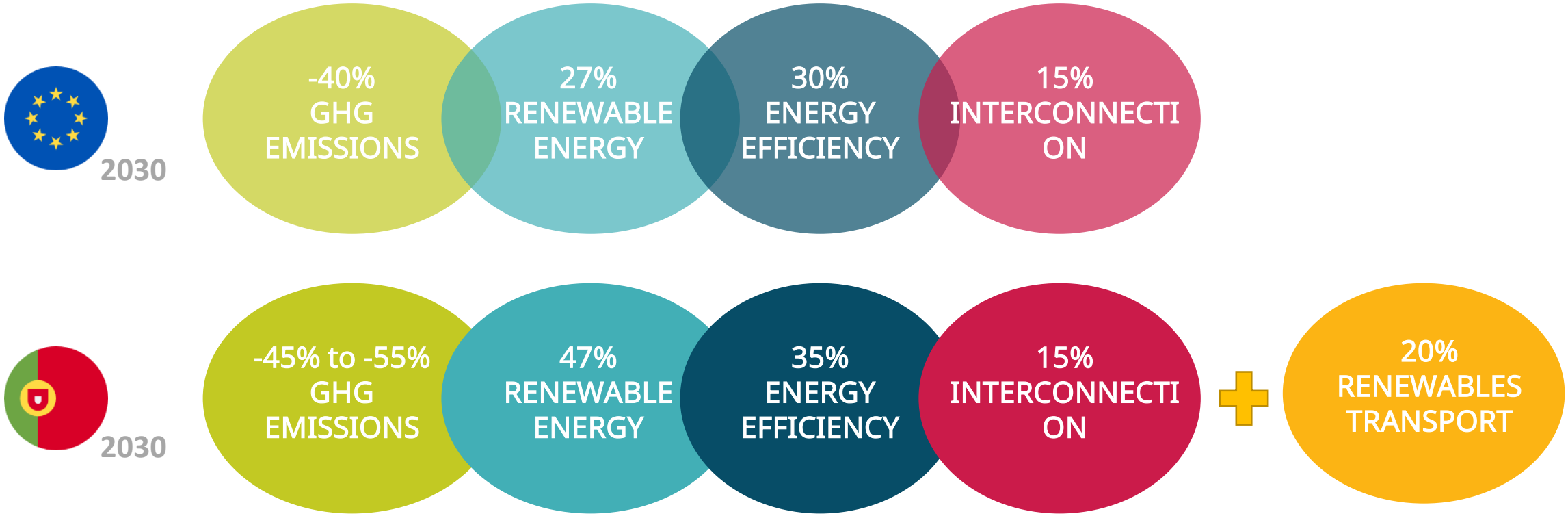
DSOs' roles to empower Cities becoming Smarter

João Torres, CEO of EDP Distribuição

DSOs as key enablers of the energy transition

Ambitious policy framework which needs a fit for purpose electricity system and energy market



