



# **FutuRed - XV Asamblea General**

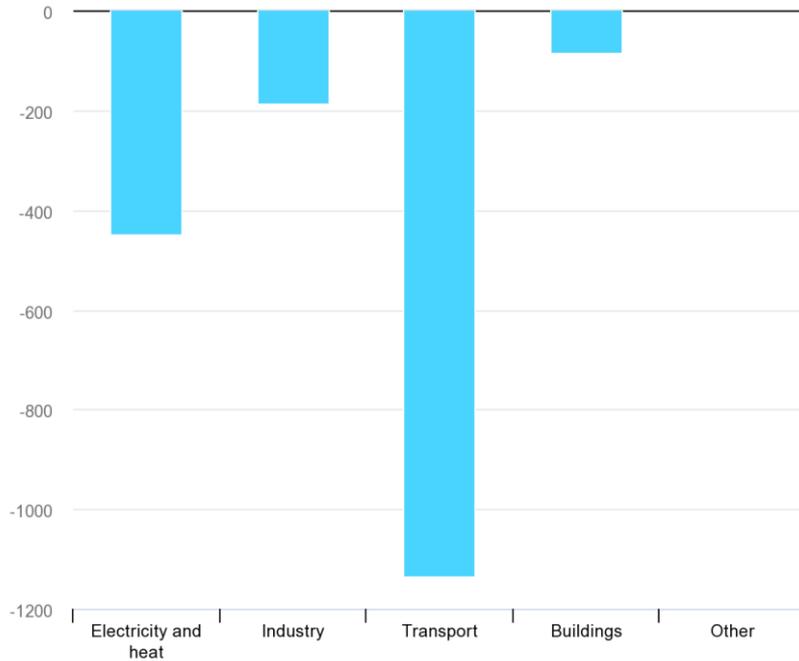
Ponencia Magistral: coyuntura actual y futuro energético  
hacia la neutralidad climática

Emi Bertoli, Division de Eficiencia Energética

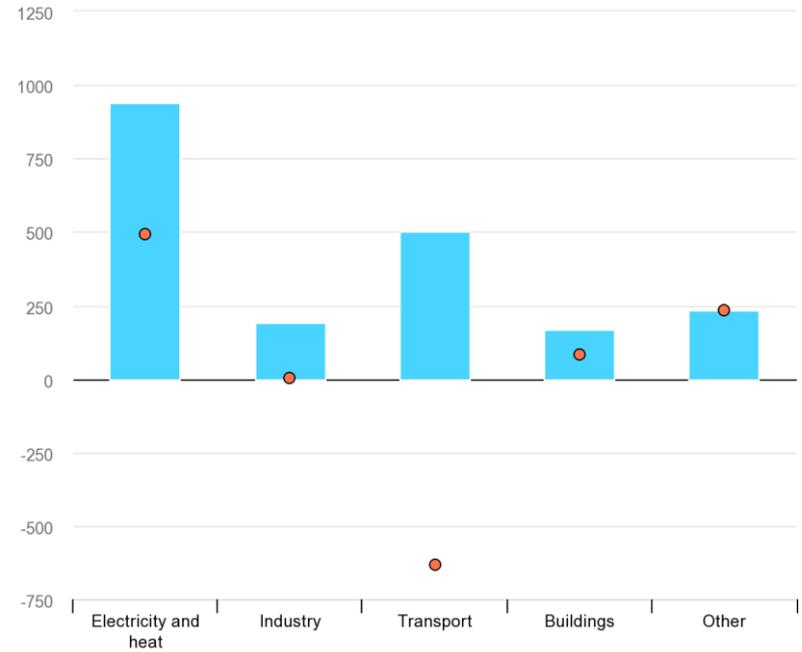
6 julio 2022

# Emissions from the world's power plants reached their highest ever level

Annual change in CO2 emissions by sector, 2020



Annual change in CO2 emissions by sector, 2019 - 2021



**46% of the global increase in emissions took place in electricity and heat production, since the use of all fossil fuels increased to help meet electricity demand growth**

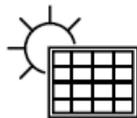
# A 10-Point Plan to reduce the EU's Reliance on Russian Natural Gas

