HEDNO’s role in the energy transition

IENE

26th National Energy Conference

Sophia Politopoulou

Director of Regulatory Affairs dpt HENDO

Vice Chair Strategic Advisor Committee EU DSO entity

22 November 2022

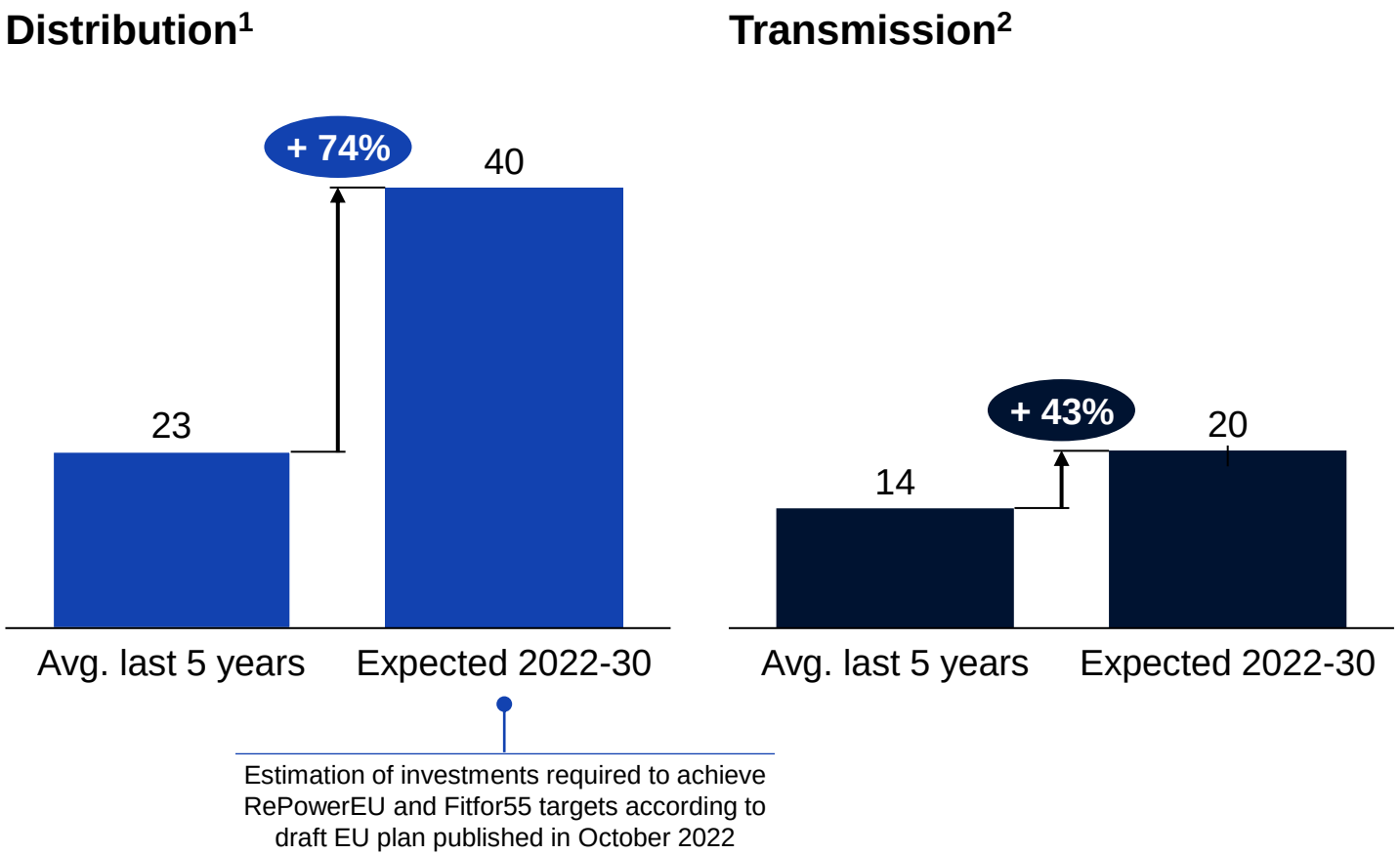
Europe through a series of policies and frameworks has set tangible targets by 2030 and 2050

