UTILITALIA
imprese acqua ambiente energia

VERITAS

FESTIVAL DELL'ACQUA
VENEZIA 10-11 OTTOBRE 2019

Water Europe
Technology & Innovation

Water Europe

A common vision for water, research & Innovation

DIGITAL WATER CHALLENGES

Andrea Rubini
Director of Operations
Water Europe

Who are WE?

- Water Europe is the **voice and promotor of water-related RTD and innovation in Europe**.
- recognized by the EC as the **European Technology Platform for Water**

- **Mission:**
  - ✓ Improve **coordination and collaboration** in the water sector and water using sectors in the EU and beyond;
  - ✓ Enhance **performance and competitiveness** of the European water sector and water using sectors;
  - ✓ Contribute to solving **global challenges** through RTD&I.

- **Water Europe Strategy:**
  - ✓ Whole value chain of water
  - ✓ WE Water Vision
  - ✓ Services to members

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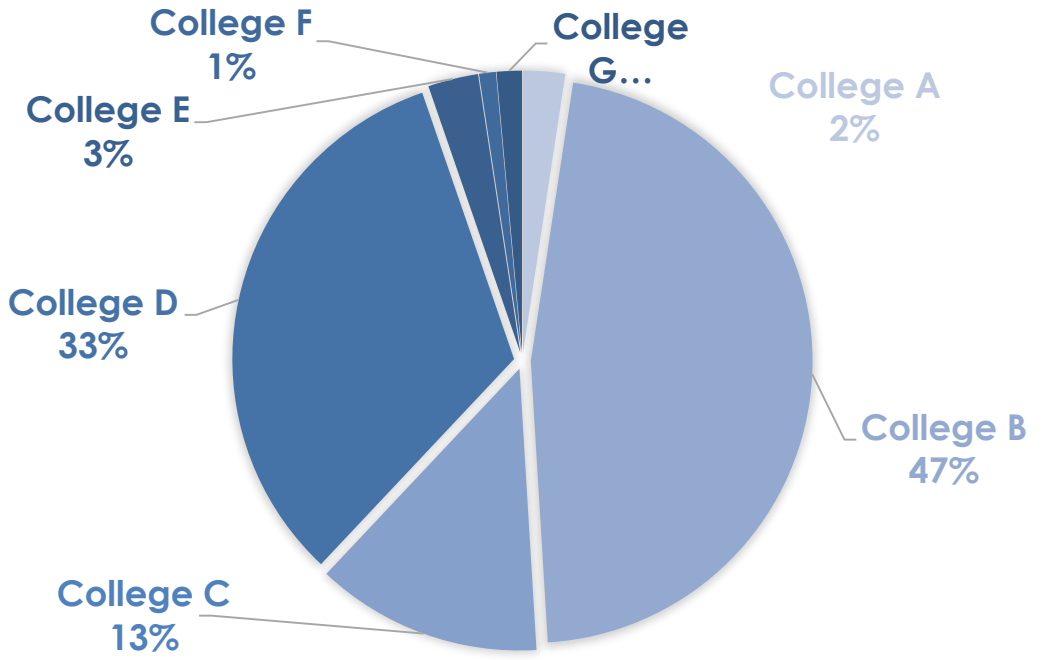
WE Membership

Water Europe Colleges

College A: Multinational corporations
College B: Research & Technology developers
College C: Utilities
College D: Suppliers & SMEs
College E: Large water users

College F: Public Authorities
College G: Civil Society Organisations

Members per college



211 members

26 countries

+5% in 2017

Whole Water cycle

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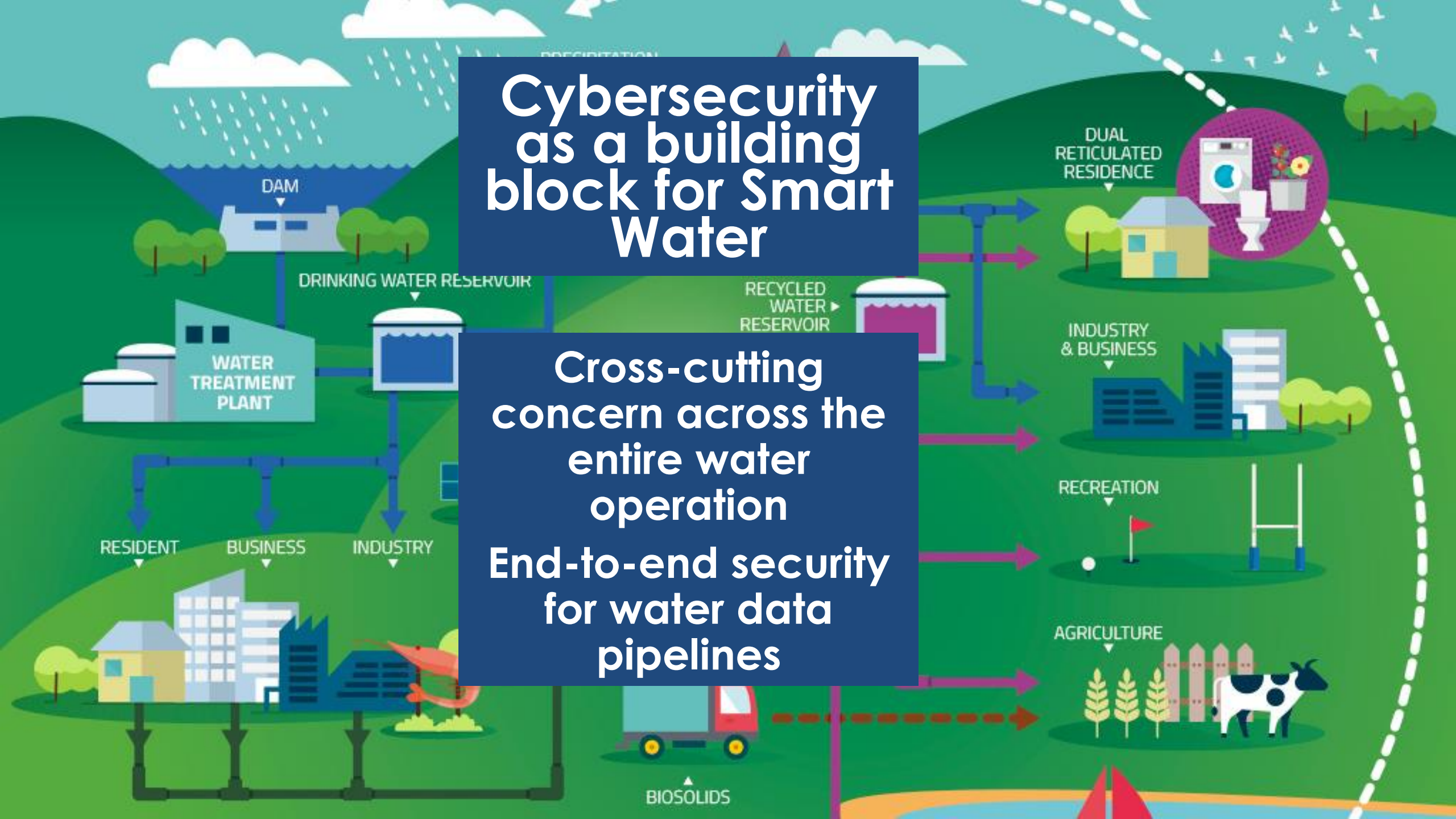
Water becomes…….