## Action 1



**No new gas supply contracts with Russia**

## Action 4



**Accelerate the deployment of new wind and solar projects**

## Action 7



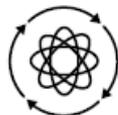
**Speed up the replacement of gas boilers with heat pumps**

## Action 2



**Replace Russian supplies with gas from alternative sources**

## Action 5



**Maximise generation from existing dispatchable low-emissions sources: bioenergy and nuclear**

## Action 8



**Accelerate energy efficiency improvements in buildings and industry**

## Action 9



**Encourage a temporary thermostat adjustment by consumers**

## Action 3



**Introduce minimum gas storage obligations to enhance market resilience**

## Action 6



**Enact short-term measures to shelter vulnerable electricity consumers from high prices**

## Action 10



**Step up efforts to diversify and decarbonise sources of power system flexibility**

# Net zero – massive ramp up of scale and scope

Digital is key for net zero pathways:

## Renewables – incl. distributed

- 100 million buildings with residential PV by 2030

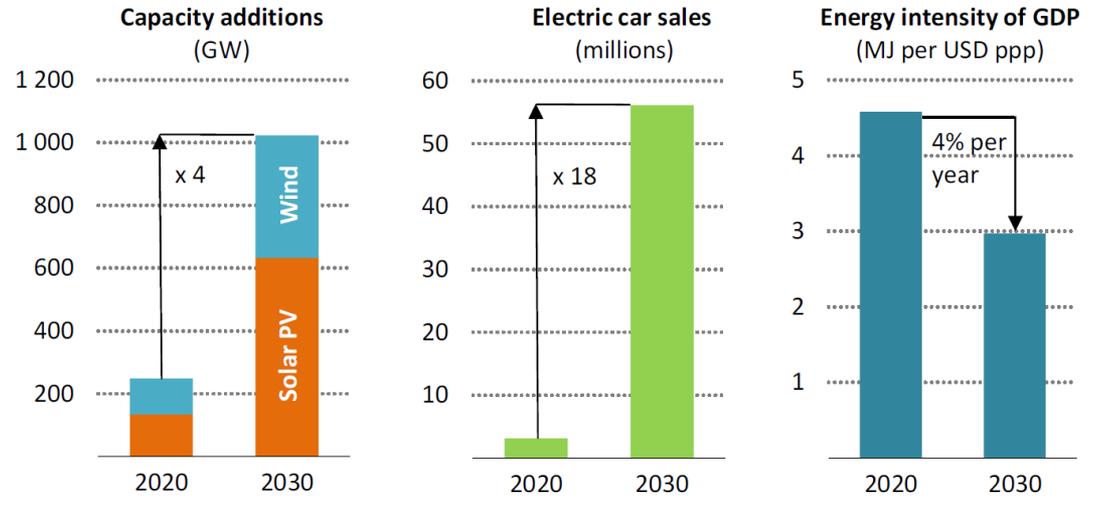
## Electrification & access

- 600 million heat pumps in NZE by 2030

## Reducing demand & making it flexible

- 85% of buildings to comply with zero-carbon-ready building energy codes by 2050

