

Establishment of a FramewORk for Transforming current EPES into a more resilient, reliable and secure system all over its value chain



....

....

This project has received funding from the European Union's Horizon Europe Energy Research and Innovation programme under Grant Agreement No. 101075665



1st Annual Conference on Critical Infrastructure Resilience, Brussels, 2023.09.20-21

The Horizon Europe project eFORT: establishment of a FramewORk for Transforming current EPES into a more resilient, reliable and secure system all over its value chain

Esteban Gutiérrez

CIRCE Techcnological center

edgutierrez@fcirce.es



This project has received funding from the European Union's Horizon Europe Energy Research and Innovation programme under Grant Agreement No. 101075665





Miguel Gutierrez Jr./The Texas Tribune



"It looked like the end of the world": Listen to the stories of Texans who lived through 2021's historic winter storm

BY JACOB OHARA, ASHLEY MIZNAZI AND TODD WISEMAN FEB. 17, 2022

One year later, dozens of Texans from around the state shared their memories about an unforgettable storm. FULL STORY \rightarrow



PG&E: California utility firm files for bankruptcy after deadly 2018 wildfires

Company is facing hundreds of lawsuits from victims of recent fires and tens of billions of dollars in potential liabilities



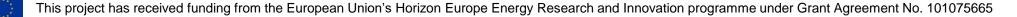
• A home burns as the Camp fire rages through Paradise, California, on 9 November. PG&E is facing billions of dollars in liabilities over 2018 wildfires. Photograph: Noah Berger/AP

Industroyer: An in-depth look at the culprit behind Ukraine's power grid blackout

Malware which speaks the language of industrial machines is a danger to all of our critical services.



Source: https://www.entsoe.eu/data/map/



Objective

Main objective of the eFORT Project is...

... to make European power grids more resilient and reliable to failures, cyberattacks, physical disturbances and data privacy issues.

How?

To this end, a set of **technological innovations** will be developed for the **detection**, **prevention** and **mitigation** of risks and vulnerabilities with positive impacts on power system operation and stability.

The eFORT solutions will be demonstrated at **TSO**, **DSO**, **substation** and **consumer levels** in **4 real demonstration grids** that have been selected considering their complementarities and relevance to tackle the main threats of current European power systems.







Demo overview

D1 – Escúzar (Granada, Spain)

- Microgrid and user level
- DER resources



- D3 Sarentino Valley (Italy)
 - MV and LV distribution
 - Smart plant regulation and grid control



D2 – Delft (The Netherlands)

- Pan-European transmission system (TENNET infrastructre in NTH and Germany)
- Generation, substations and TSO-DSO points











Demo cases

DSO- MICRO GRID	PAN EUROPEAN TRANSMISION LEVEL	REMOTE DISTRIBUTION GRID	DIGITAL
loT, blockchain and cybersecurity in a prosumer-grid	Cascading effects and restoration of interconnected power grids	Flexibility and islanding on mountainous and remote areas	Digitalisation and secure design of a substation
Blockchain technology IoT security Secure DER operation SecureBox IDS/IPS RTU (substation)	 Control Room of Future (training programs) Interarea oscillations impact on TSO stability Self-healing algorithm Decision support techniques Digital Twin whole EPES 	 Real-time decision support system for grid restoration Control scheme for islanding operation mode Digital twin Innovative services to exploit resources (ChatBot) 	 Threats and countermeasures analysis RTUs and IEDs Real-time communications (LAN, PTP, TSN, etc.) Design for digital buses BIM methodology IDS/SIEM

Vulnerabilities database Interactive visualization tool Dynamic risk assessment tools (cyber and physical)

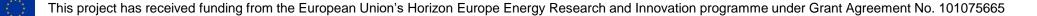


Blockchain for grid resilency and verification

e FORT

•

Vulnerabilities database Interactive visualization tool Dynamic risk assessment tools (cyber and physical)