DIGITAL

Artificial Intelligence, IoT, cloud computing, robotics… digital disruption is transforming Water Networks into cyber-physical data-centric systems.

Goal: to use trusted data to get the most from every single drop of water.

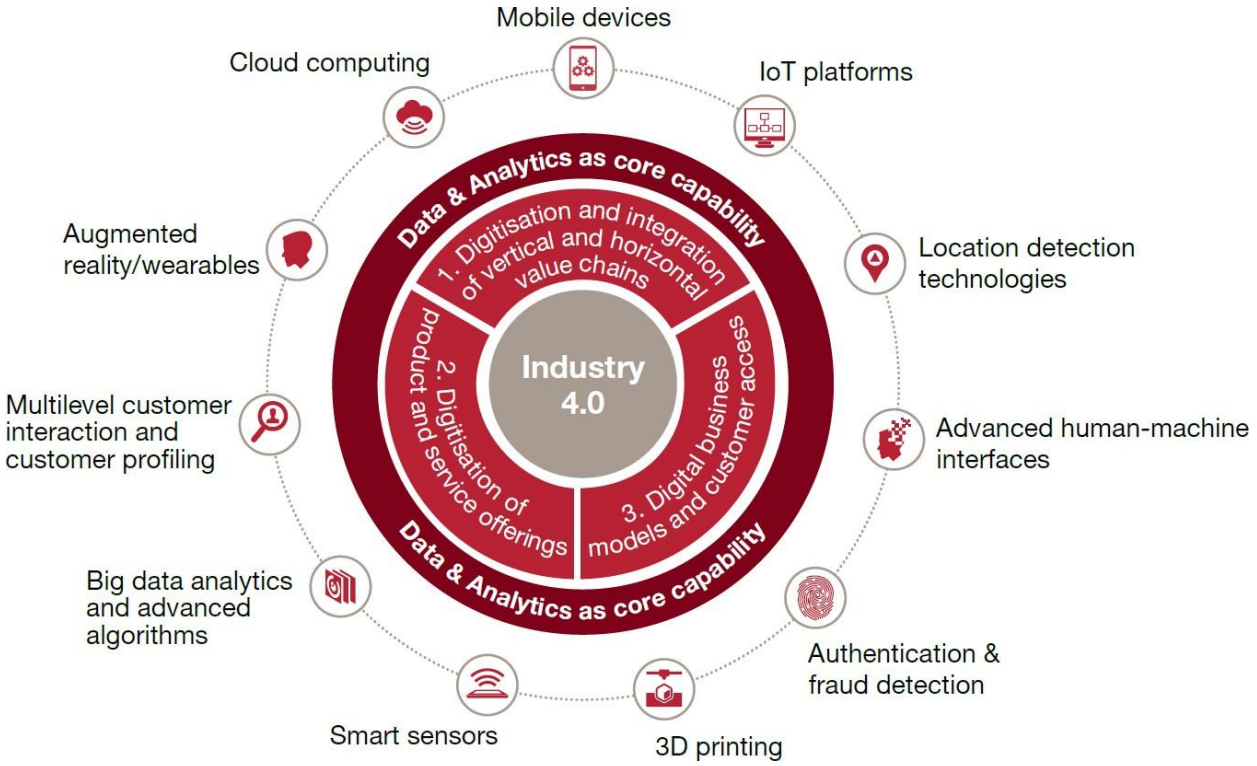


Cybersecurity as a building block for Smart Water

Cross-cutting concern across the entire water operation

End-to-end security for water data pipelines

Industry transformation powered by 4.0



Principles

- Interoperability
- Decentralization
- Virtualization
- Real time
- Service oriented
- Modularity

(*) pwc, 2016 Global Industry 4.0 Survey

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Cybersecurity facts on the Industrial Internet of Things

Threats

TECHNICAL ISSUES

Lack of authentication in sensors, lack of protocols in gateways.
Lack of standards in IoT

