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

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

eFORT

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

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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 →

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.

ZDNET

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

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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.

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The project in a nutshell

Programme
HORIZON
EUROPE

Total budget
~ 9 M€

Project Coordinator
CIRCE

Total partners
23 partners

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The project in a nutshell

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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

- **D4 – Iltsi (Ukraine)**
  - Substation secure operation and design
  - Digital SAS

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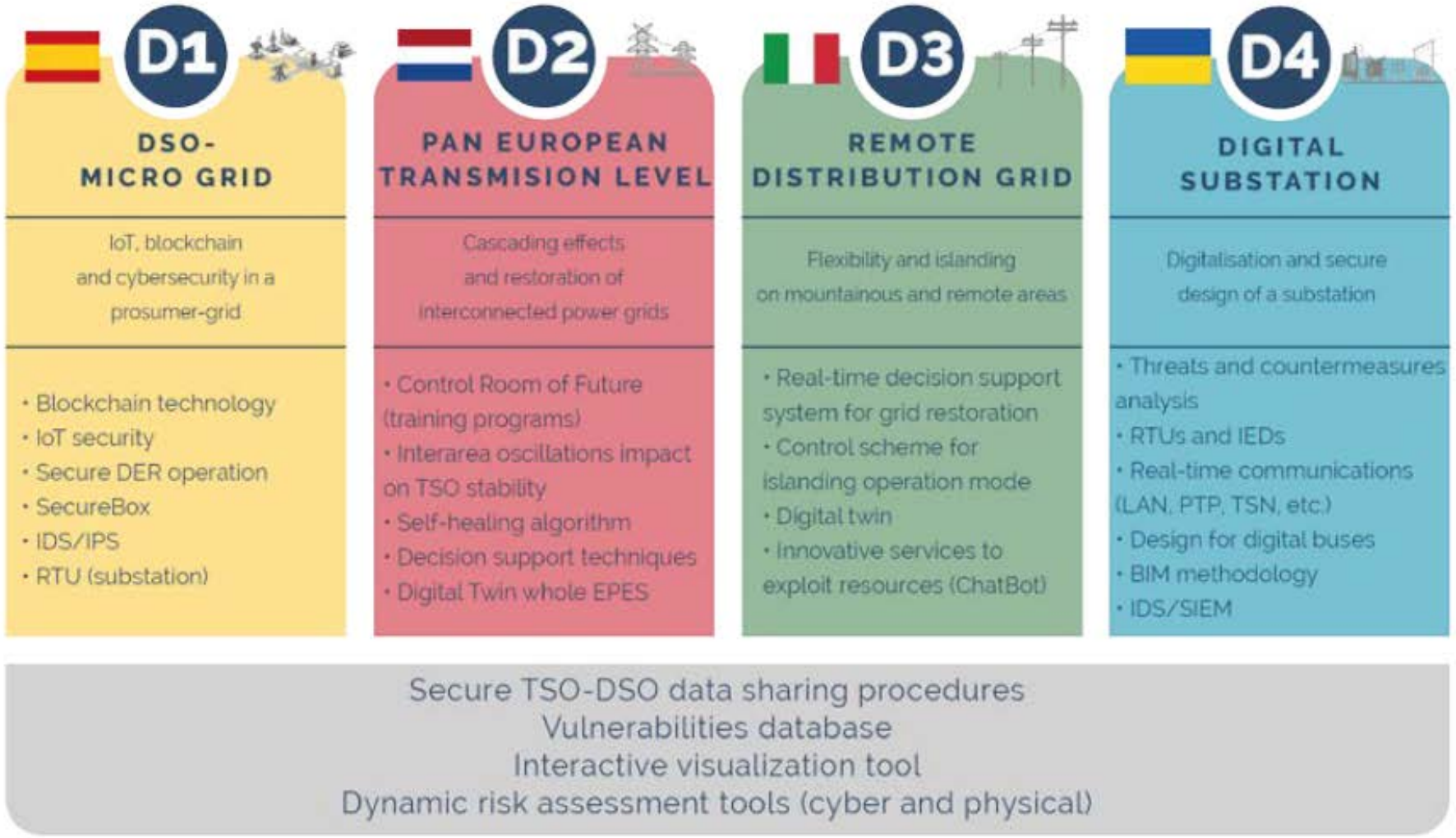
Demo cases



