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AI & DIGITALISATION DRIVING THE INTELLIGENCE OF ENERGY GRIDS FOR IMPROVED ORGANISATIONAL EFFICIENCIES

Demetris Skourides

Chief Scientist of the Republic of Cyprus

Chairman, National AI Task Force

2025 EUROPEAN PVPMC WORKSHOP

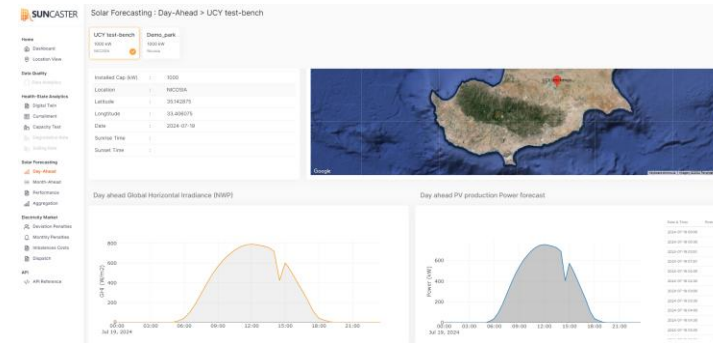
Artificial Intelligence in the Green Energy Transition

AI-driven R&I intelligent, efficient and sustainable energy solutions

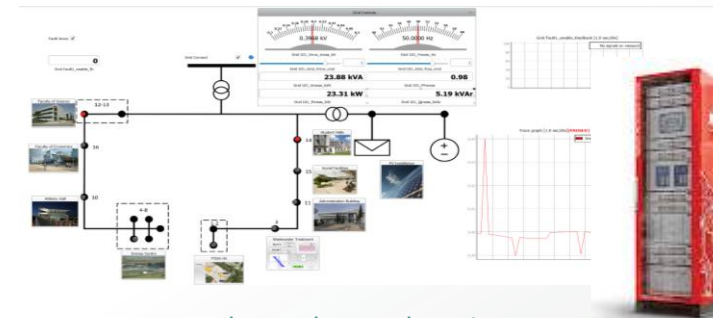
- 🎯 Digital twin models for renewables
- 🎯 Smart energy management systems
- 🎯 Forecasting generation/consumption
- 🎯 Predictive O&M of energy-field assets
- 🎯 Fault and performance loss detection
- 🎯 Energy efficiency optimization
- 🎯 Energy conservation profiling
- 🎯 Monitoring carbon footprint solutions
- 🎯 Big data analytics of energy streams
- 🎯 Testing AI-based code and platforms

AI-field education and training

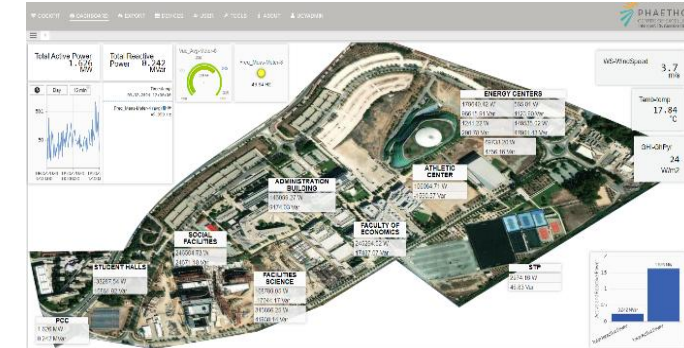
- 🎯 Targeted energy training courses on the:
- 🎯 Digitalization of the energy sector
- 🎯 Usage of AI across the energy sectors



AI-based energy asset supervision solutions



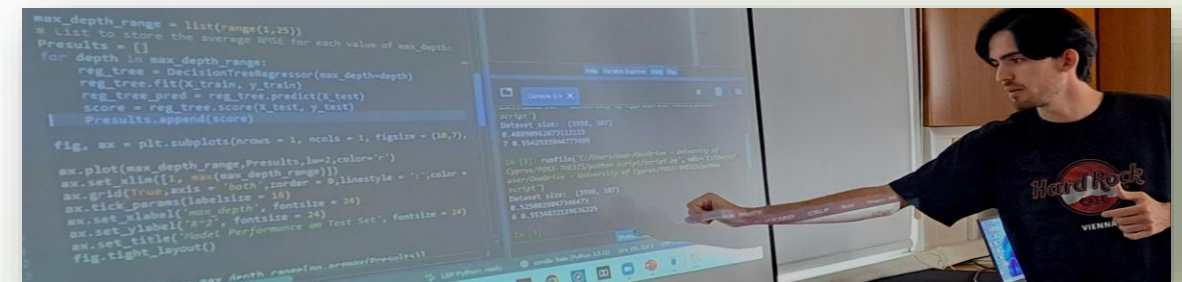
Accelerated AI tool testing



Energy management systems



Living Lab - Smart energy microgrid



AI-driven Smart Energy Campus



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Smart Energy System at UCY to tackle energy issues of the campus to optimize self-sufficiency from renewable sources and utilize energy efficiently.