RISK

Equipment damage, large environmental damage, service outage, personal harm

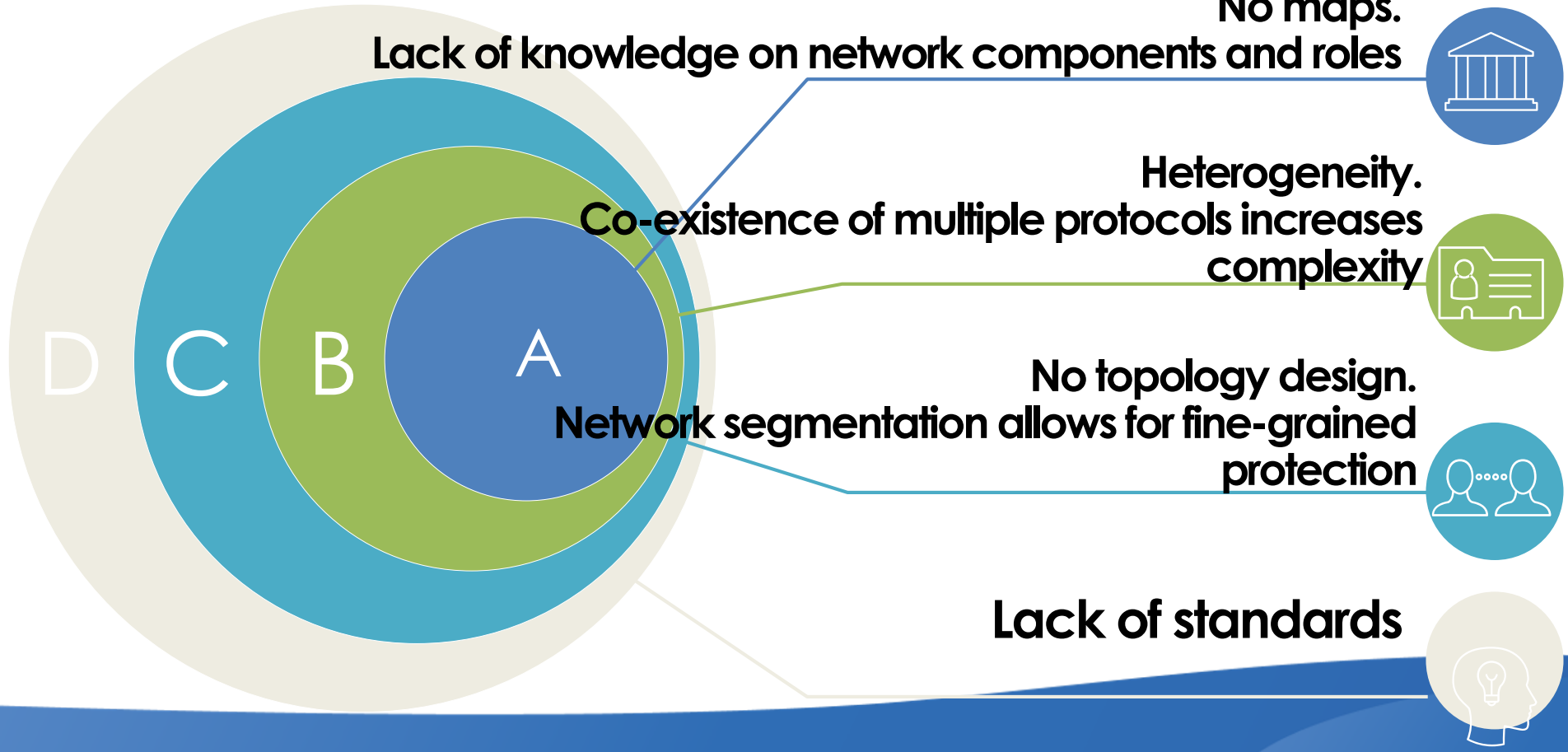
FAST MOVING

OT gets today more than 30% of cyberattacks.
Flying a plane while building it

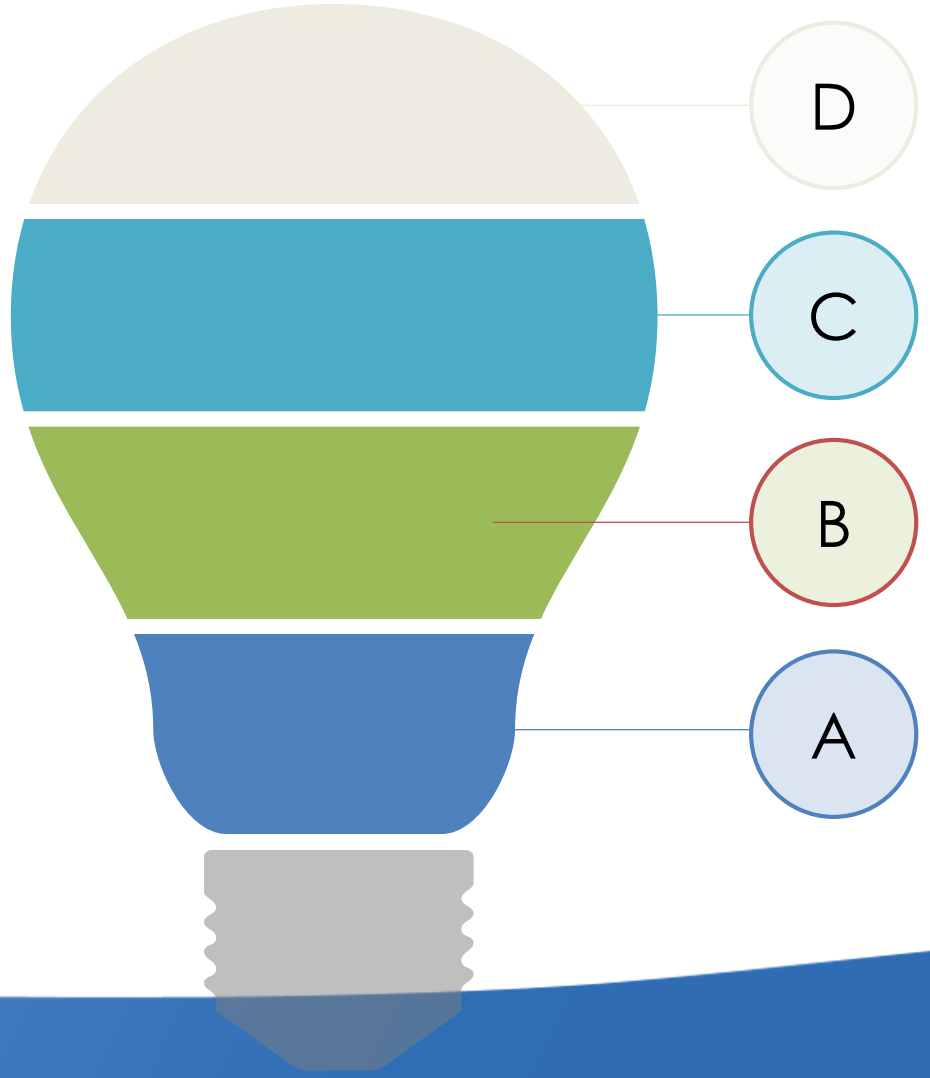
SENSORS, SMART METERS, COLLECTORS, GATEWAYS

