Operational Challenges of the Transmission System in the Energy Transition



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Operational Challenges of the Transmission System in Energy Transition

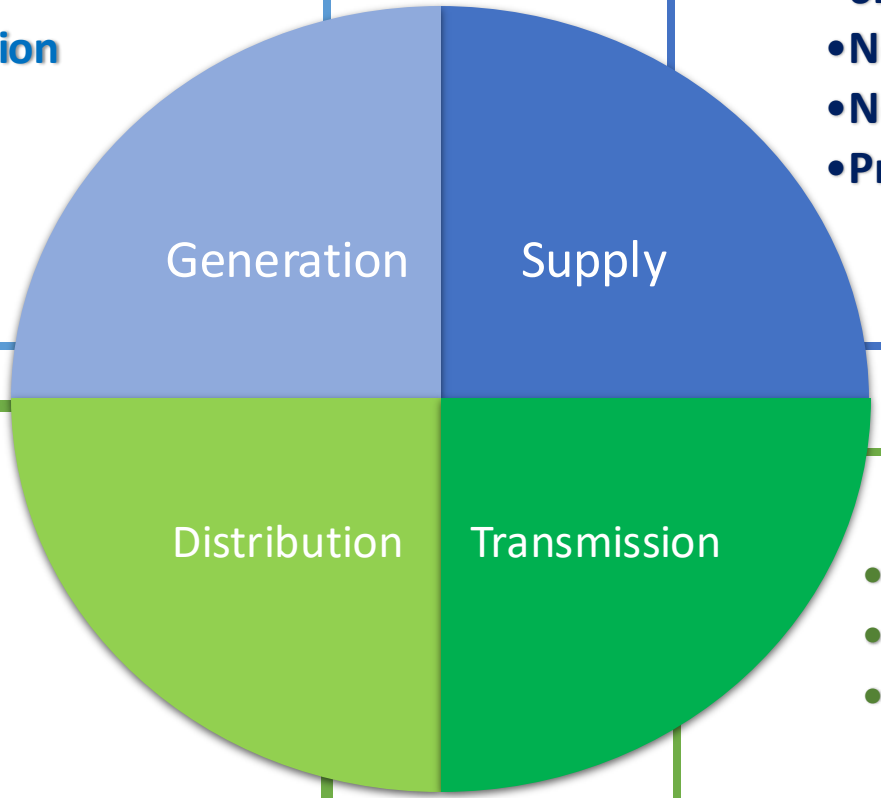
Topics

- Electricity Authority of Cyprus
- Energy Transition
- Challenges
- Strategic Plan
- Conclusions

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EAC at a glance

- 3 Power Generation Stations
- 1478MW Conventional Production
- Photovoltaic installed 20MW



- 615.000 Customers
- Net Billing
- Net metering
- Producers

- Medium Voltage
- 10.670 km
-
- Low Voltage
- 18.602 km
-
- 18.070 Distribution Transformers