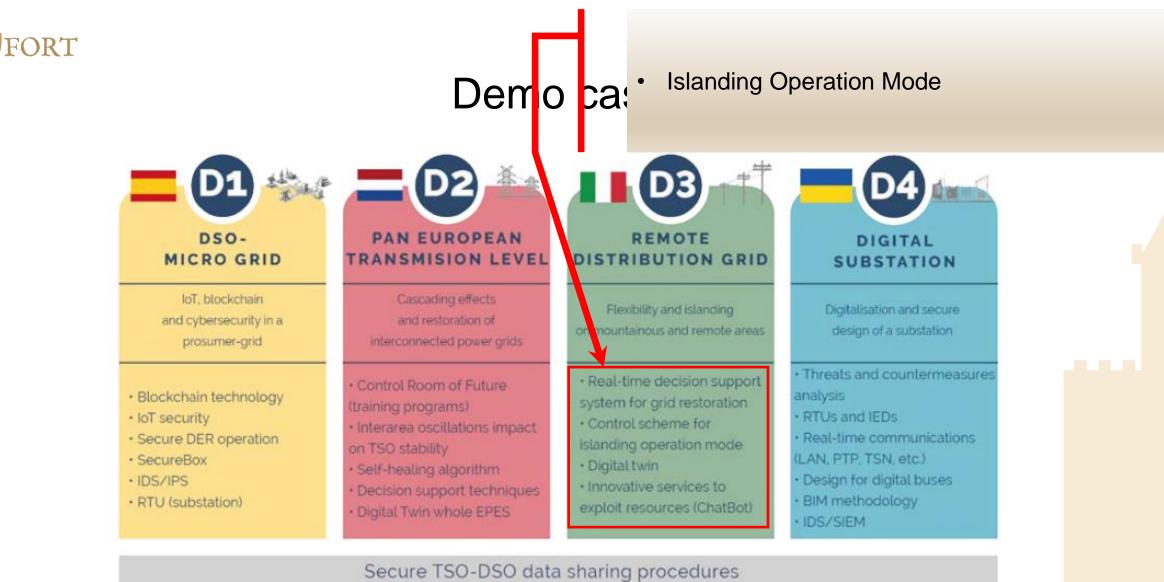
Page 9



Vulnerabilities database Interactive visualization tool

Dynamic risk assessment tools (cyber and physical)

Page 10



Vulnerabilities database Interactive visualization tool Dynamic risk assessment tools (cyber and physical)



Demo cases

IDS

Secure Design

•

•

DSO- MICRO GRID	PAN EUROPEAN TRANSMISION LEVEL	REMOTE DISTRIBUTION GRID	DIGITAL SUBSTATION
loT, blockchain and cybersecurity in a prosumer-grid	Cascading effects and restoration of interconnected power grids	Flexibility and islanding on mountainous and remote areas	Digitalisation and secure design of a substation
 Blockchain technology IoT security Secure DER operation SecureBox IDS/IPS RTU (substation) 	 Control Room of Future (training programs) Interarea oscillations impact on TSO stability Self-heating algorithm Decision support techniques Digital Twin whole EPES 	 Real-time decision support system for grid restoration Control scheme for islanding operation mode Digital twin Innovative services to exploit resources (ChatBot) 	 Threats and countermeasures analysis RTUs and IEDs Real-time communications (LAN, PTP, TSN, etc.) Design for digital buses BIM methodology IDS/SIEM

Secure TSO-DSO data sharing procedures Vulnerabilities database Interactive visualization tool Dynamic risk assessment tools (cyber and physical)





Thank you!

Conctac us: Esteban Gutiérrez Technical project leader: edgutierrez@fcirce.es

Visit and follow <u>www.efort-project.eu</u>





B eFORT project

This work has been Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.



This project has received funding from the European Union's Horizon Europe Energy Research and Innovation programme under Grant Agreement No. 101075665