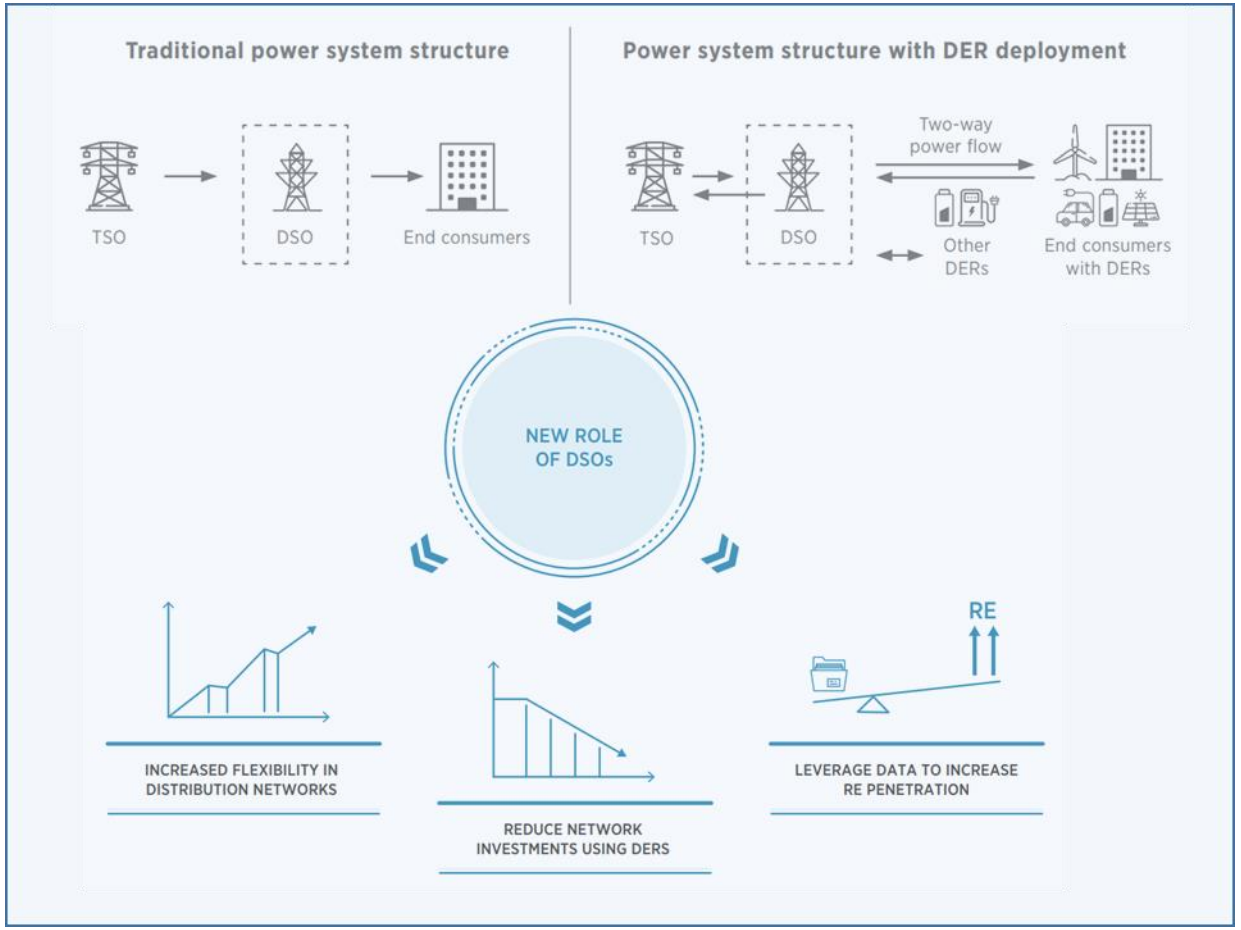
DSOs as key enablers of the energy transition

Evolving DSO framework supported by the Clean Energy Package

Three of the main aspects of the Clean Energy package, according to the European Commission

- DSOs to procure and use Flexibility
  - Integrating renewables and new loads requires innovative solutions and an appropriate regulatory framework
- Neutral market facilitator role of DSO
  - Specific rules for DSO involvement in storage, EV infrastructure and data management to maintain its neutrality
- DSO participation in the EU institutional framework and cooperation with TSOs
  - Establish a EU DSO entity with specific tasks and cooperation with TSOs in network operation and development