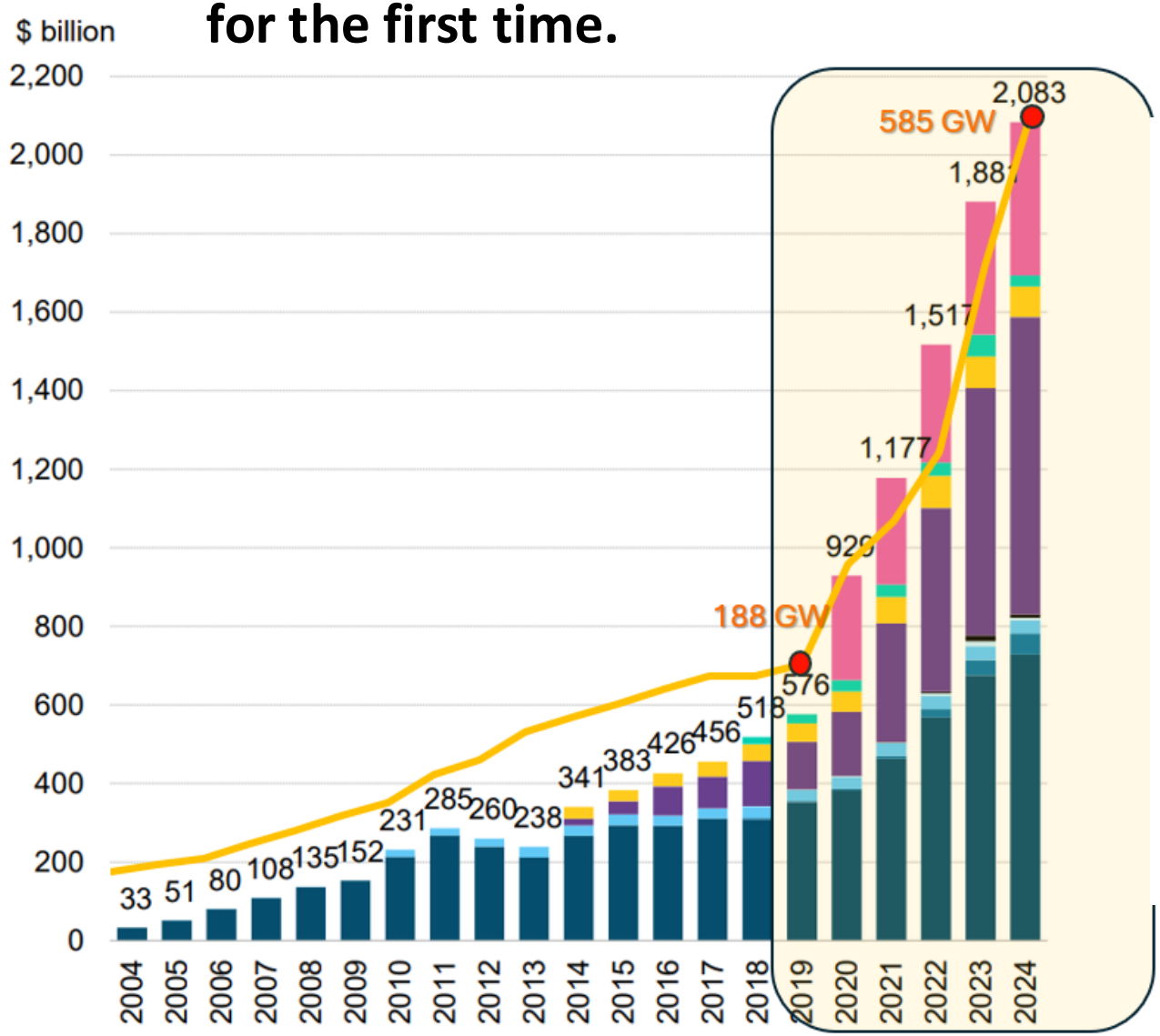
- 58 Transmission Substations
- 1.040 km O/H Lines
- 248 km U/G Cables

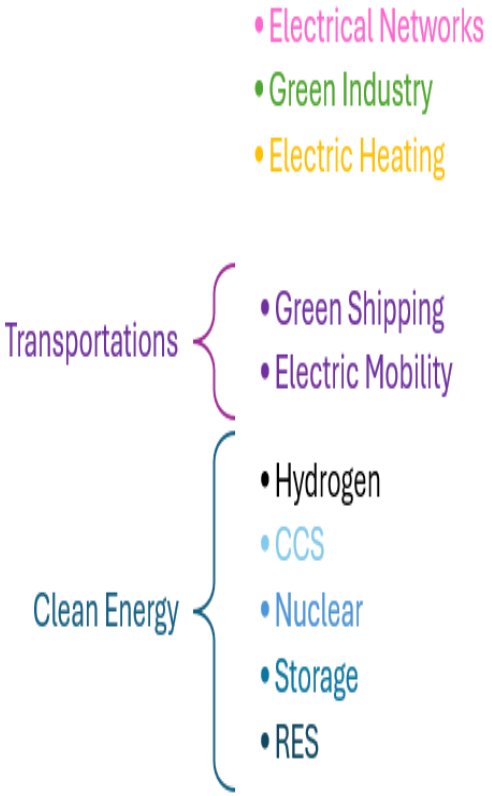
Energy Transition



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Global investment in the Energy Transition in 2024 exceeded $2 trillion dollars for the first time.