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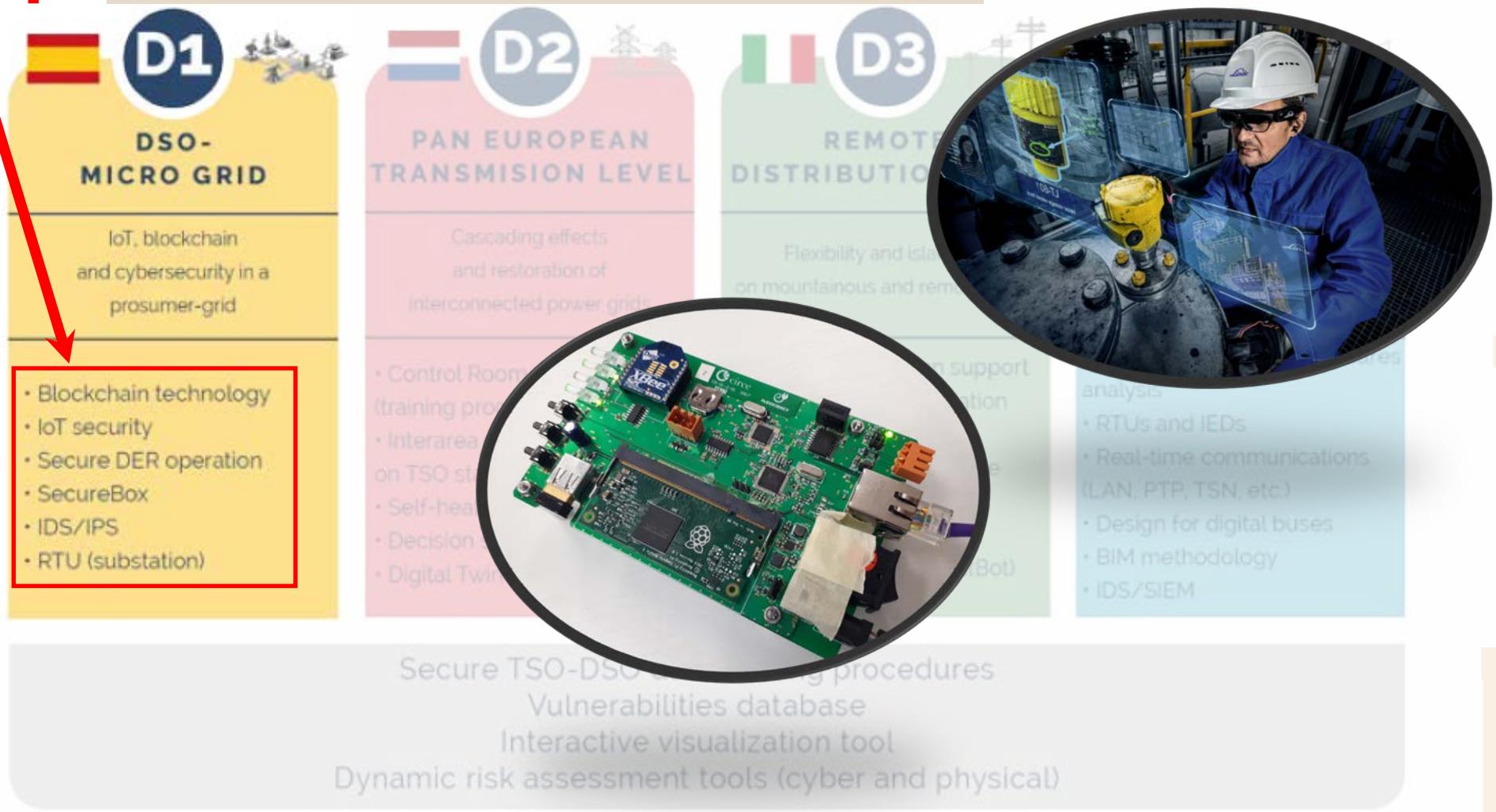
- Blockchain for grid resiliency and verification
- SecureBox



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- Control Room of the Future

D1

DSO-
MICRO GRID

IoT, blockchain
and cybersecurity in a
prosumer-grid

- Blockchain technology
- IoT security
- Secure DER operation
- SecureBox
- IDS/IPS
- RTU (substation)