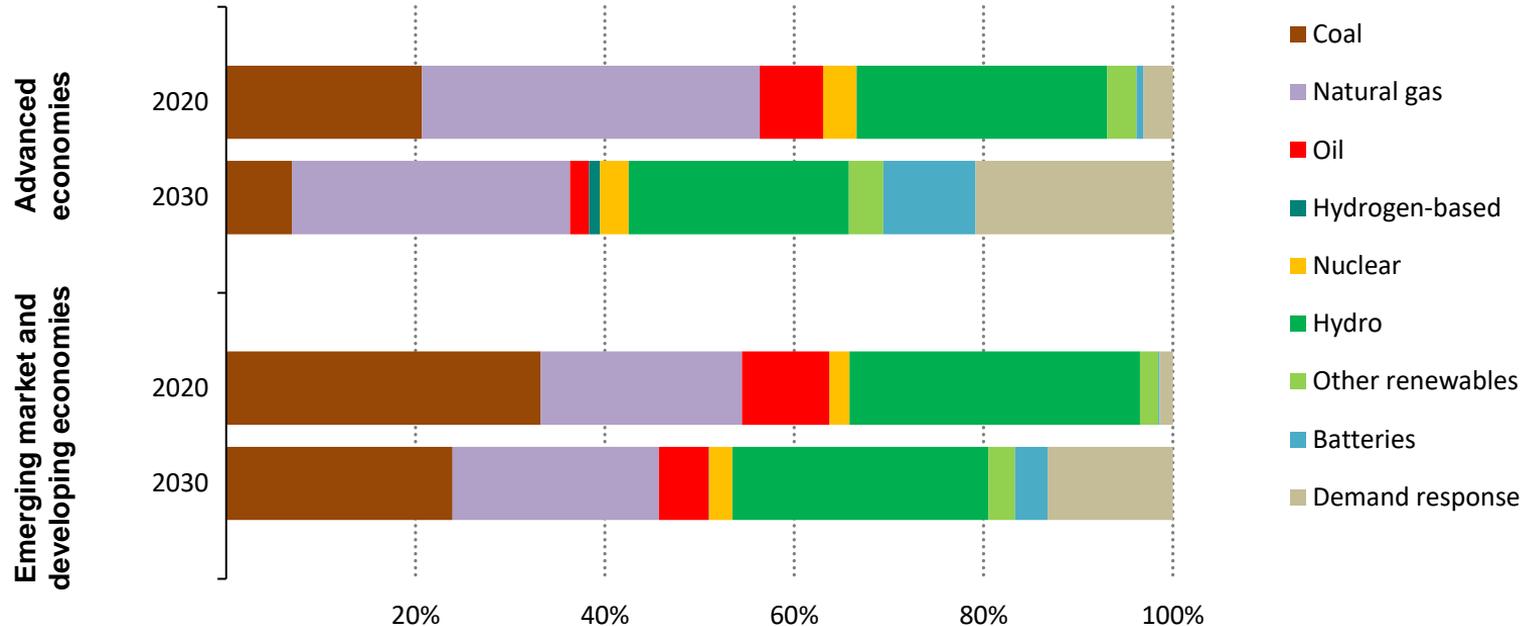
## Key clean technologies ramp up by 2030 in the net zero pathway



Note: MJ = megajoules; GDP = gross domestic product in purchasing power parity.

# Demand-side flexibility is key for climate, stability & security

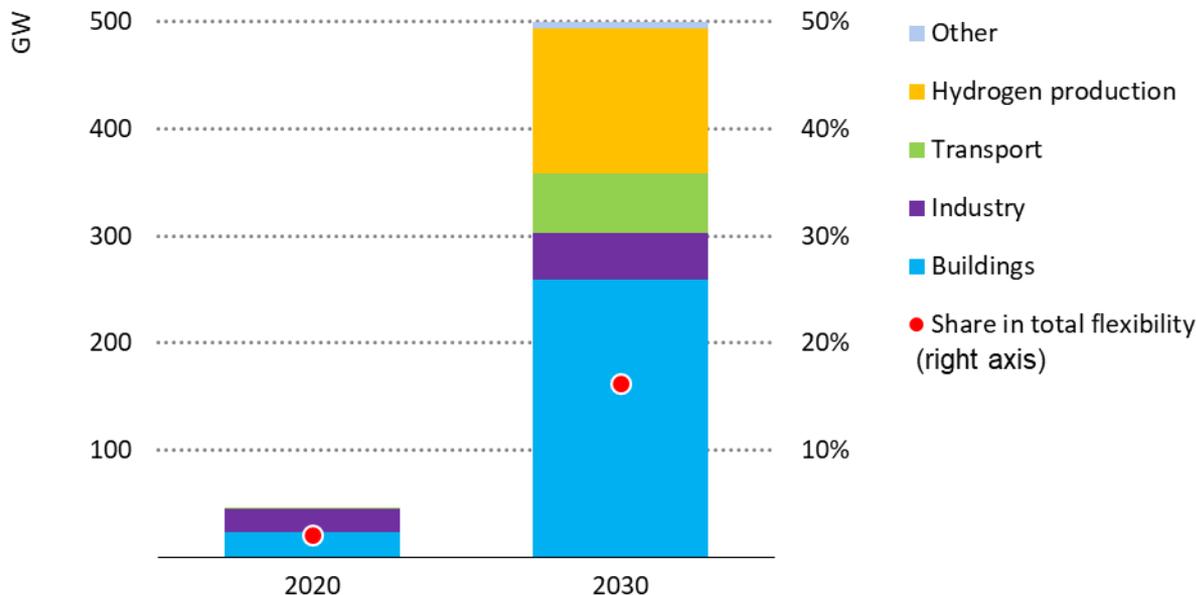
Electricity system flexibility source in the NZE