China is leading with $818 billion in 2024

EU, USA and UK invested less than China in 2024, which was not the case in 2023

Three sectors represented 90% of total investments:

- **Electric Mobility $757 billion**
- **Renewable Energy Sources (RES) $728 billion**
- **Electrical Networks $390 billion**

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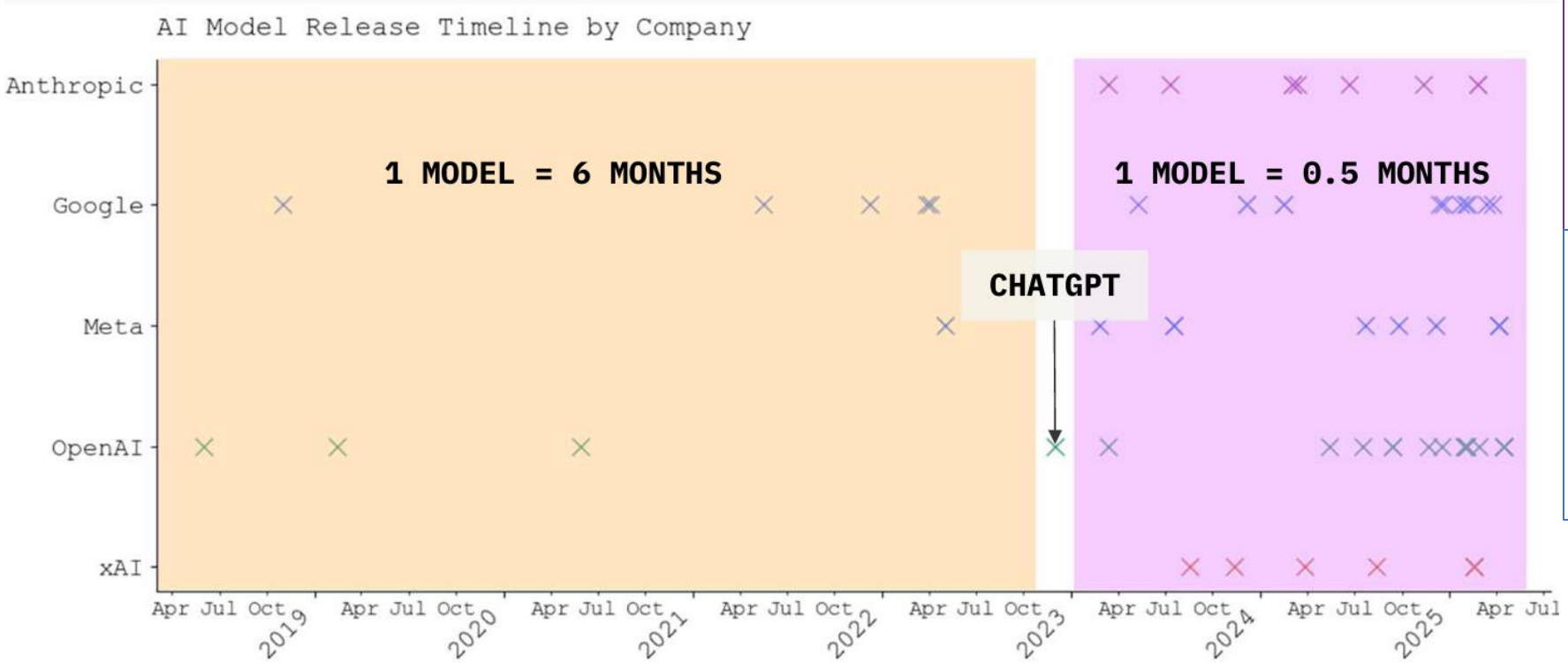
Study by Eurelectric - Grids4Speed - Forecast



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Artificial Intelligence in our lives

- Speed is not an option – it is strategy. Artificial intelligence models are updated twice a month, while this was done every six months before 2023.



«The disruption is not a passing storm -
it is the new climate in which we are called to lead»

«There are decades when nothing happens. And there are weeks where decades happen».



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Artificial Intelligence in our lives

In 2023, data centers consumed approximately 415 TWh worldwide.

20% of the energy was consumed by AI systems.