D2

PAN EUROPEAN
TRANSMISION LEVEL

Cascading effects
and restoration of
interconnected power grids

- Control Room of Future (training programs)
- Interarea oscillations impact on TSO stability
- Self-healing algorithm
- Decision support techniques
- Digital Twin whole EPES

D3

REMOTE
DISTRIBUTION

Flexibility and
on mountainous

- Real-time dec
system for grid
- Control scheme
islanding operation
- Digital twin
- Innovative services to
exploit resources (ChatBot)

- IDS/SIEM

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

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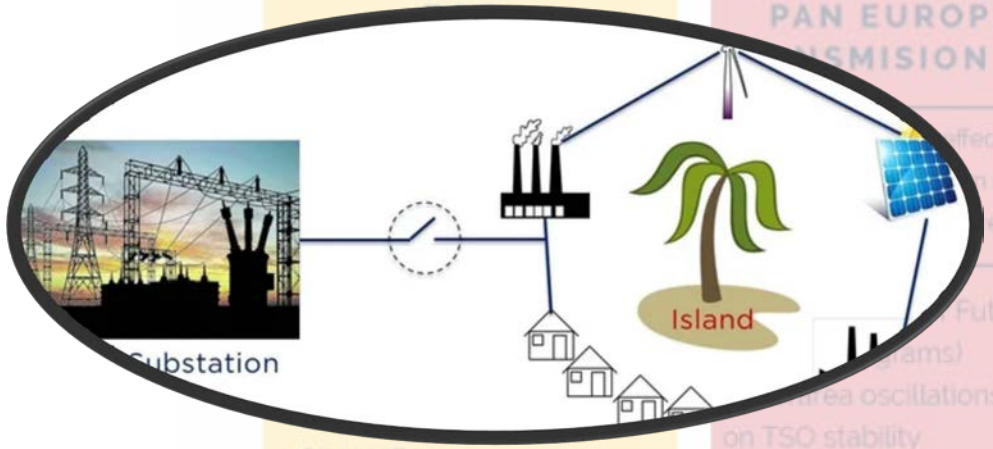
Demo cas

- Islanding Operation Mode



D1

- SecureBox
- IDS/IPS
- RTU (substation)

D2

PAN EUROPEAN
SMISION LEVEL

- Self-healing algorithm
- Decision support techniques
- Digital Twin whole EPES

D3

REMOTE
DISTRIBUTION GRID

Flexibility and islanding
mountainous and remote areas

- Real-time decision support system for grid restoration
- Control scheme for islanding operation mode
- Digital twin
- Innovative services to exploit resources (ChatBot)

D4

DIGITAL
SUBSTATION

Digitalisation and secure design of a substation

- 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)

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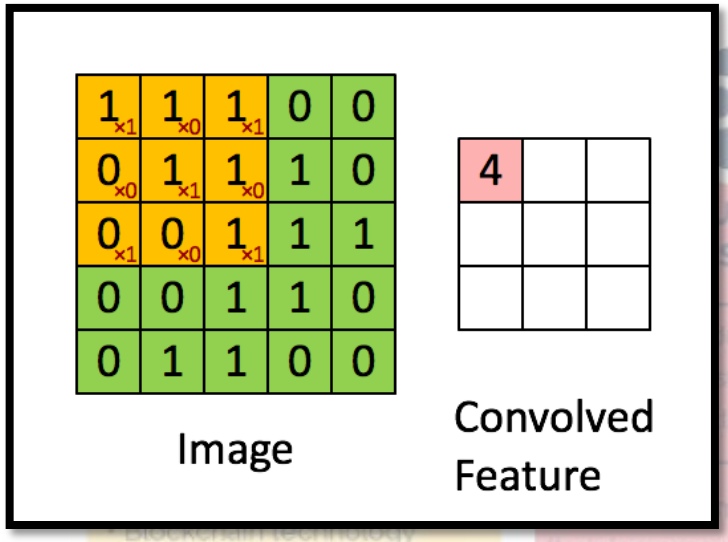
Demo cases