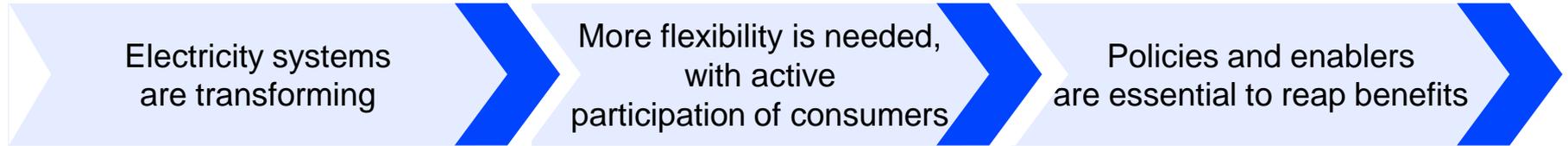
As power production shifts away from coal and gas, new sources of batteries and demand-response need to ramp up

# However more has to be done to be in line with NZE

Demand response availability at times of highest flexibility needs and share in total flexibility provision in the Net Zero Scenario, 2020 and 2030



**500 GW of demand response should be brought onto the market by 2030 to meet the pace of expansion required in the Net Zero Emissions by 2050 Scenario (NZE), a tenfold increase on deployment levels in 2020.**



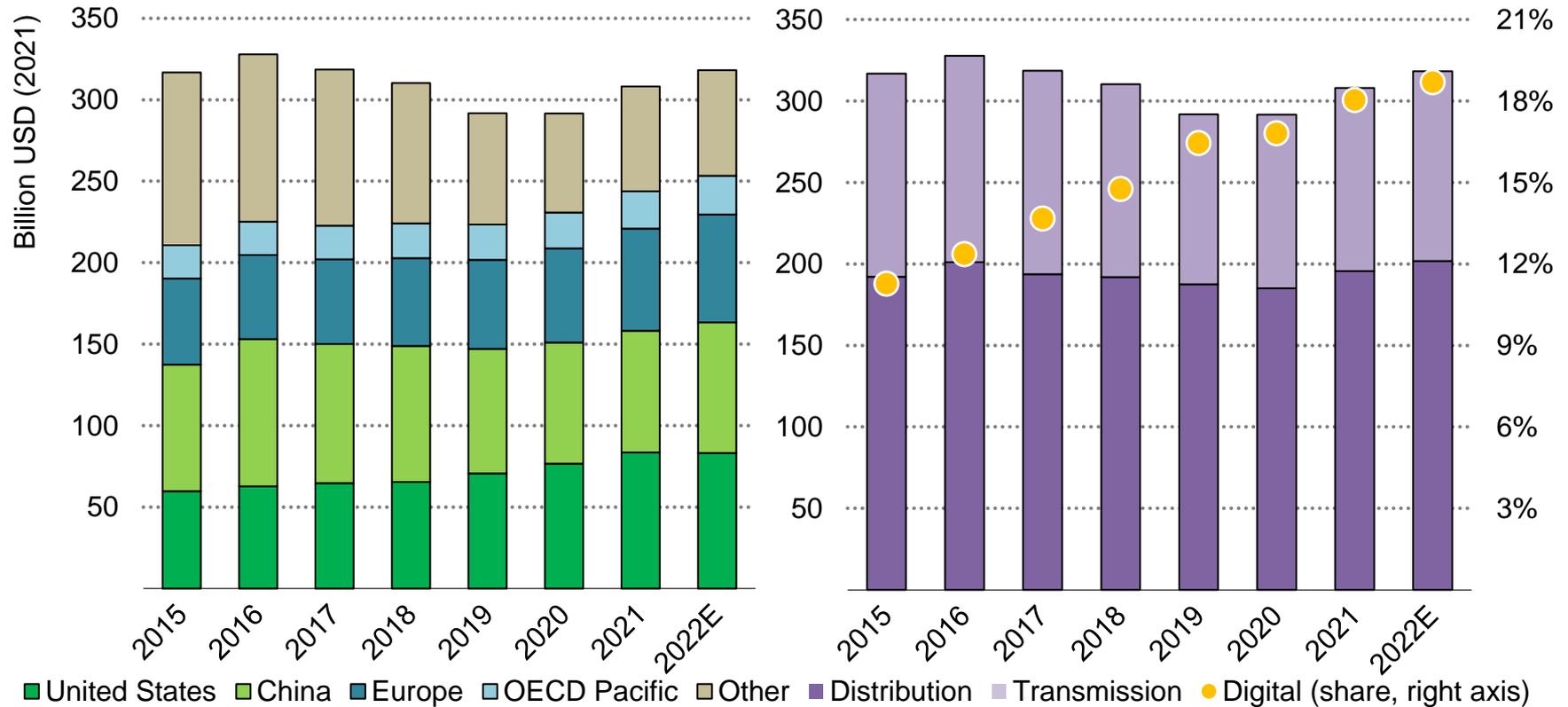
- **Digitalisation** can help leverage opportunities:
  - Create a more interconnected and responsive electricity system
  - Support carbon emissions reduction
  - Help to minimise system cost and need for new investment
  - Improve stability, resilience and security
  - Enhance quality of power supply