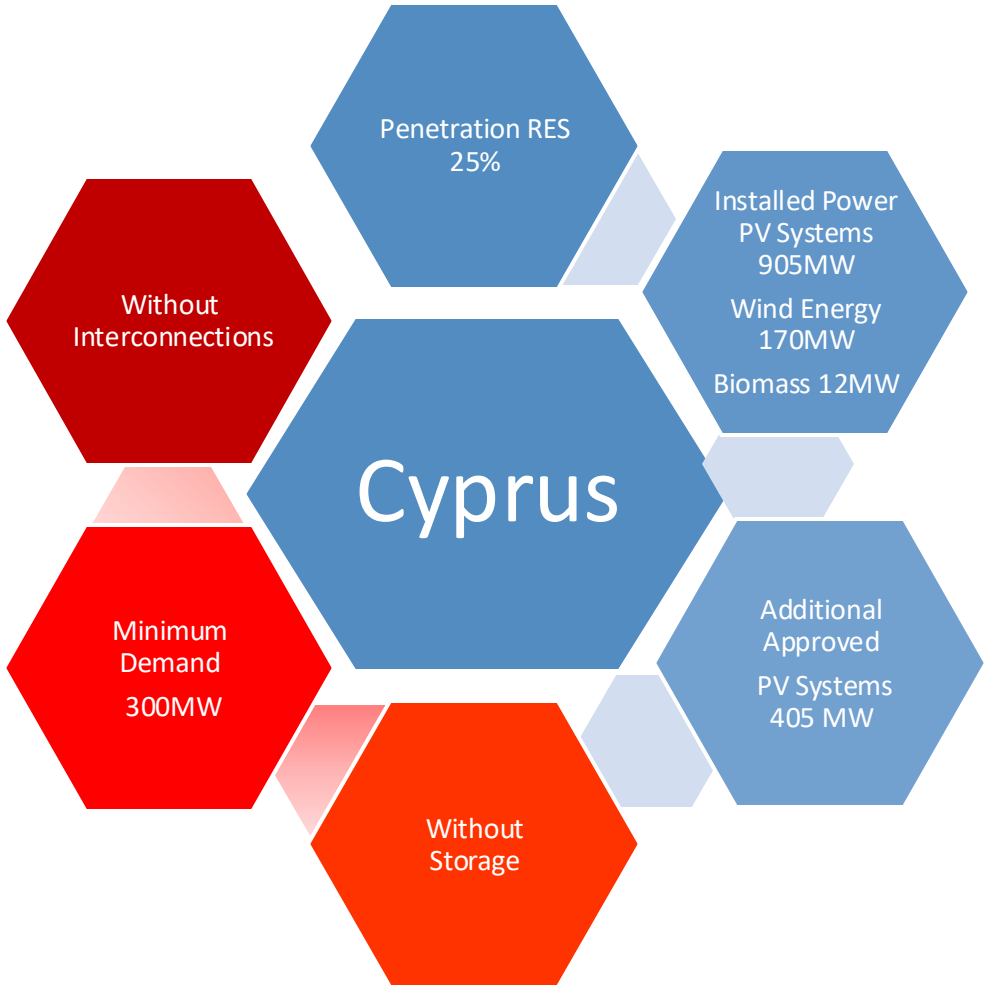
In 2025, AI is expected to reach 49% of total data center consumption, approximately 23 GW of power – exceeding the energy consumption of small countries.