- IDS
- Secure Substation Design



D3

REMOTE DISTRIBUTION GRID

Flexibility and islanding on mountainous and remote areas

- Real-time decision support system for grid restoration

D4

DIGITAL SUBSTATION

Digitalisation and secure design of a substation

- Threats and countermeasures analysis
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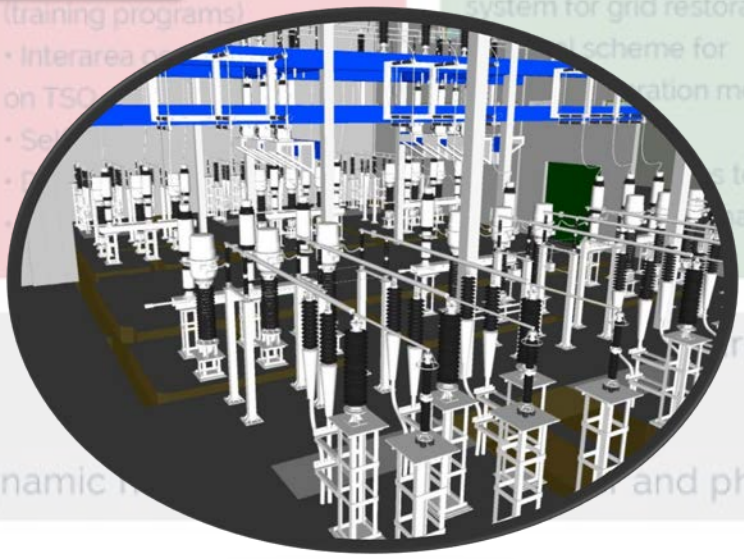

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Current status

What has been done?

- To characterize EPES involved within the scope of the project.
- To analyse the cybersecurity vulnerabilities in IoT devices and their impact on the grid
- To assess the effects at functional areas of cascading failures
- To identify and define the resilience actions for EPES
- To launch the different tools creation.

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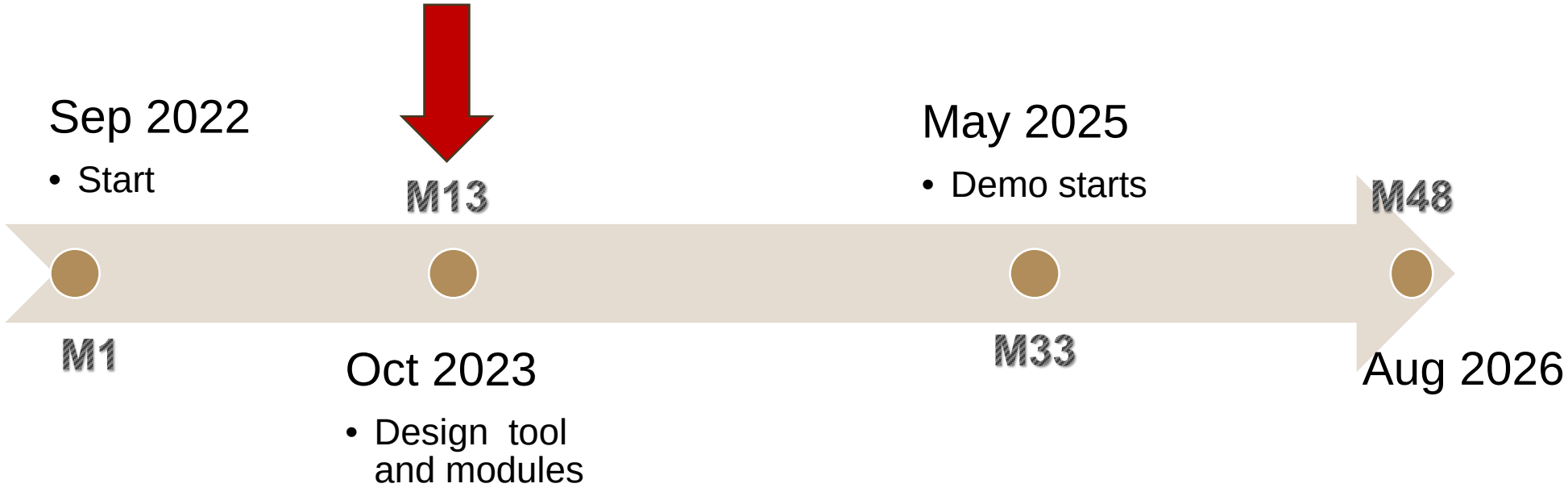
Current status



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Thank you!

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