**Implementing right policies, digital technologies and new business models is key to enable transformation**

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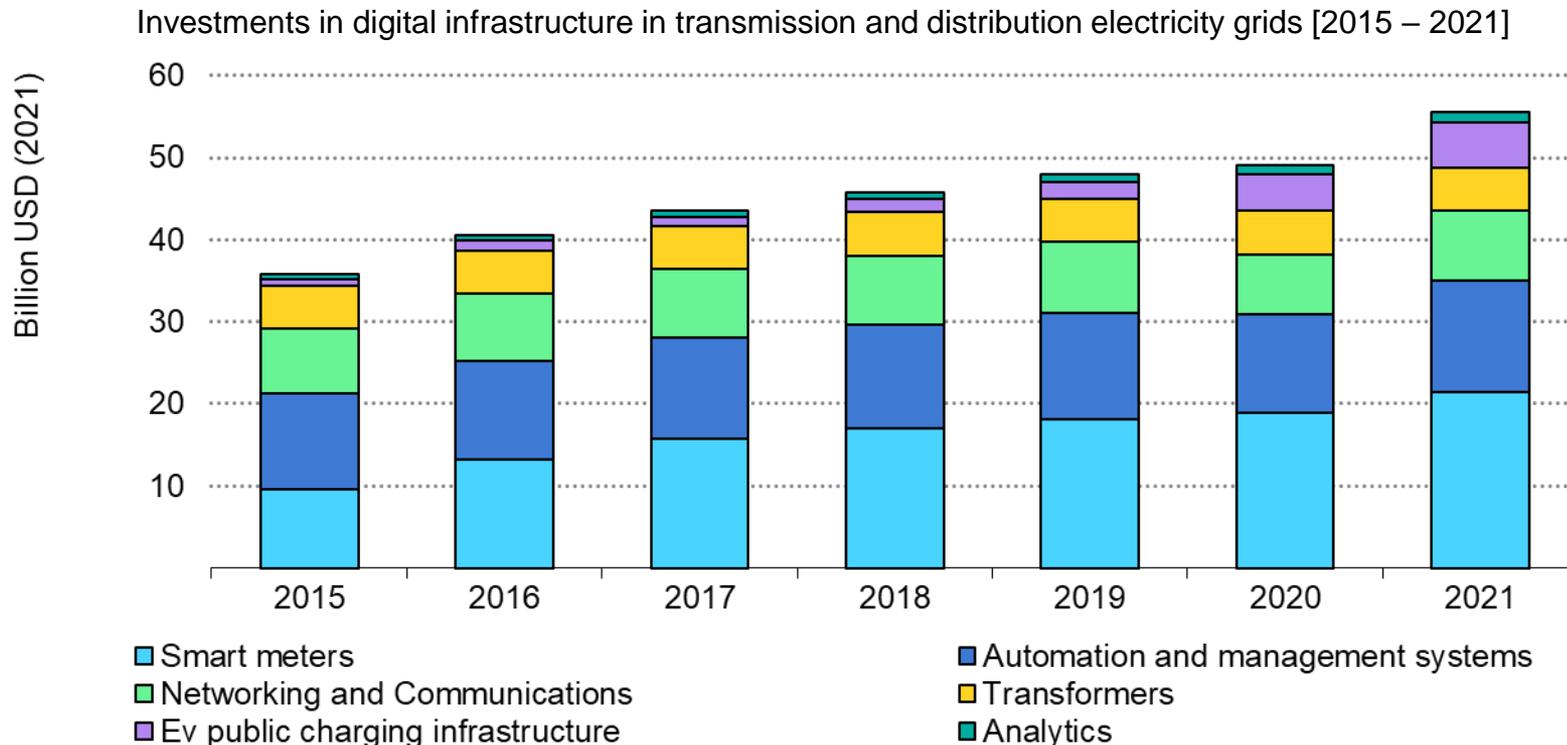
# Investment in grids is recovering, particularly in advanced economies