Devices with constrained capabilities
Highly distributed environment

Cybersecurity facts at industrial network level



Cybersecurity strategies at the backend



INSIGHT AND SECURITY ANALYTICS

Grow your insights on normal/abnormal system behaviors

INFRASTRUCTURE

Provide dedicated HW/SW resources for real-time security analytics

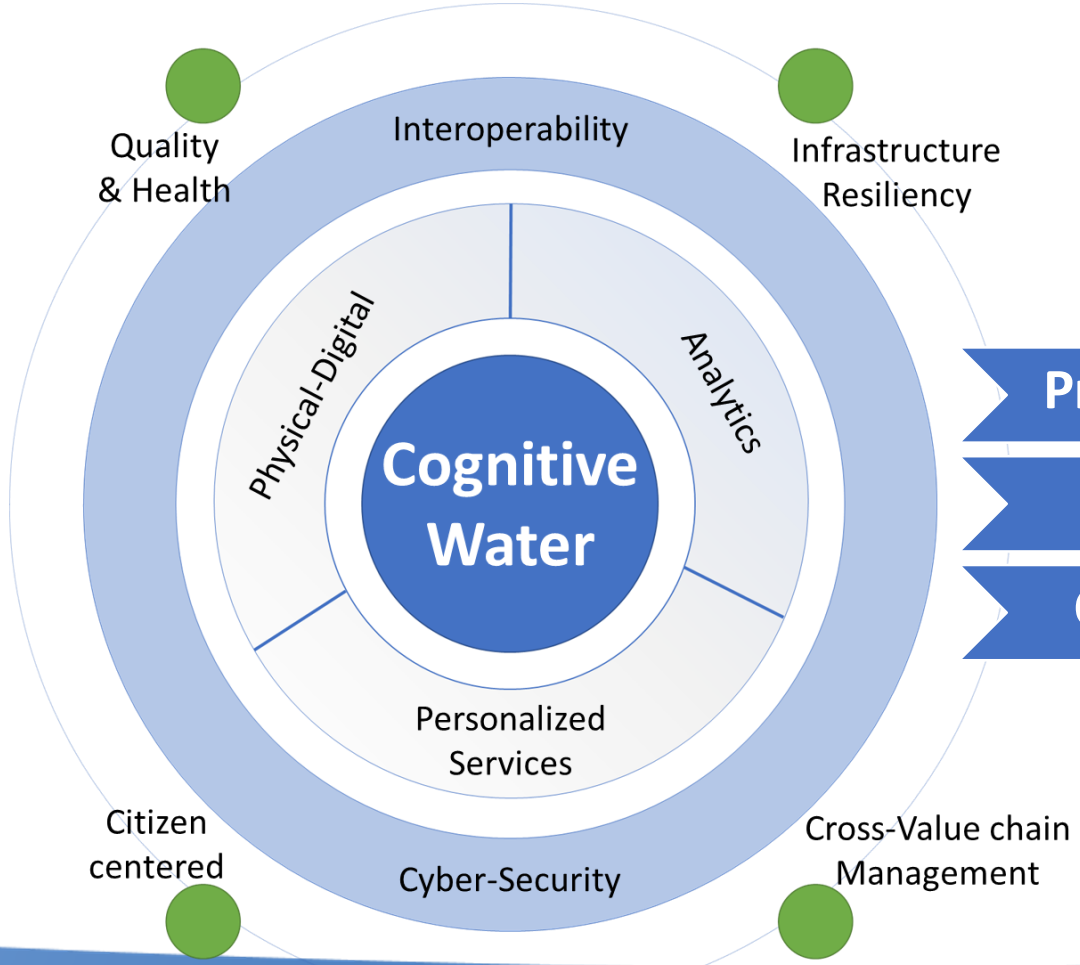
INTEGRATION

Any internal and external dataset becomes a potential source of insight

COLLECTION

ETL procedures on streaming sources to ensure the availability of raw data for security analytics

Paradigm shifts



Product	Service
Silos	Cross
Close	Open

- Trans dimensional Integration
- User-Consumer Trust
- Data value
- Predictive Management

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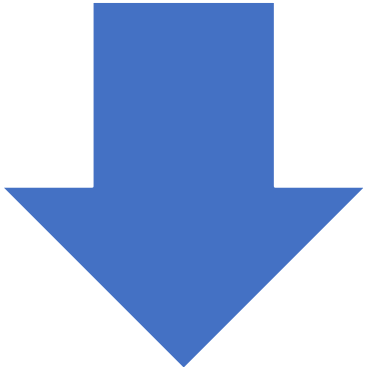
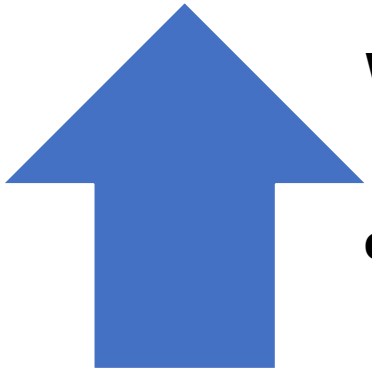
VALUE OF DATA VALUE OF WATER

- ✓ **A flood of data…**
- ✓ **It is not just about the data, it is about the quality of decisions**
- ✓ **Better profit of opportunities that data-driven insights can bring to the water industry**



The Value of Data

The Value of Water



Water stake holders can better understand the value of water if they maximize the potential of internal and external data to deliver insights to drive their decisions.