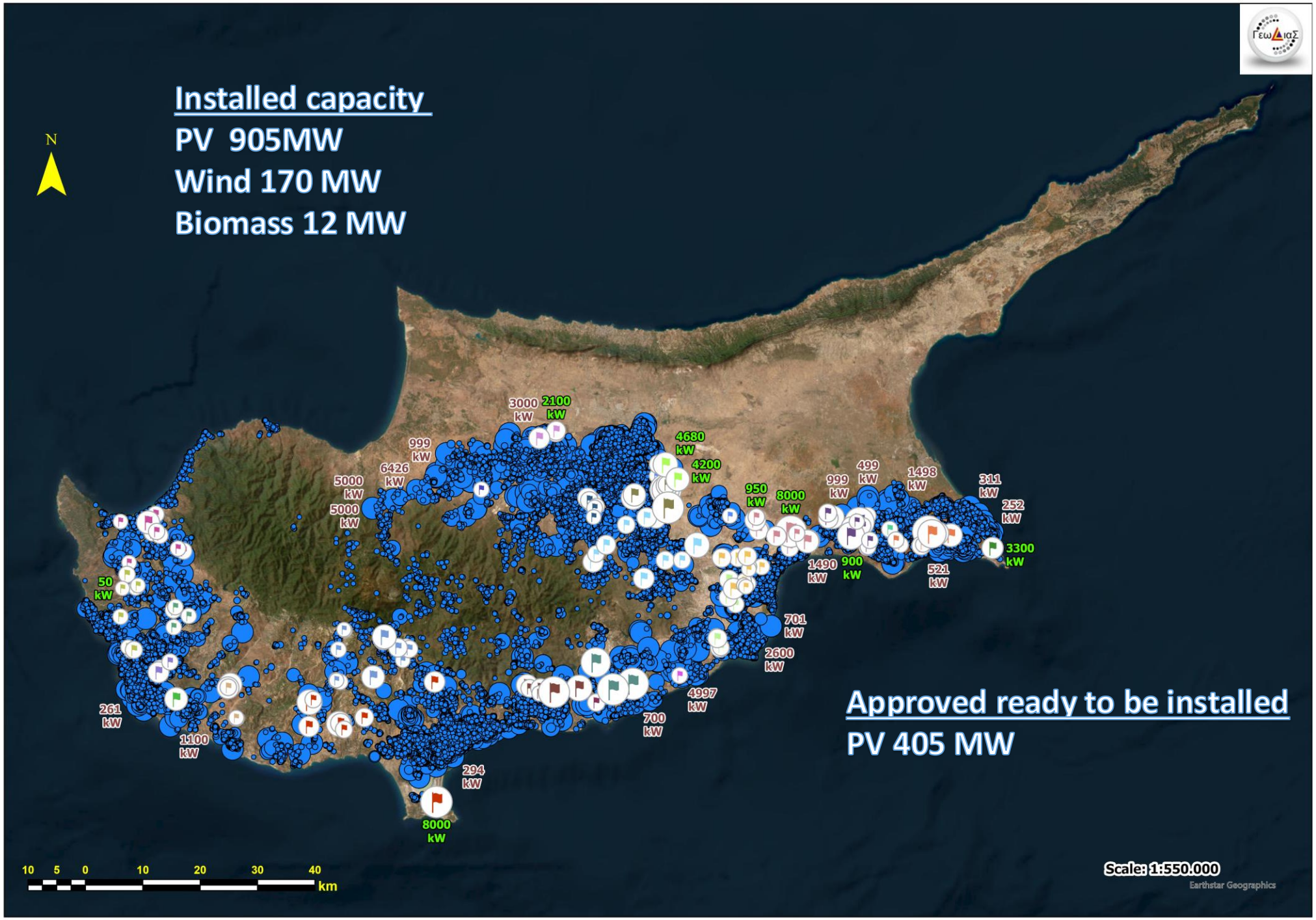
In Ireland, AI usage is expected to reach 32% of total energy demand until 2026

By 2030, the global energy demand from data centers is projected to more than double, reaching 945 TWh, with AI – as the primary force