		Targets (not exhaustive)			
Policy / Framework	**Description**	**GHG**	**RES**	**Electrification (incl. EVs)**	**Other**
Paris Agreement	**First legally binding global climate deal** to **limit global warming to "well below 2C"** and pursue **efforts to limit the increase to 1.5C** versus pre-industrial levels	Net zero by by 2050			Each country ratifying the agreement to develop a nationally determined contribution (i.e., their post-2020 climate actions)
EU Green deal	Legislation aiming to **make Europe the first climate neutral continent by 2050**	55% by 2030 (vs. 2019) Net zero by 2050			Increase forest land, increase organic farming, reduce fertilizer, etc.
EU Fit for 55	Package of **12 interconnected proposals to ensure that the EU is ready to achieve its climate targets** of reducing GHG emissions by at least 55% by 2030 (vs. 1990)		45% penetration of RES by 2030	20% penetration of residential heat pumps by 2030 20% penetration of EVs by 2030	
REPowerEU	**Response to energy crisis caused by Russia's invasion in Ukraine**, with targets on energy efficiency and RES increase as well as eliminate dependency on Russian fossil fuels		+600 GW of solar by 2030	3x heat pumps vs. 2022 (~40m units) by 2030	13% energy efficiency by 2030

Source: Policies / Framework / Legal documents

To achieve these targets, there is a need for a massive increase in the investment on grids, primarily in distribution

Annual EU-27+ UK investment in power grids, EUR bn



Underlying drivers

Increased **electrification of consumption** requires on-time asset upgrades (e.g., transformers, cables)

Grid modernization requires large investments to ensure granular control of load and grid and improve quality

Integration/management of **distributed flexibility resources**

Changing generation footprint and flows require expansion to help reduce congestions

Interconnection increases

Increased **connection requests from RES** require on-time processing

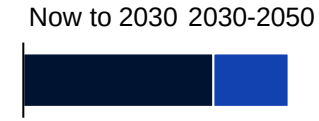
1.Avg. last year data from Eurelectric (DSO association); 2022-2030: Digitalizing the energy system – EU Action plan
2.Data from GTR report including offshore connections, onshore grid build-out and interconnectors

Source: DSOs and national associations; Monitor Deloitte & Euroelectric: Connecting the dots: Distribution grid investment to power the energy transition IEA; GTR report (2021)

Greece has cascaded EU's policies to a national level, and has also recently passed a national climate law

		Targets (not exhaustive)			
Policy / Framework	**Description**	**GHG**	**RES**	**Electrification (incl. EVs)**	**Other**
Greek NECP and long-term strategy ***NECP under revision; Updated NECP expected in 2023***	**Greece's national energy and climate plan**, including a detailed roadmap and a long-term strategy for 2050	**74%** by 2030 for ETS companies (vs. 2025) and **56%** for other companies **Net zero** by 2050	13.1 GW (**60%** in consump.) by 2030 Lignite **phase off** by 2028	**30%** of new vehicles must be EVs by 2030	Improved energy efficiency by **38%**
NRRP Greece 2.0	Plan to make the **Greek economy more extroverted, competitive, green and digital**;				Includes funds of EUR ~31 billion to be distributed along 4 major pillars (incl. accelerating the green transition)
National climate law	**Greek climate law published in 2022**	Companies required to report GHG emissions and decarbonization actions (from 2024); Need to achieve 30% reduction by 2030 (vs. 2019)	Lignite phase off by 2028	25% of company cars (from 2024) and 100% of taxis (from 2026) must be zero emissions; Since 2030 applies to all new cars Starting 2025 oil heaters are prohibited; Buildings >500sqm will require 30% energy coverage by RES (from 2023)	

For Greece to achieve its targets, six main decarbonization technologies can cover ~80% of emission reduction