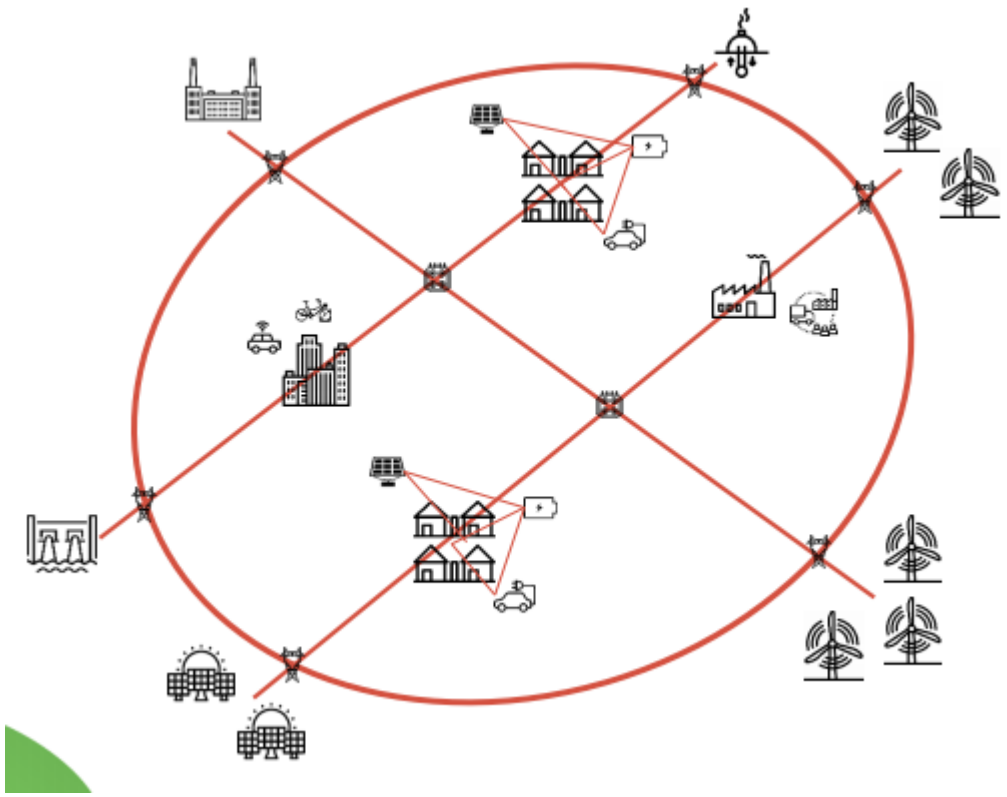
Source: EC, 2019



Adapted from: Future role of distribution system operators, IRENA, 2019

DSOs as key enablers of the energy transition

Vision of the Portuguese Government for electricity networks, following from the NECP



Main drivers

- Promoting smart and digital gris
- Rollout of smart meters
- Strong incentive to local/decentralised generation
- Active consumer participation in system related activities
- Adoption of flexibility solutions from both demand and supply

Source: Portuguese Government, January 2019

DSOs as key enablers of the energy transition

EDP's vision fully aligned with the challenges ahead

edp | OUR 2030 VISION

Leading the energy transition to create superior value

- Decarbonization
- Digitalization
- Decentralization

>90% renewables generation

Reduce 90% specific **emissions** (vs 2005 levels)

Become **coal-free**

>4 Mn decentralized solar PV panels installed

>1 Mn clients with e-mobility solutions

100% smart grids (in Iberia)

17

EDP is number 1 in the Dow Jones Sustainability Index World

Portugal runs on renewable power for the whole of March

Portugal has produced so much renewable electricity that it has outstripped the entire country's consumption for the month of March.

04 April 2018 | Adam Wentworth

Le Portugal, champion mondial des énergies renouvelables ?

DSOs as key enablers of the energy transition

Most recent developments in Portugal

DSO investment plan
(approved)

EDP Distribuição to invest 799 m€ by 2021 (3,8 b€ in the last 12 years) to continue modernisation and automation and keep reducing quality of service asymmetries

Regulation on Smart Grids/metering
(adopted)

Establishes the framework applicable to the provision of services supported by smart distribution grids, notably smart metering rollout and operation, and data handling

Regulation on (collective) self-consumption
(consultation closed)

Aims at fostering collective participation in the energy transition with DSOs to integrate DER, to support meter readings and to handle data

National plan to promote efficient energy consumption
(consultation open)

Revisioning of the rules of the national plan to promote efficient energy consumption (PNEC) to enhance results and benefits

Regulation on electric mobility
(consultation open)