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Energy Transition in Cyprus

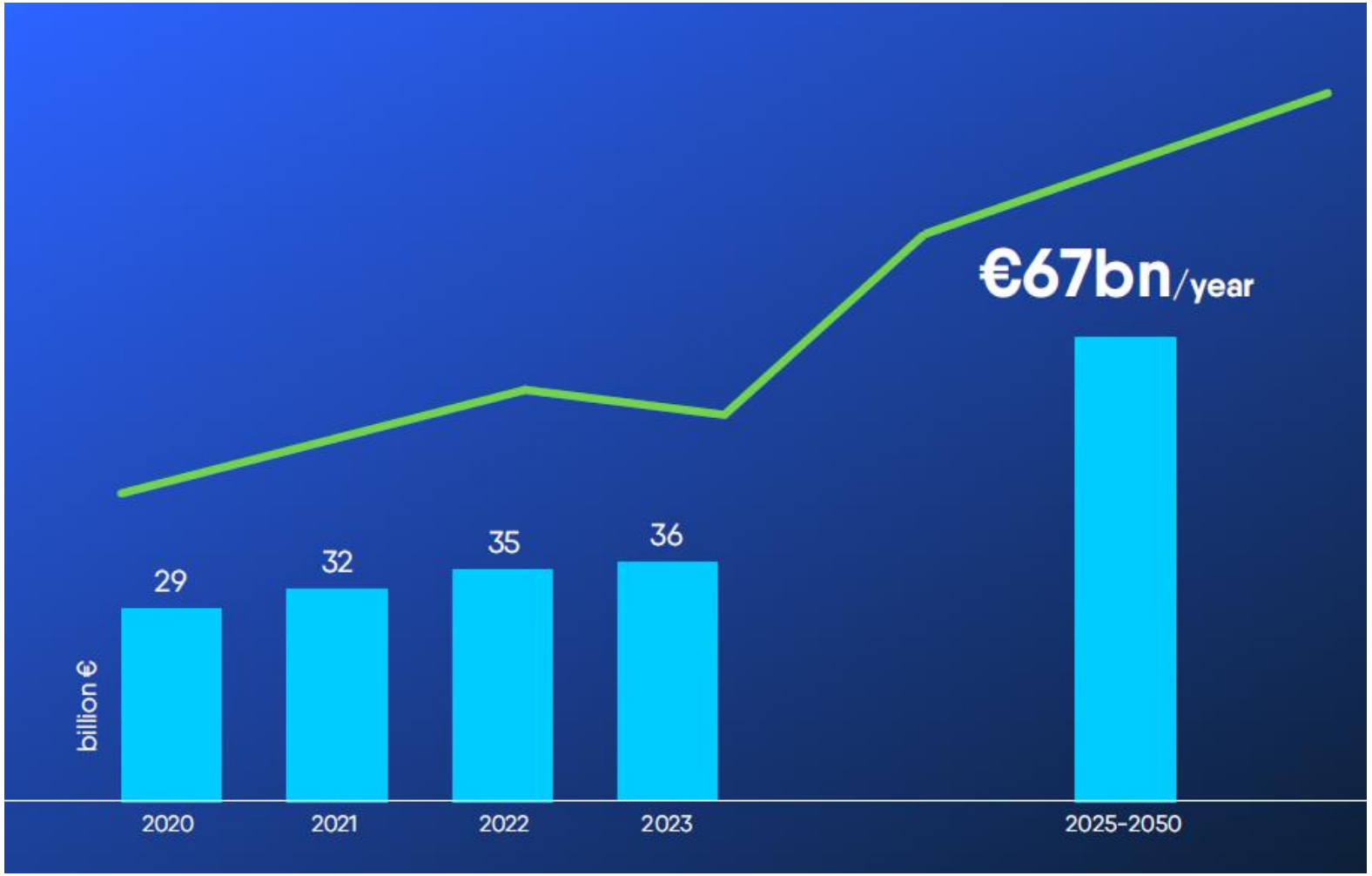



Installed capacity
PV 905MW
Wind 170 MW
Biomass 12 MW
N
3000 kW
2100 kW
999 kW
4680 kW
6426 kW
4200 kW
5000 kW
5000 kW
950 kW
8000 kW
999 kW
499 kW
1498 kW
311 kW
252 kW
3300 kW
1490 kW
900 kW
521 kW
50 kW
701 kW
2600 kW
4997 kW
700 kW
261 kW
1100 kW
294 kW
8000 kW
Approved ready to be installed
PV 405 MW
10 5 0 10 20 30 40
km
Scale: 1:550.000
Earthstar Geographics

Challenges



Investment in grids in Europe





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Governance, Planning, Flexibility, Adequacy, Investment