~80%
of 2050 abatement

1. Electrification & renewables

Replace fossil fuels by electrification of energy demand; extra power provided by solar and wind energy in combination with energy storage

2. Battery electric technologies

Replace internal combustion engines with electric battery drivetrains, primarily for transport applications

3. Sustainable hydrogen

Substitute fossil fuels as a heat and/or feedstock by blue and green hydrogen and hydrogen derivatives (e.g., ammonia, synfuels) in industry, transport and buildings

4. Nature based solutions

Adjust land use and forestry to increase carbon absorption to create larger 'nature-based carbon sinks'

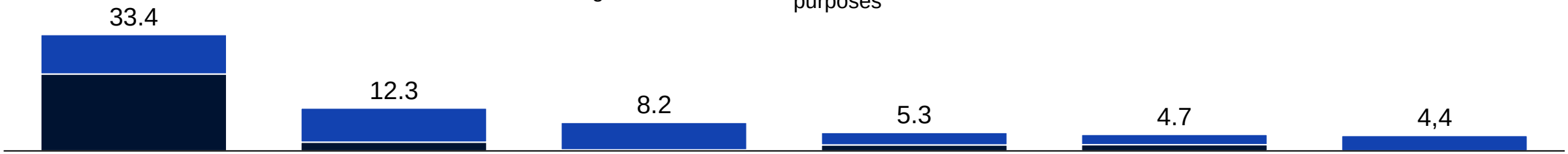
In addition, biomass can be produced for biofuel purposes

5. Energy efficiency

Improve energy efficiency of equipment and processes to reduce fuel needs and reduce emissions

6. Carbon capture and storage

Decarbonize industrial emission by capturing energy and process related CO2 streams e.g., starting in ammonia and refining, and later expanding into cement



Source: McKinsey net zero Greece

Within this European and Greek context, HEDNO will have a dual role to play

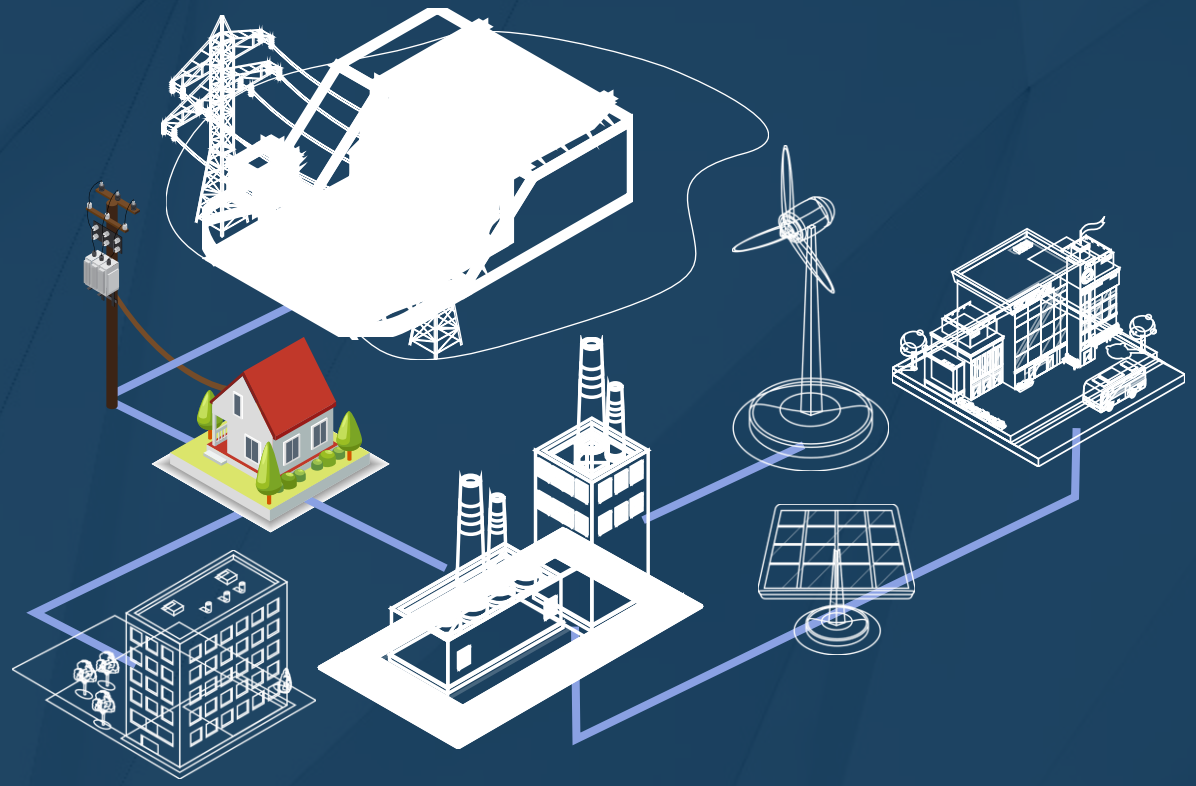
HEDNO as an enabler for the Greek ecosystem