Investment in electricity networks by geography (left) and segment (right)



Source: IEA analysis based on Guidehouse (2022).  
IEA 2022. All rights reserved.

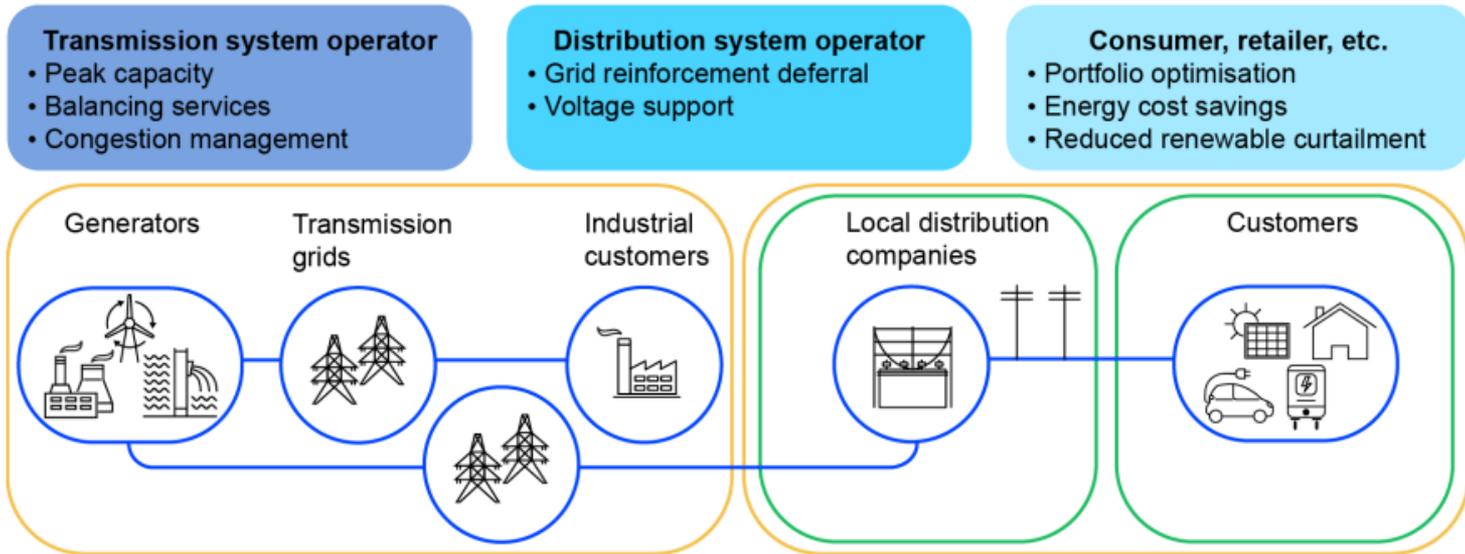
# Investment in smart meters and automation are leading the way