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Paradigm shifts

"An efficient management lies in trusted and secure data"

Build trust in data and analytics

(*) KPMG, 2016 Building trust in data analytics

Increase trust in data

It's critical to ensure the quality of underlying data, align data analytics to the organization's goals, and apply analytics ethically.

1. Create purpose by clarifying goals and raise awareness to increase internal engagement,
2. Develop an internal data analytics culture; open the 'black box' to encourage greater transparency,
3. Have a 360-degree view by building ecosystems,
4. Stimulate innovation and analytics R&D to incubate new ideas and maintain a competitive stance.

Increase trust through high-quality data, connecting analytics to the organization's real-world goals, and opening the "black box" of complexity

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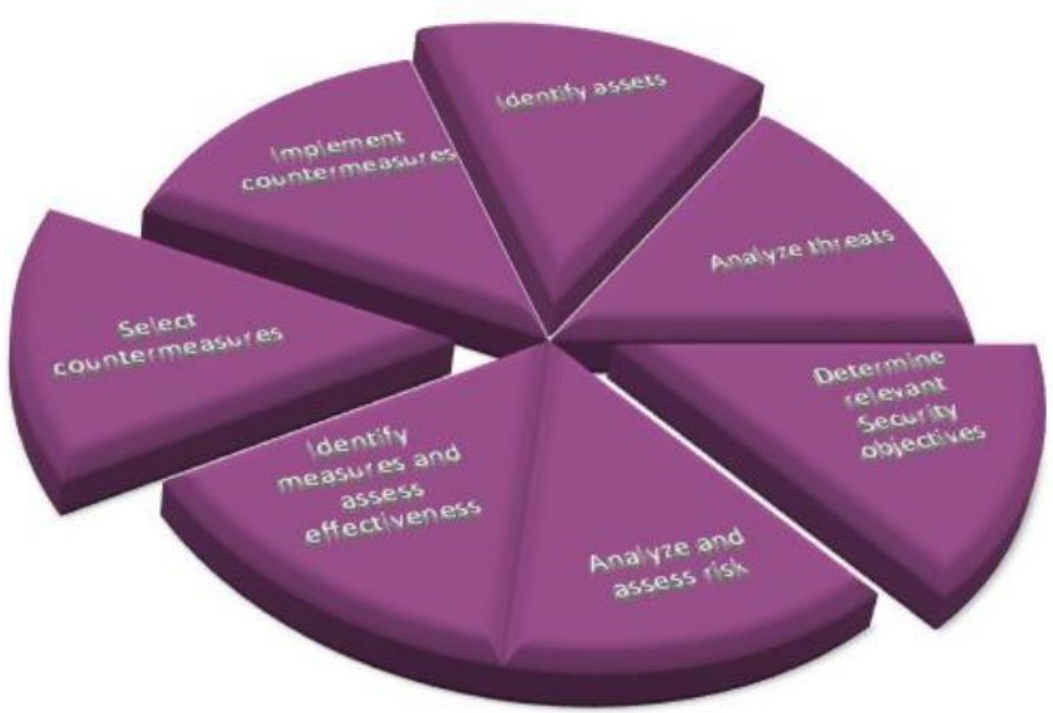
Increase cybersecurity in data

It’s critical to ensure the security of data processed, from the time of information gathering, transmission as well as processing.



1. There is a false sense of security, which causes systems to be exposed to a large number of threats and attacks.
2. **Training and awareness:** one of the essential aims is to be aware that the risks to which current and future machinery is exposed will increase considerably.
3. **Security-by-design:** Cybersecurity must be taken into account from the first minute of machine design and manufacturing. The measures introduced from the beginning considerably improve the resilience of the systems.

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Digital single market for water services

2019

Action Progress

European Commission
Directorate General for Communications Networks, Content & Technology (DG CONNECT)

EASME

ict4water.eu

Roadmap 2015

Technological, social and organizational challenges

Roadmap 2016

Main gaps and disruptive technological challenges to be addressed

Action Plan2018

Set of actions to boost borderless digital single market of water services

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Action plan – Cyber security

CS.1

Develop a common approach to **water cybersecurity**

- Deploy **proactive security by design**, provide adequate **security certification** of products and services, and increase capacity to **prevent, deter, detect and respond to cyberattacks.**
- Develop secure schemas that permit the **trustable sharing of information** among sensors and other type of data management services, which **fully cover all the data value chain, assuring that security tools arrive to the consumer**,
- **Fulfil the security faults in the adoption of interoperable open technologies**.
- **Collaborative work to build common security frameworks together with other sectors** (energy, trading, industry...).

CS.2

Contribute in Cybersecurity by developing ICT4Water **Anonymization methodologies and procedures**

- Deploy and develop reliable standards and procedures that **anonymize data**.
- Develop tools **secure the channels and anonymize the data transmitted** through the entire ICT platform.

