# GOOD PRACTICES ON INTERDEPENDENCIES BETWEEN OES AND DSP

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# A CHANGING LANDSCAPE
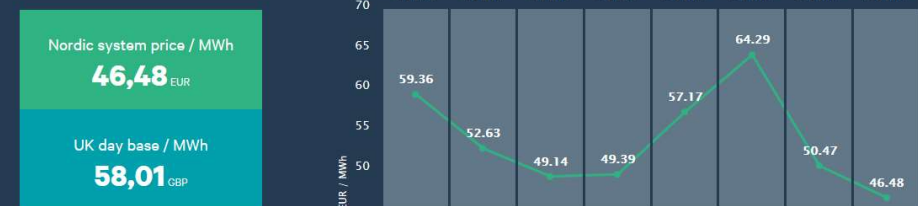
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# SCOPE AND OBJECTIVES OF THE ENISA STUDY
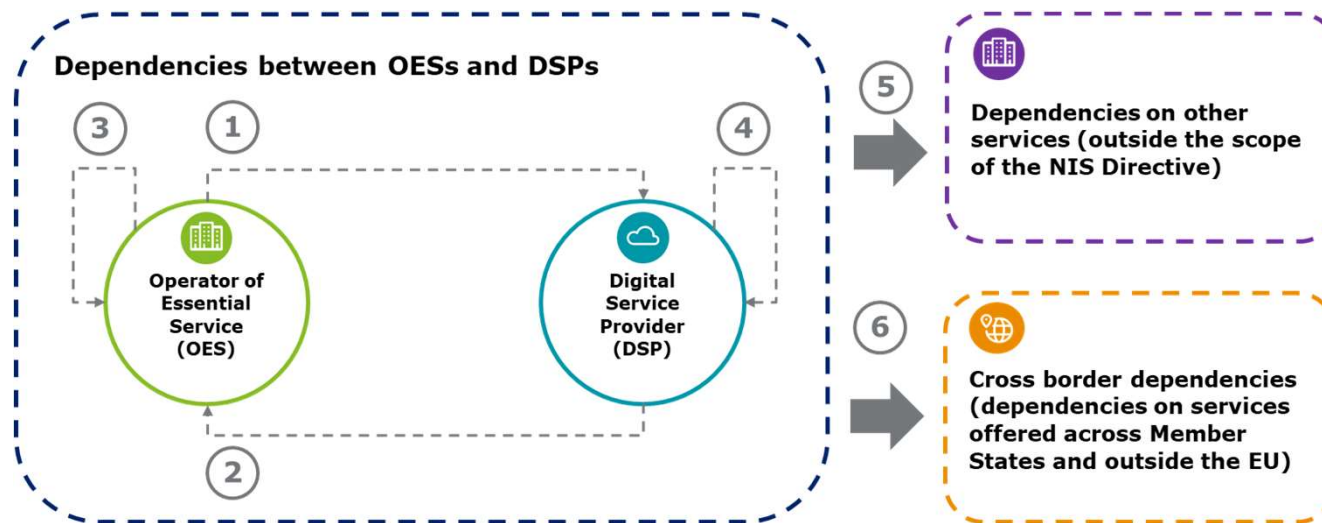


- **Describe interdependencies** among OES and DSP

- Highlight **state-of-the-art** risk assessment practices

- **Propose a framework** for assessing interdependencies

- Identify **good practices**

**Dependency:** A linkage or connection between two services (or underlying infrastructures), through which the state of one service (infrastructure) influences or is correlated to the state of the other

**Interdependency:** A bidirectional relationship between two services (or underlying infrastructures) through which the state of each service (infrastructure) influences or is correlated to the state of the other. More generally, two services (infrastructures) are interdependent when each is dependent on the other.

| Dependency Relationships | Classes of Dependencies |
|---|---|
| • Cross-border (inter)dependencies | • Cyber |
| • Cross-sector (inter)dependencies | • Physical |
| • Functional interconnectedness | • Geographic |
| • Spatial interconnectedness | • Logical |

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# CYBER DEPENDENCIES LANDSCAPE (1)



| OPERATOR OF ESSENTIAL SERVICES | | DIGITAL SERVICE PROVIDERS | | |
|---|---|---|---|---|
| Sector | Subsector | Online marketplace | Online search engine | Cloud computing service |
| Energy | Electricity | Medium | Low | Medium-High |
| | Oil | Low | Low | Low |
| | Gas | Low | Low | Medium |
| Transport | Air Transport | Low | Low | Low |
| | Rail Transport | Medium | Low | Low |
| | Water Transport | Medium | Low | Low |
| | Road Transport | Low | Low | Low |
| Drinking water supply and distribution | | Low | Low | Low |
| Digital infrastructure | | Low | Low | Medium-High |

Low • Medium • Medium-High

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# CYBER DEPENDENCIES LANDSCAPE (2)

# FRAMEWORK FOR ASSESSING (INTER)DEPENDENCIES

- Risk-based scenarios
- NRAs
- Single risk / multiple risk assessments
- Methodological approaches

- Sectorial criteria
- National criteria

**1** Contextualising and Tailoring Assessment

**2** Identification and Modelling of Dependencies and Interdependencies

**3** Analysis and Measurement of Dependencies and Interdependencies

**4** Evaluation of Impact of Dependencies and Interdependencies

- Scope
- Cross-border dimensions
- Previous incidents / lessons learned
- Stakeholder involvement
- Timeframe

