **IACS Components Cybersecurity Certification Scheme** (**ICCS**)
- Included in the **Union Rolling Work Programme**
  - Candidate EU Cybersecurity Certification Scheme

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Exercises
The more you sweat in peace, the less you bleed in war

- **POSEIDON**: **Organising, executing, monitoring** and **assessing exercises**

- **Web-based platform**

- **Table-top** and **operational**

- **Complex**, **cross-sectoral**

- **Dedicated installation**

- Used for **PACE 18'**, **EU-IR20**, **GR**, **EC DGs**

European Commission | POSEIDON Platform-based Operational System for Events & Injects Distribution Online

Platform-based Operational System for Events and Injects Distribution ONline

Organising, Executing, Monitoring and Assessing Complex Exercises
Preventing, Responding to Crisis and Recovering

"The more you sweat in peace, the less you will bleed in war."

Login

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POSEIDON is developed and maintained by
DG Joint Research Centre (JRC-Ispra)
Directorate E - Space, Security and Migration
Technology innovation in Security (E.02)

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Take away messages

The Threat landscape is continuously changing | 01

Critical Infrastructures might be the means to an end | 02

Disruptive and emerging technologies will change the way that Critical Infrastructures need to be secured | 03

Cybersecurity Certification of Critical Infrastructure Components | 04

Exercises are a must-do for maximising prevention and response capabilities | 05

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