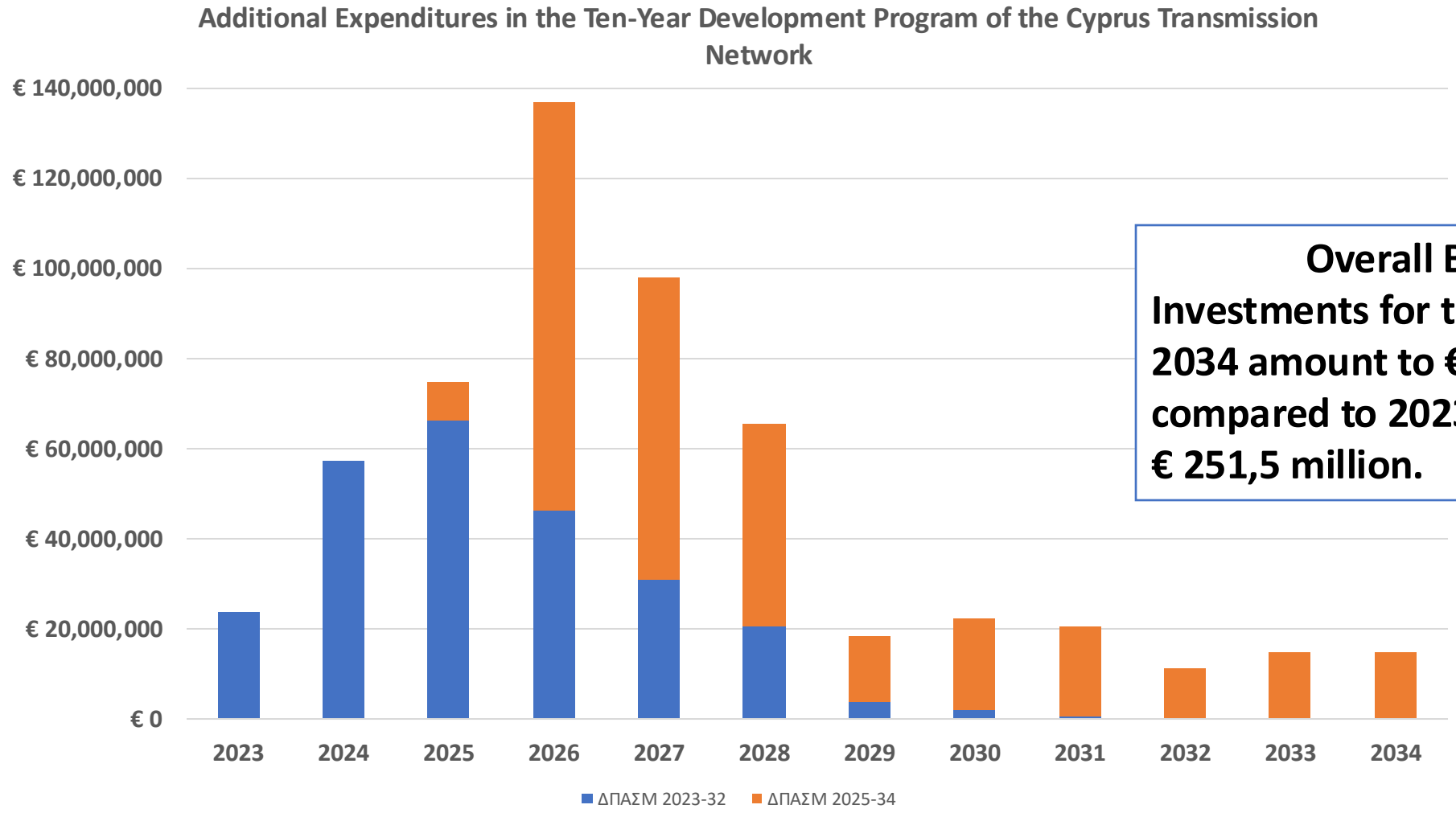
Black out of the Iberian Peninsula

The shift toward Renewable Energy Sources brings both opportunities and challenges in five sectors.