- Scenarios and simulations
- Tools
- Metrics

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# CHALLENGES FOR OES/DSP

- Lack of Data
- Complexity of Service Supply Chains
- Specialized Methodologies
- Lack of Skills
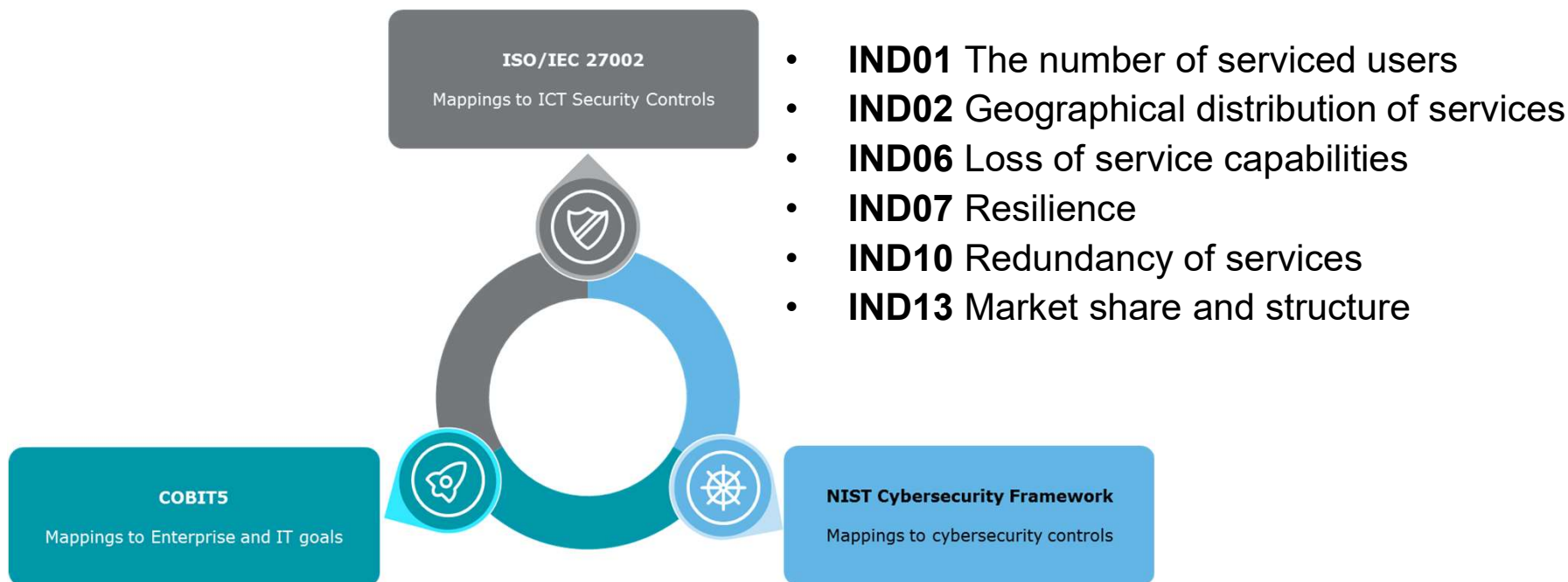- Taxonomy of Incident Impact Assessment

# CHALLENGES FOR NCA

- Sectorial Approach
- Lack of Data
- Complexity of Scenarios
- Cross Border Notification and Coordination
- Identification of Cross Border (Inter)dependencies
- Identification of Operators of Essential Services
- Auditing OES

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# INDICATORS FOR ASSESSING (INTER)DEPENDENCIES



- **IND01** The number of serviced users
- **IND02** Geographical distribution of services
- **IND06** Loss of service capabilities
- **IND07** Resilience
- **IND10** Redundancy of services
- **IND13** Market share and structure

ISO/IEC 27002
Mappings to ICT Security Controls

COBIT5
Mappings to Enterprise and IT goals

NIST Cybersecurity Framework
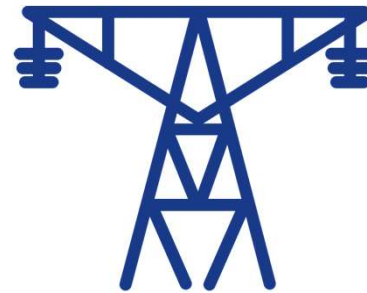Mappings to cybersecurity controls

# GOOD PRACTICES

## For OES/DSPs

- Operational accounts of (inter)dependencies

- Training and Awareness

- Methodologies and Tools

## For NCAs

- Information Sharing

- Methodologies and Tools

- Cybersecurity Intelligence

# RECOMMENDATIONS

## OES & DSPs

- Conduct **empirical investigations** to collect data
- Promote **training and awareness**
- Address (inter)dependencies at **operational level**

## NCAs

- Develop **common taxonomy** of incident impact assessment
- Facilitate **information sharing**
- Integrate **cross-border** (inter)dependencies in NRAs

## All

- Develop and integrate **methodologies and tools**
- Invest on **resilience**

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# THE WAY FORWARD

Just Published!

Good practices on interdependencies between OES and DSPs

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www.enisa.europa.eu    European Union Agency For Network and Information Security

## What next?
## Specific scenarios

- Energy?
- Cloud?

# THANK YOU FOR YOUR ATTENTION

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