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Digital single market for water services

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EASME

ict4water.eu

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2019

- WVC Minimal Reference Model
- KPIs
- Action Progress & Leaders

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Legislative Innovations

- L PIC

  8/2011 CRITICAL INFRASTRUCTURE LAW
  RDL 704/2011

- RGPD

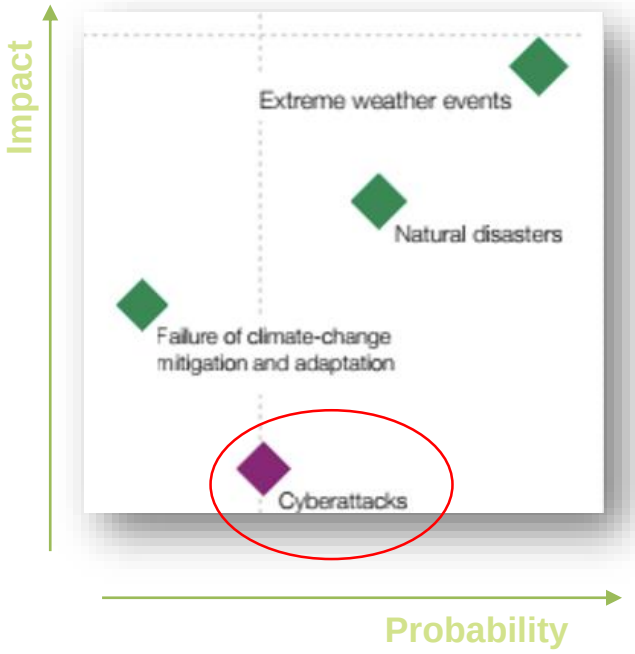
  3/2018 GENERAL DATA PROTECTION REGULATION