HEDNO has a key role in enabling the energy transition of all stakeholders in the Greek ecosystem, via the integration of renewable generation capacity and flexibility resources as well as supporting electrification of the economy

focus of today's discussion

HEDNO's own sustainability journey

HEDNO is contributing to the decarbonization of Europe by reducing and limiting the GHG emissions generated by its own activities and value chain



To enable the energy transition of the Greek ecosystem, there are 4 main trends that HEDNO will take into account

Electrification

To enable the path to net-zero technologies (e.g., electric heating) **power demand will significantly increase** which will require HEDNO to ensure the development of the grid to handle capacity and optimize balance between existing grid and new asset-based solutions

E-mobility

Emission free mobility will see a significant rise in order to decarbonize the transportation sector, requiring infrastructure, as well as systems to manage grid load

RES penetration

RES generation will increase due to phase out of conventional generation. Part of this distributed generation will have to be **connected to the Dx grid.** RES will also generate a set of **operational challenges** that will have to be overcome (e.g., need for flexibility, large power injections during peak hours)

HEDNO will need to **facilitate the development of demand side management as well as other flexibility products** (e.g., EV to grid) and to **coordinate with all stakeholders** (e.g., TSO) to **manage operational complexities**

Digital capabilities

To enable the above solutions and make the grid smart, **digital capabilities** and systems will have to be developed (e.g., smart meters, data management and analysis, digital twins)