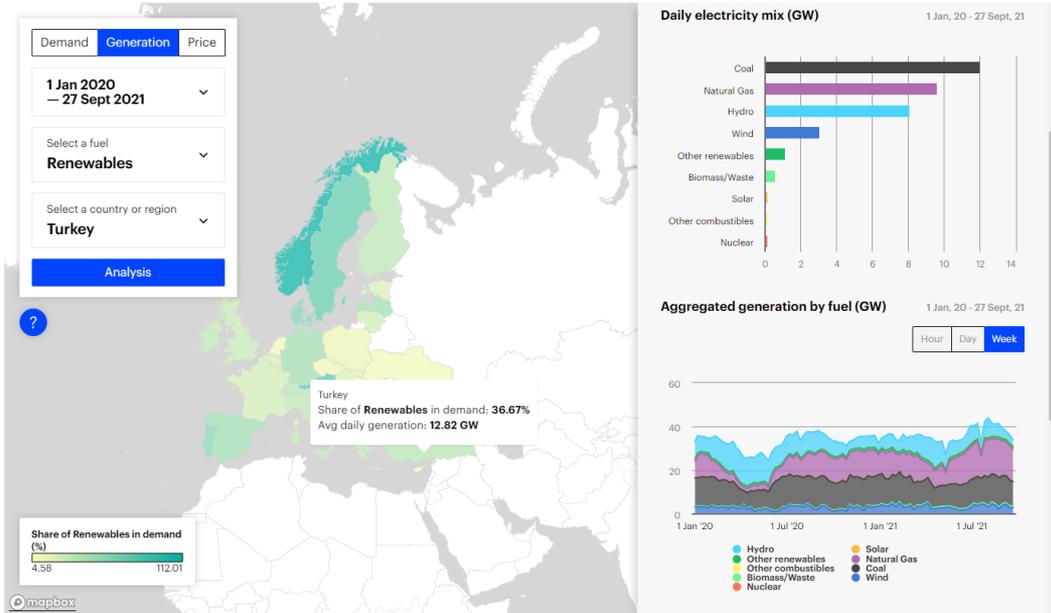


Source: IEA analysis based on Guidehouse (2022).

**Investment in public EV charging infrastructure continued increased by more than 20% in 2021, however, it still comprises less than 5% of total distribution investment.**

# Smart charging can provide services along the power supply chain





<https://www.iea.org/reports/real-time-electricity-tracker>

3 meaningful stories:

Impact of **Covid-19** in one of the most hit country: **Peru**

**Weather shocks:** the example of the **Texan** cold snap

Market turmoil: Surge in **Prices** all over **Europe**



## Responding to member countries in a timely manner

- Reacting in a timely manner to “shocks” (Covid, market turmoil, extreme weather events,...) with in depth analysis backed by in-house real-time data
- Tracking the Energy Transition with the shortest lag – “leading indicators”
- Making sure our scenarios have the most accurate starting points



## Bringing Data Science skills into the IEA

- Machine learning for nowcasting and error detection
- Big data for larger datasets
- Data engineering to master and handle databases
- Natural language processing for text analysis
- Geospatial data analysis
- Image recognition (e.g. satellites)



## Generating new ways of working and new data products

- Automating repetitive and error prone tasks
- Keeping data in one place in the IEA’s “data warehouse”
- Generating more data products related to the people-centered transition
- Delivering interactive data visuals to make data more meaningful
- Developing new indicators (e.g. exploiting greater periodicity)

- **Aim of the Project** - providing **actionable guidance** to policy makers on the policy, regulatory, technology and investment context needed to accelerate progress on **power system decarbonisation and modernisation** and **effective utilisation of demand side resources**
- **Project timeline: 2020 - 2023**
- **Outputs**
  - **Policy guidance document** (release Q2 2023), tools and intermediate outputs, including articles and commentaries
  - Thematic and regional events and workshops
  - G20 Report “Empowering Cities toward Net Zero Emissions: Resilient, smart and sustainable cities towards a sustainable energy future”, released in July 2021
- **Global scope, geographic focus** including but not limited to **Brazil, Colombia, India, Indonesia, Morocco, South Africa, Tunisia, and Latin America, Africa, South East Asia** regions. Ongoing engagement with a **Consultative Group of Experts** (37 members from 14 countries)
- Italy / UNEP are supporting **pilot projects** that will be implemented **in 2022** to test new approaches on demand side and distributed energy resources in (1) Urban contexts, (2) Islanded systems, (3) Existing grid assets – **learnings will feed into 3DEN analysis.**
- Upcoming: **IEA-ISGAN workshop on flexibility for resilience (Paris, 3-4 October 2022)** - <https://www.iea.org/events/iea-and-isgan-workshop-flexibility-for-resilience-in-integrated-systems>