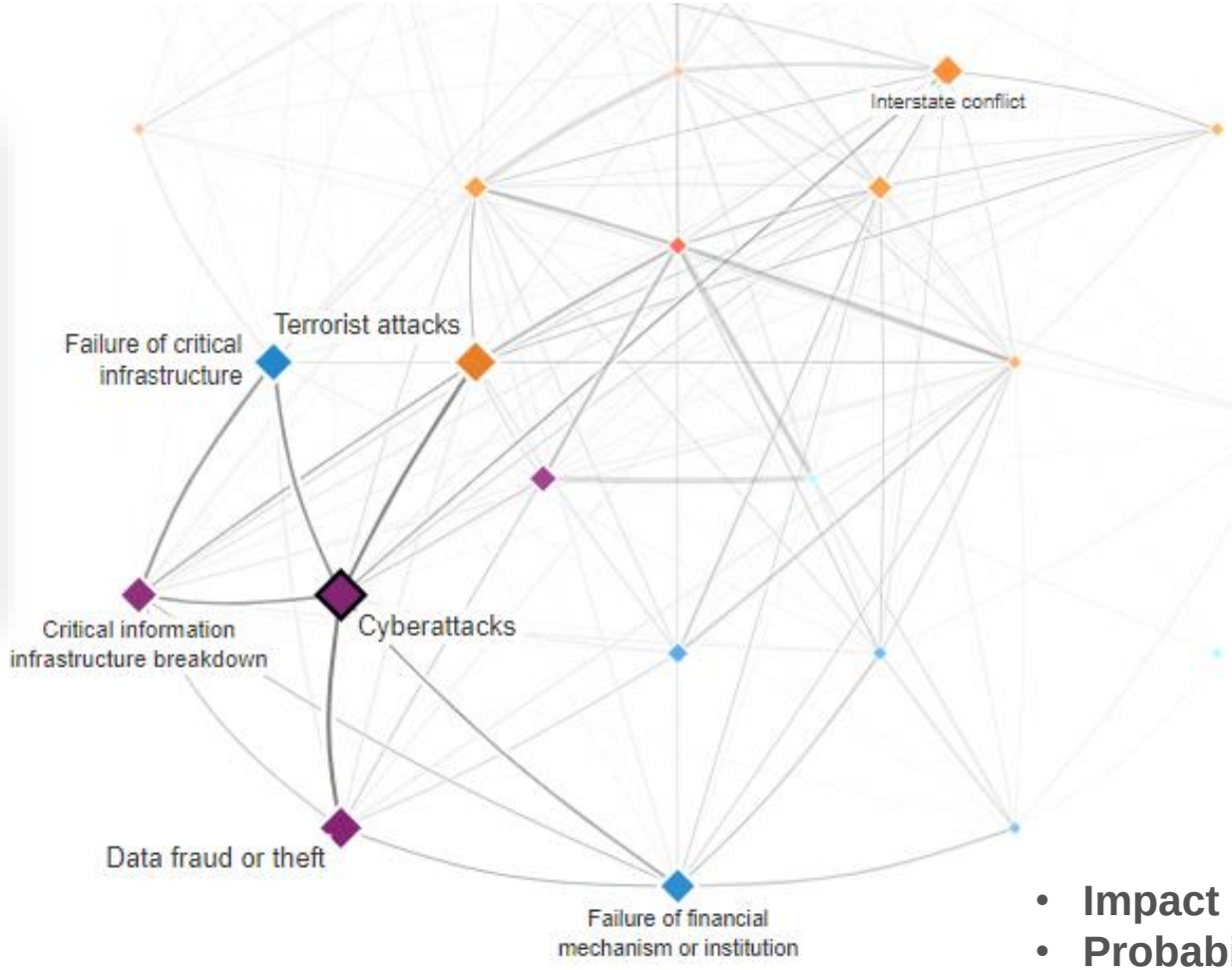
- DIRECTIVA NIS

  RDL 12/2018 OF SEPTEMBER 7 SECURITY OF NETWORKS AND INFORMATION SYSTEMS

The Global Risk Report 2018

Cyber attacks are ranked 3rd in the Top 5

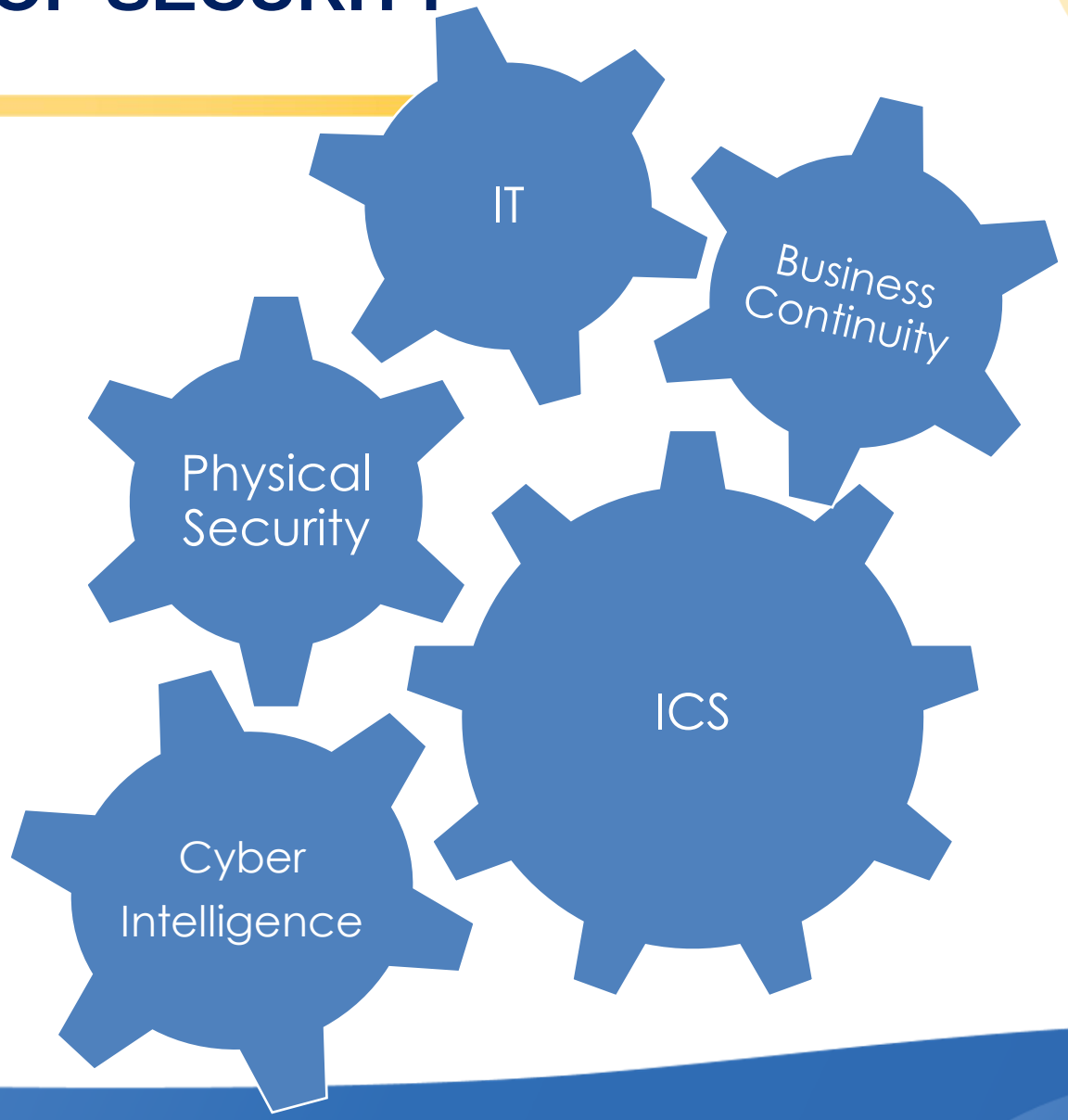




- **Great economic damage**
- **Geopolitical tensions**
- **Loss of confidence in the Internet**

- **Impact** 3.64/5
- **Probability** 4.01/5

THE FIVE AXES OF SECURITY



- SUEZ SOC 360 - Security Operational Center

MONTHLY BLOCKED THREATS

448.519

50 Platforms

MONTHLY INCIDENTS/REQUESTS

330

MONTHLY INCIDENTS

Without impact:

27

With impact:

8

INCIDENTS/SECURITY BREACHES 2018

(CNPIC GUIDE)