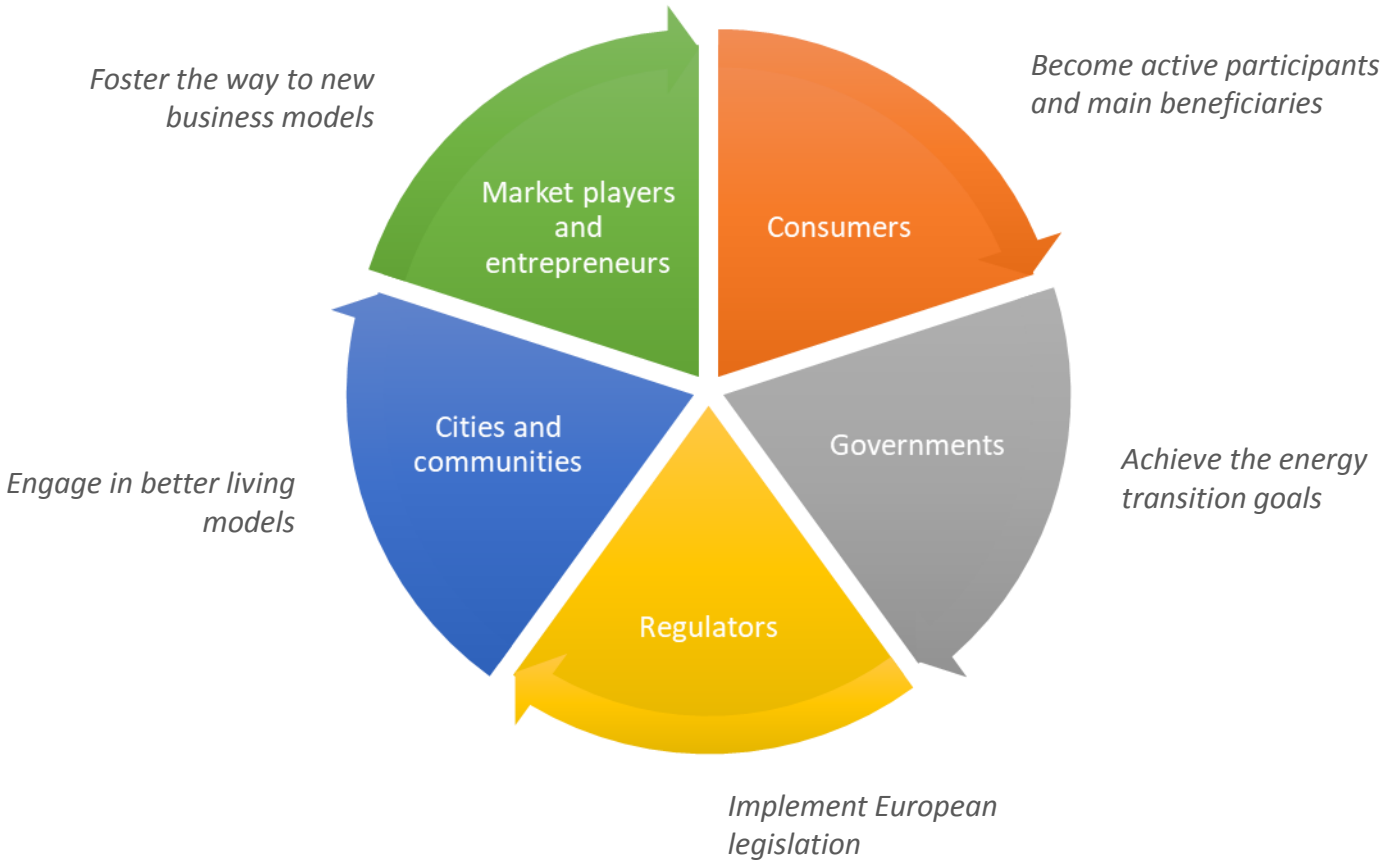
Revisioning of the operational procedures between the several entities engaged in the process, with the government aiming at +600k vehicles circulating by 2030

Extensive support to stakeholders' needs

Brief overview

Distribution system as an enabling platform

- Universal access, despite the variety of roles being played by the users (consumer, prosumer, electric vehicles, storage, …)
- (Cyber)secure, reliable and critical infrastructure that operates for the benefit of society as a whole
- Integration of DER of distinct nature and associated to more dynamic behaviours
- Vast majority of RES connected to distribution networks
- Key enabler to unlock value and for the uptake of innovative solutions and new market services
- Cost-effective support to the energy transition

