



Joint OECD-JRC Workshop

“System thinking for critical infrastructure resilience and security”

Energy vulnerabilities and challenges – EDP view

Paris, 24-25 September 2018

Energy vulnerabilities and challenges – EDP view

Challenges

1



Main risks

2



Key dependencies

3



Resilience approach

4




Public-private partnership



Energy vulnerabilities and challenges – EDP view

Main risks

1



Main risks

2



Key dependencies

3



Resilience approach

4



Public-private partnership



Energy vulnerabilities and challenges – EDP view

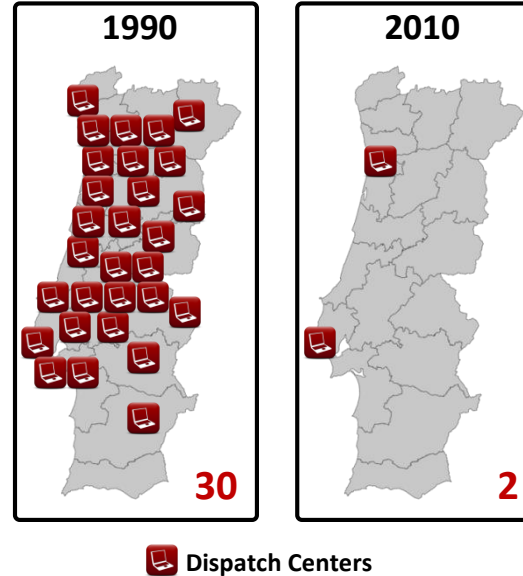
Main risks

Digital transformation

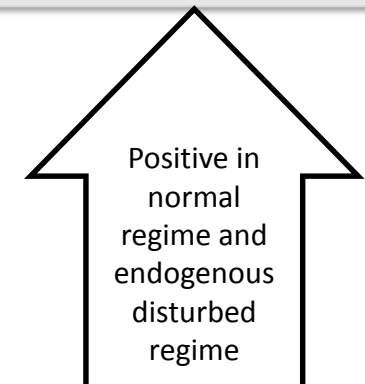
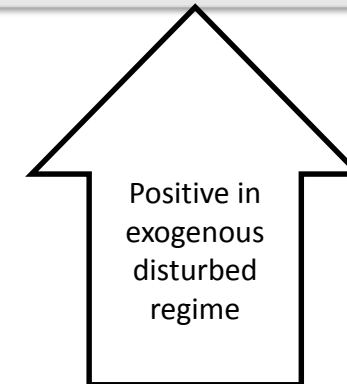
Rapid technological development

Resilience

1 Centralization



Past	Present
Local command	Central command
Isolated assets	Interconnected assets
Numerous HR	Few HR



2 Legacy assets

We have to live with energy assets for many years, meaning that we have to go for roundabouts when different technological age assets coexist introducing vulnerabilities



Energy vulnerabilities and challenges – EDP view

Main risks

Digital transformation

Rapid technological development

Resilience

Distributed Energy Resources (DER)

CI of today, could not be CI of tomorrow

Who will support the backup power service today held by traditional generation?

Who will support the distribution redundancy today held by traditional distribution?

Resilience it's not Service Continuity

Today operators have service continuity indicators

Those indicators exclude exogenous major events


Will regulators made “resilience” mandatory?



Energy vulnerabilities and challenges – EDP view

Key dependencies

1



Main risks

2



Key dependencies

3



Resilience approach

4



Public-private partnership



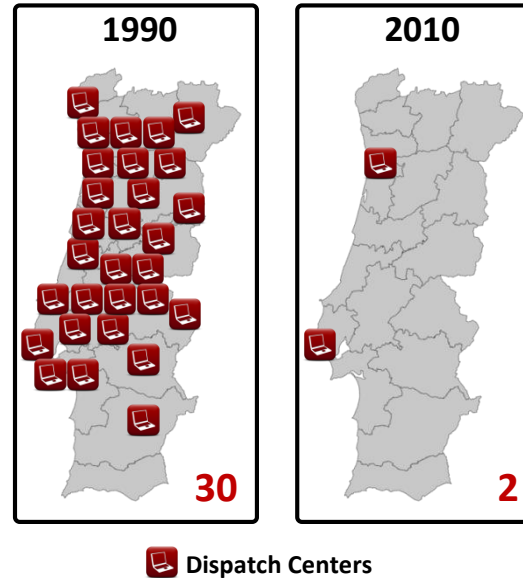
Energy vulnerabilities and challenges – EDP view

Key dependencies

Communication

Others

Network and field teams



Vicious cycle



Affects deploy of service by affecting our resorts

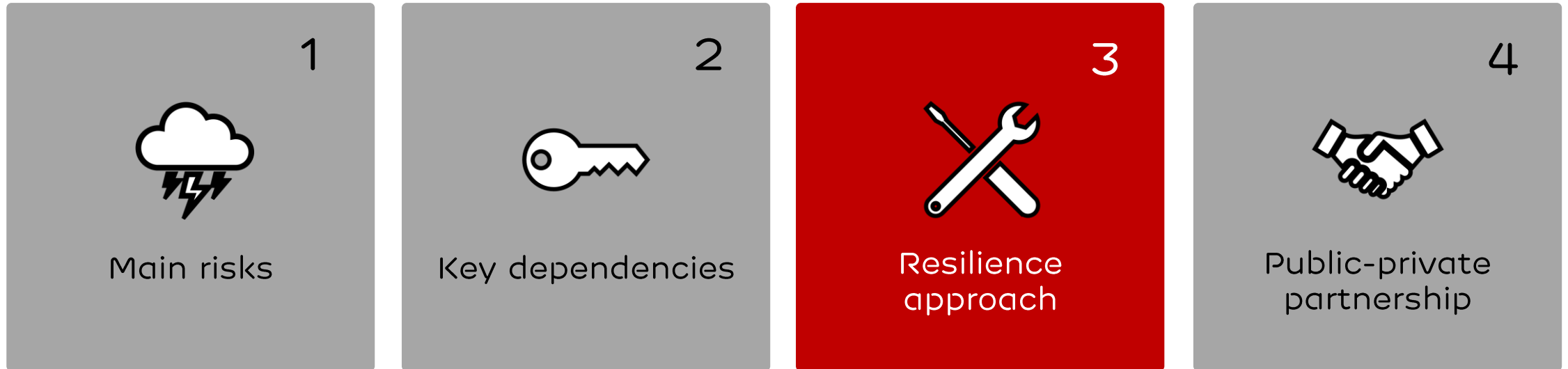
Transport sector: affects the distribution network assets transportation logistic

Water sector: affects the hydric generation and also thermic generation



Energy vulnerabilities and challenges – EDP view

Resilience approach



Energy vulnerabilities and challenges – EDP view

Resilience approach

Asset-centered approach

Emergency and contingency plans

Operator system approach

Business Continuity plans (resource based)

Multi-sector system approach

Coordination and mutual assistance plans



Energy vulnerabilities and challenges – EDP view

Public-private partnership

1



Main risks

2



Key dependencies

3



Resilience
approach

4



Public-private
partnership



Energy vulnerabilities and challenges – EDP view

Public-private partnership

Multi-sector system approach

1 Public actors coordination

Sector regulator asks for service continuity

CI authorities asks for resilience

2 Multi-sector coordination

CI as an island approach versus CI as a system approach, each CI resilience depends of other infrastructure sometimes not classified as critical



THANK YOU

ricardo.messias@edp.pt