17

Protection of Critical Infrastructures

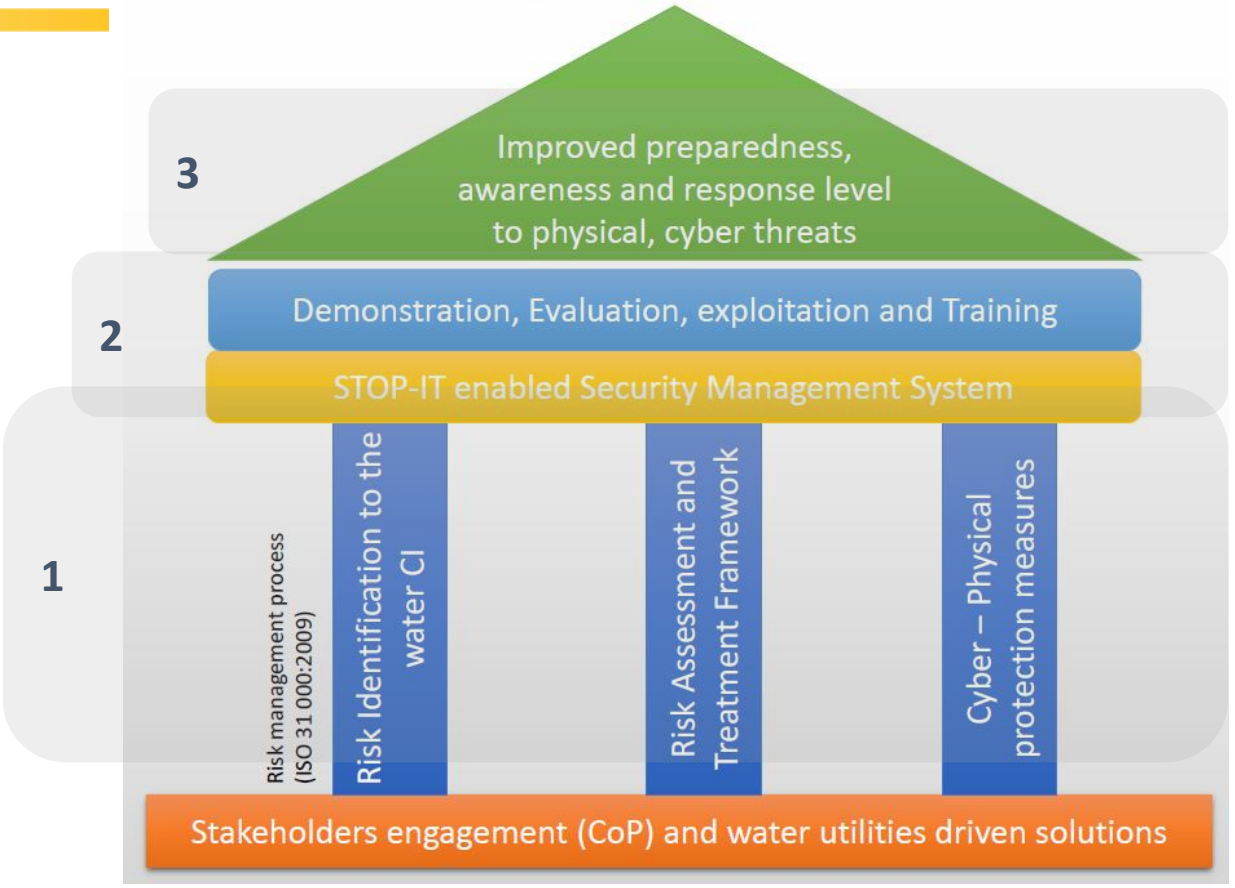
Protection of Critical Infrastructures

https://stop-it-project.eu/

Objective: making water systems secure and resilient by improving preparedness, awareness and response level to **physical, cyber threats**, and their combination.

22 European Partners

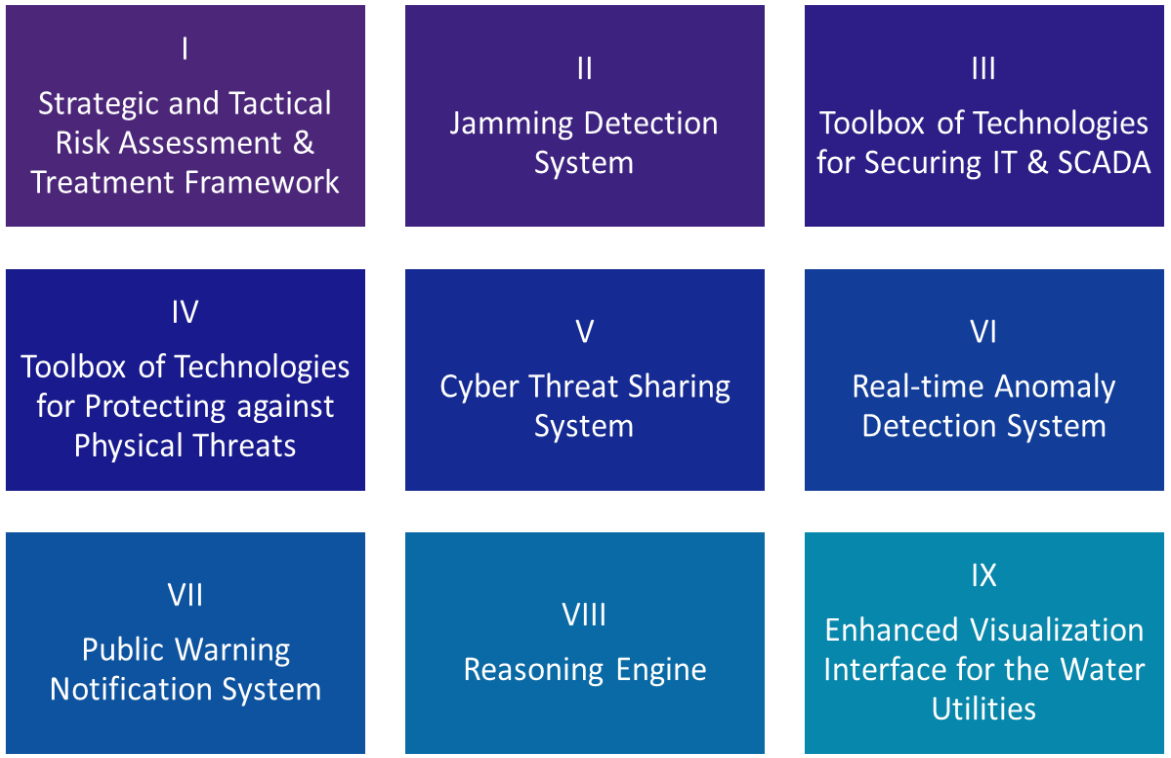
- 7 Research centres
- 4 Front runner utilities
- 4 Follower utilities
- 6 Industries/SME sector
- 1 Technology Platform



Key steps

1. **Develop** an all-hazards **risk management framework** (ISO 31000:2009) for physical and cyber protection of water CIs.
2. **Demonstrate** and evaluate STOP-IT **solutions** at FRs and train FLs
3. Support technology providers on their **route to market**

STOP-IT Platform: **9 modules, 28 tools**



Tools and technologies

1. **Risk identification database and Risk Reduction Measures**
2. Jammer Detector
3. Network Traffic Sensors and Analysers
4. Real-Time Sensor Data Protection
5. **Fault-tolerant Control Strategies for Physical Anomalies affecting the SCADA system**
6. Access Control System using Electronic Locks
7. Fine-grain Cyber Access Control
8. Human Presence Detector using WiFi signals
9. **Water Quality Sensor Placement Tool**
10. Cyber Threat Sharing Services
11. **Real-Time Anomaly Detector**
12. Cross Layer Security Information and Event Management

Thank You

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