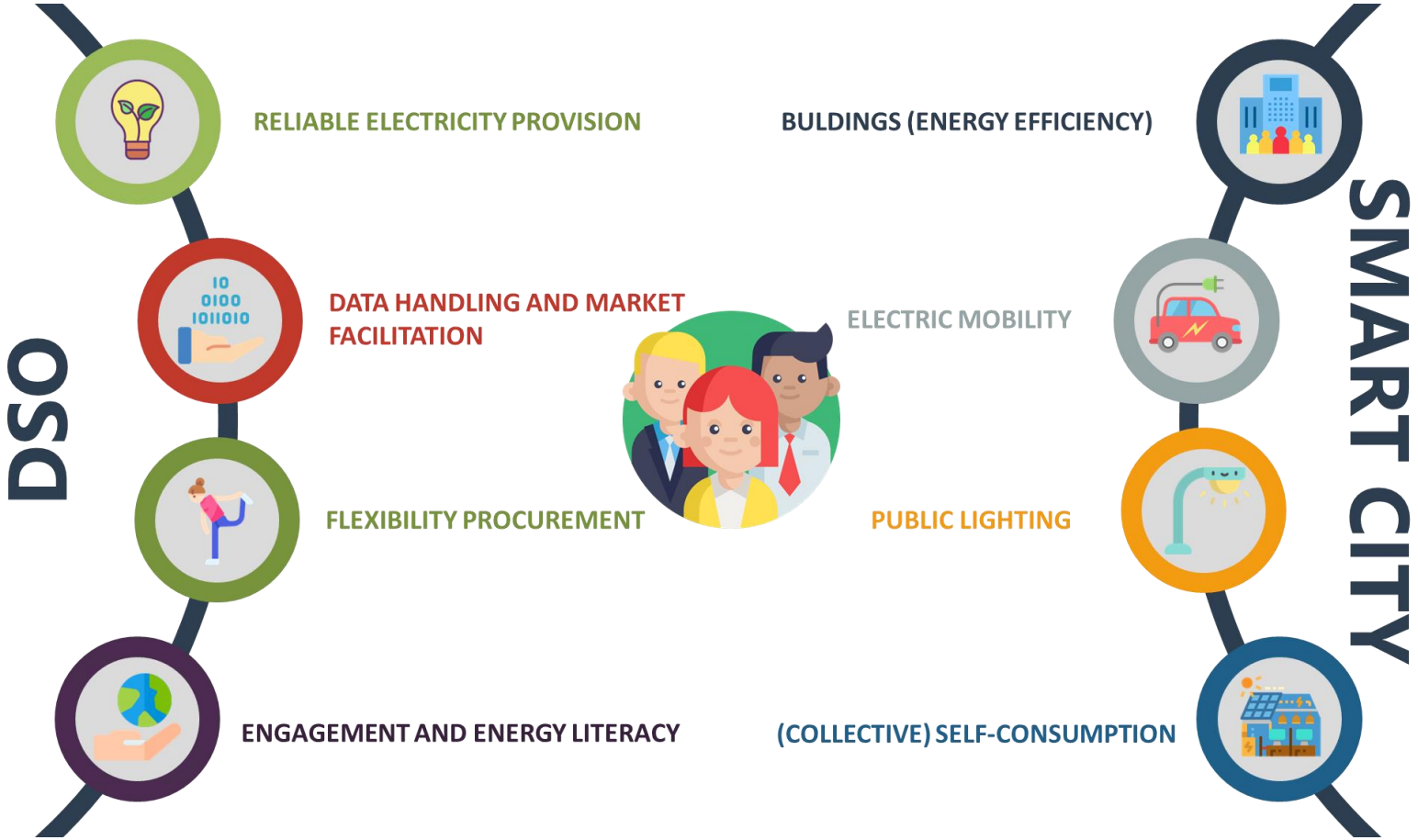


Extensive support to stakeholders' needs

The case for cities and grids

Fostering cooperation to manage the energy transition

- Europe needs digitalised fully deployed interconnected smart grids
- Cities are facing structural changes and urged to host smarter and sustainable advanced technologies to deliver electricity
- DSOs are key to ensure this task, in updating, improving and modernising electric grids they manage and in making use of electric power smarter and easier
- Further to this, DSOs shall be seen as catalysers of services by being neutral but fully active players