# ISGAN INTERNATIONAL SMART GRID ACTION NETWORK

AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

## MISSION

**Accelerate the development and deployment of smarter electricity grids worldwide, enabling increased demand response and energy efficiency.** It focuses on five principal areas: policy standards and regulation, finance and business models, technology system development, workforce skills and knowledge, user and consumer engagement.

## GOALS

ISGAN is an international platform for the development and exchange of knowledge and expertise on smarter, cleaner, and more flexible and resilient electricity grids (“Smart Grids”). ISGAN provides an important channel for the communication of experience, trends, lessons learned, and visions in support of global, national and regional clean energy objectives as well as new flexible and resilient solutions for Smart Grids.

## LEAD GOVERNMENTS



## COORDINATOR



## PARTICIPANTS

Australia, Brazil, Canada, China, Denmark, European Commission, Finland, France, Germany, Israel, Japan, Netherlands, Norway, Russia, South Africa, South Korea, Spain, Sweden, United Kingdom

## PARTNERS

European Technology and Innovation Platform Smart Networks for Energy Transition (ETIP SNET), Global Smart Energy Federation (GSEF), International Energy Agency (IEA), India Smart Grid Forum (ISGF), Mission Innovation (MI)



# Mission Innovation Green Powered Future Mission

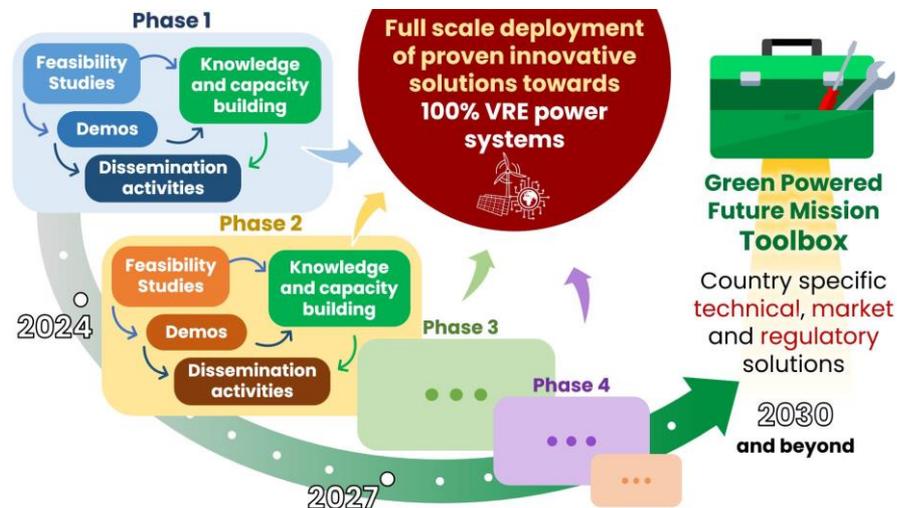


## Scope and objectives

The **Green Powered Future Mission** aims to demonstrate that **by 2030** power systems in different geographies and climates, are able to effectively integrate **up to 100% variable renewable energies**, like wind and solar, in their generation mix and maintain a cost-efficient, secure and resilient system.

## How?

- **Demonstrating** innovative technical solutions
- **Analysing** policy, market and regulatory aspects
- **Generating** the tools, data and networks needed to enable more people and areas to be powered by affordable and high-levels VRE



## Joint Roadmap of Global Innovation Priorities

- **Top 100 Global Innovation Priorities** with separate detailed descriptions
- Selection of most valuable **demo projects** to be developed on specific Innovation Priorities

# Thank you!

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