- Governance, Planning, Flexibility, Adequacy and Investment in Grids

Enhancing of stability, resilience and reliability

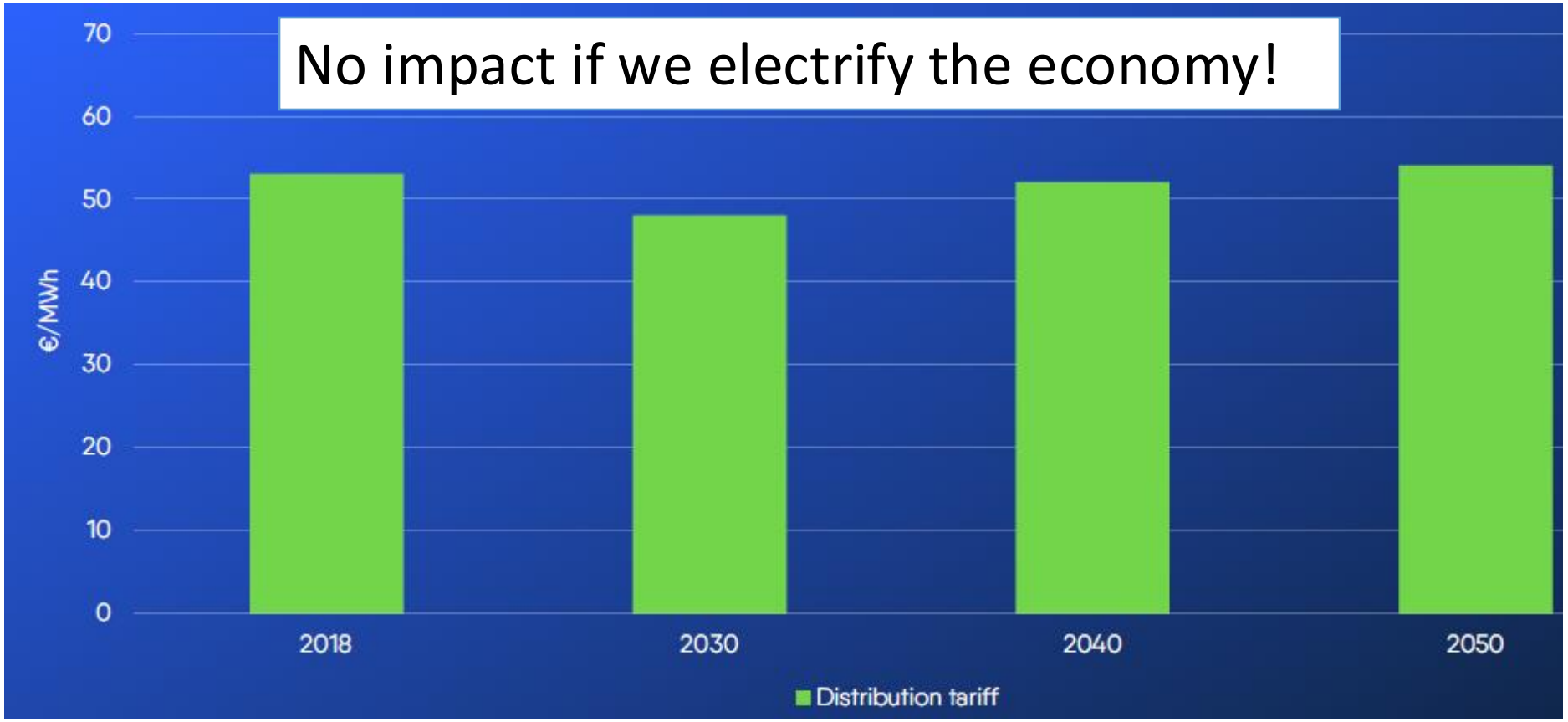
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Overall Budget:
Investments for the decade 2025 – 2034 amount to € 462,8 million compared to 2023-2032 which was € 251,5 million.

The overall budget of the network (T&D) for the next decade is estimated at €1 billion!

Impact on network prices



Long list of actions

- Regulation
- Permits
- Equipment Industry
- Specialties

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Cyprus Challenges

- High electricity prices
- Frequency and voltage issues
- Renewable Energy Source (RES) outages

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EAC Challenges

- Increased competition
- Limited ability of integrating RES
- Enormous demand for new projects

Strategic Plan



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Strategic Plan – Distribution



Wide installation of smart meter infrastructure



Upgrades from 11kV to 22kV



Network modernization



Expansion of the fiber optic network

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Strategic Plan – Transmission



Development & Upgrading of Transmission Substations



Transmission Lines Capacity Increase



Installation of Large-Scale Energy Storage Systems

Conclusion

EAC is committed to a series of actions:

- Cost-effective and sustainable energy transition for our country
- Modern, efficient, smart, and digital electricity system
- Our network is a platform that connects producers, suppliers, consumers, producer-consumers and energy communities
- Supporting the advancement of electric mobility
- Addressing the technical challenges that arise throughout this procedure


Thank you very much!!