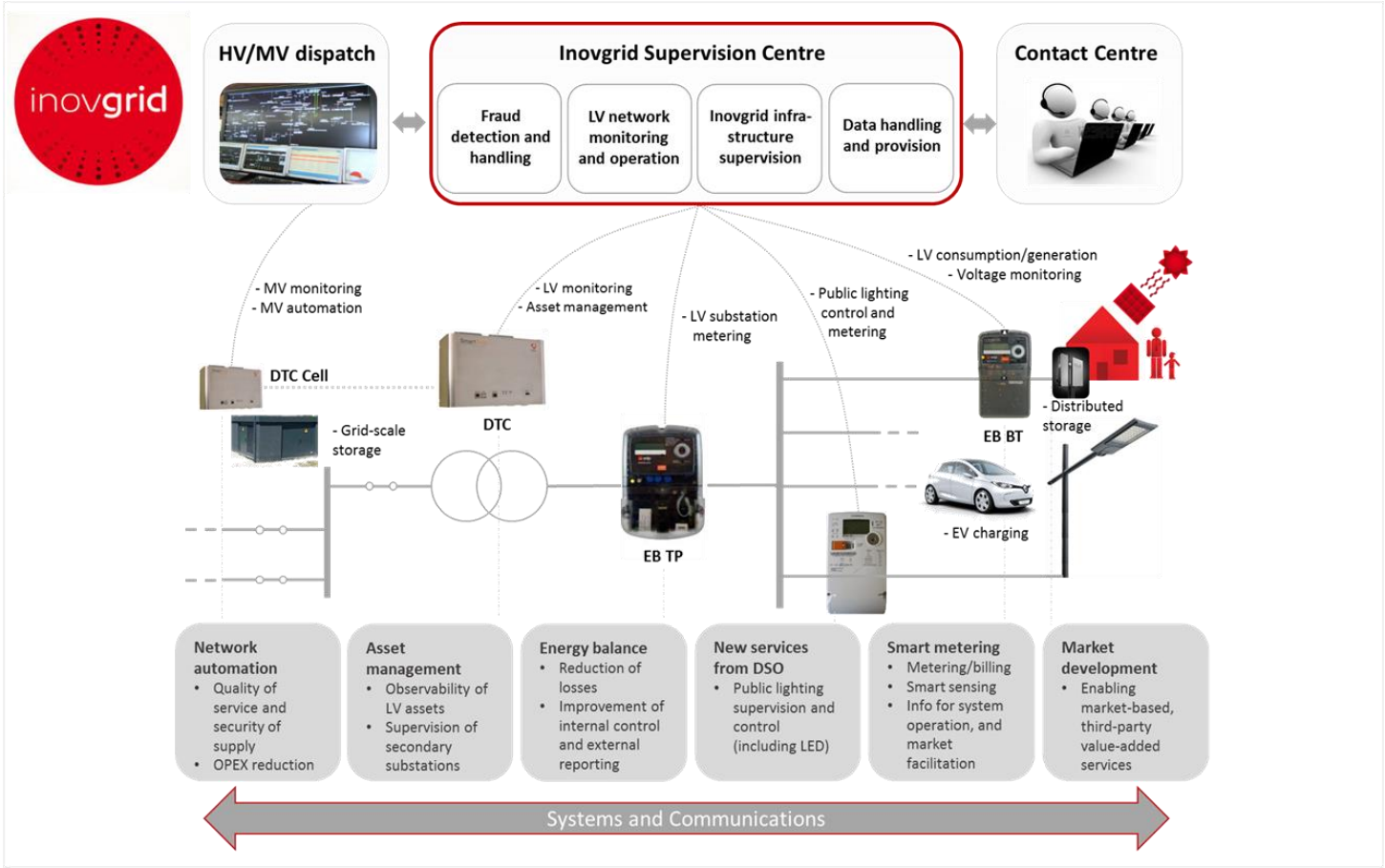


Need for an innovative toolbox of smarter and digital solutions

Inovgrid, a comprehensive initiative to make grids smarter and digital to touch upon each and every citizen