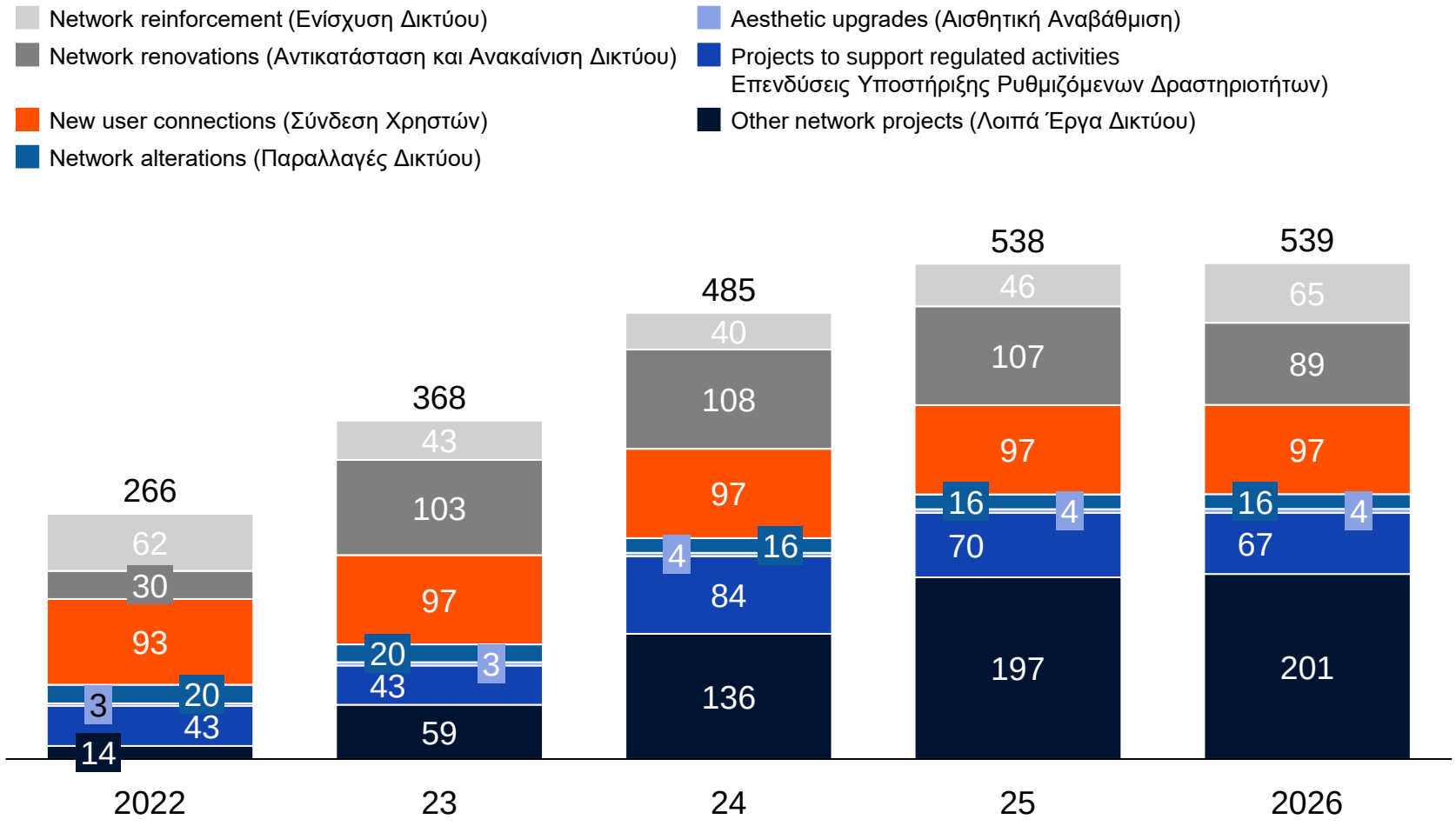
HEDNO will need to make the **necessary investments to make the grid "smart"** (e.g., smart meters) and **enhance digital capabilities** to enable all these services (e.g., data sharing, cyber security)

HEDNO has designed initiatives to enable these trends via its holistic transformation…

Source: HEDNO Business Plan

…and its aspirational investment plan for the next 4 years translates these initiatives into investments

National national development plan, EUR m



HEDNO's investment plan aims to **incorporate the necessary investments in order for HEDNO to succeed in its role**

It estimates a **total of EUR 1.9 billion investments in the period 2023-2026**, with a **large portion** targeted in energy transition projects, including the **installation of smart meters, the modernization of the grid and multiple digitalization initiatives**

Source: National Development Plan

To achieve these targets HEDNO will face many challenges that it will have to overcome

Macroeconomic

Current **macro-economic conditions** (e.g., war in Ukraine, energy crisis, potential economic crisis) generate high **volatility in power demand and price**, increase **uncertainty about the future development of the energy infrastructure** (e.g., mix of lignite in the energy mix) and about **consumer behavior**

Operational

HEDNO will face significant **operational challenges** in order to make sure that it creates the necessary infrastructure to **enable the energy transition in the most cost-effective way for the consumers.**

Regulatory

The **regulatory framework will need to evolve** in tandem with the energy transition for the country to successfully deliver on its goals. This would imply elements such as **taking into account required investments** or allowing the **evolution of the tariff** and the introduction of **demand side products**

Thank you for your attention

Sophia Politopoulou
Director of Regulatory Affairs dpt HENDO
Vice Chair Strategic Advisor Committee EU DSO entity
S.Politopoulou@deddie.gr
+30 6978000944

22 November 2022