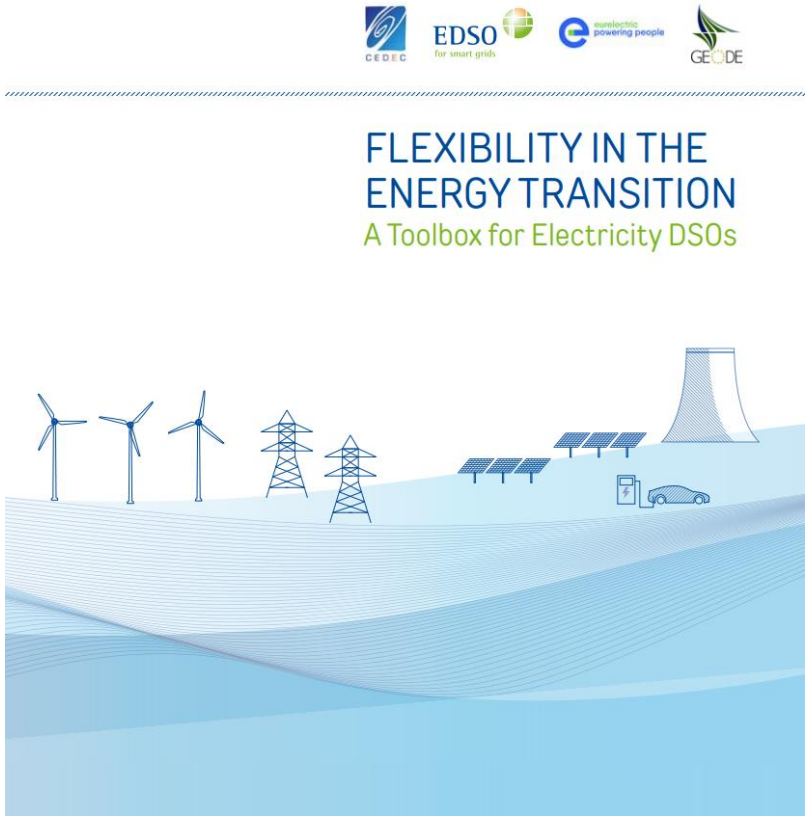
Rollout progressing very well with more than 40% of the devices already in place

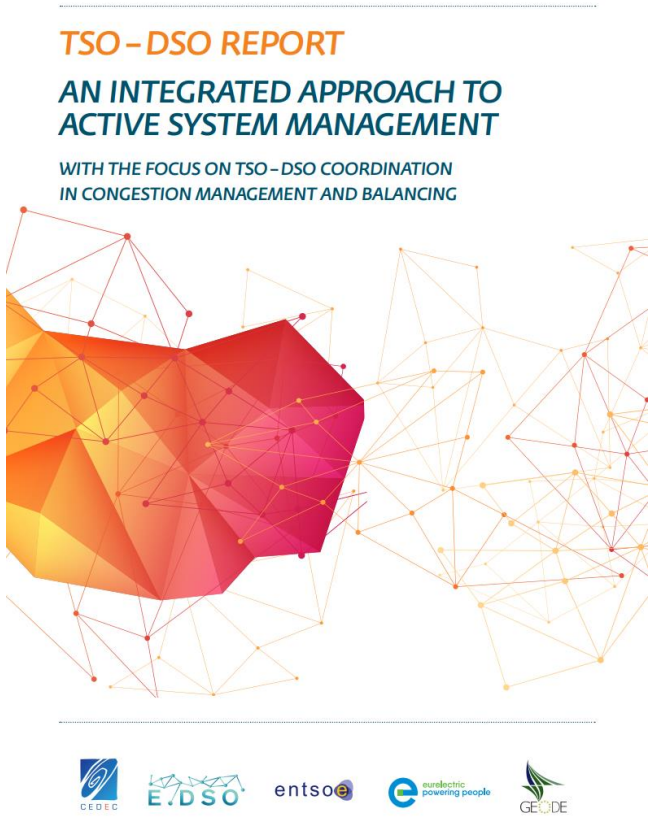
- +2,4 m smart meters installed
- +21,5 k DTC
- +91% already fully integrated in the smart grid system
  - despite less than 60% in networks with more than 90% of smart meters already installed
- Full coverage of public lighting, SMEs and industrial consumers



Need for an innovative toolbox of smarter and digital solutions

Active system management and flexibility procurement



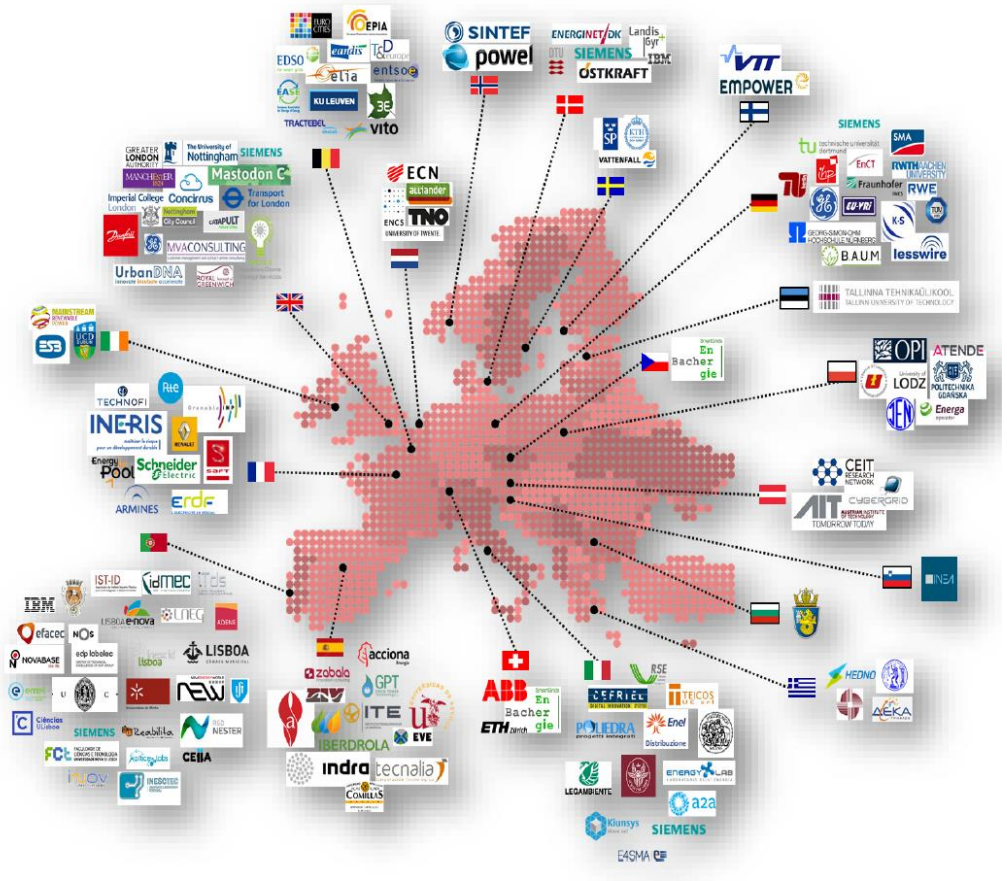


Need for an innovative toolbox of smarter and digital solutions

State-of-the-art and innovative experiments

An extensive portfolio of European funded projects

- 28 projects so far (9 active)
  - 4 with a major focus on Smart Cities
- +270 m€ projects' budget
- +280 partnerships
- +45 different countries
- Several distinct topics
  - Smart grids
  - Smart meters
  - Smart Cities
  - Active System Management
  - Data provisioning
  - Flexibility
  - Consumer engagement
  - ICT, AI, Blockchain, …



Final takeaway

In the new energy system …

Is absolutely key to involve DSOs from the very beginning