Funding – **€700,000**

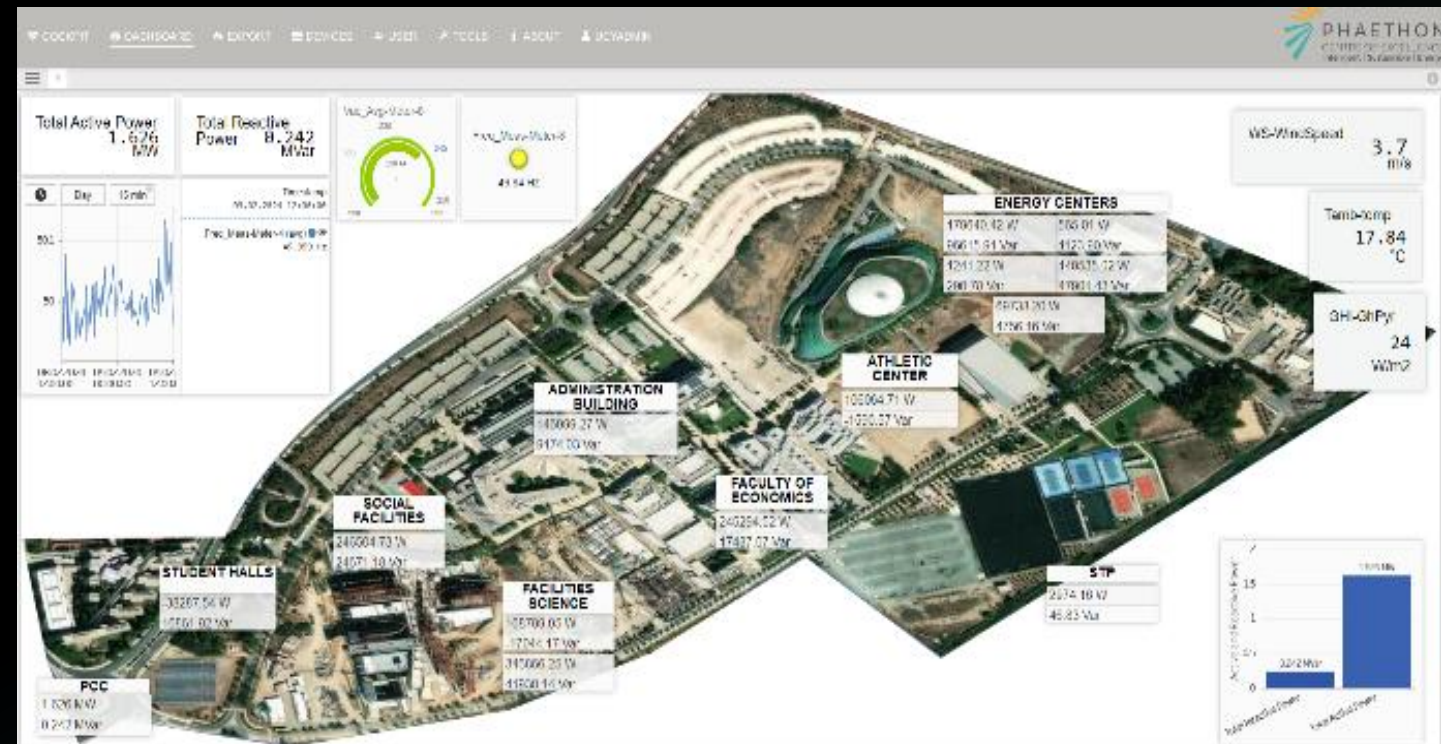
Cohesion Policy Programme "THALIA
2021-2027"

Consumption

- 15.6 GWh/yr (€5.13 mln/yr)
- 918,000 L of heating oil (€1 mln/yr)

Production

- Photovoltaic system (10 MWp)
- Battery 5 MW | 5 MWh



Living Lab for Smart Energy Systems

Reliable forecasting through Artificial Intelligence



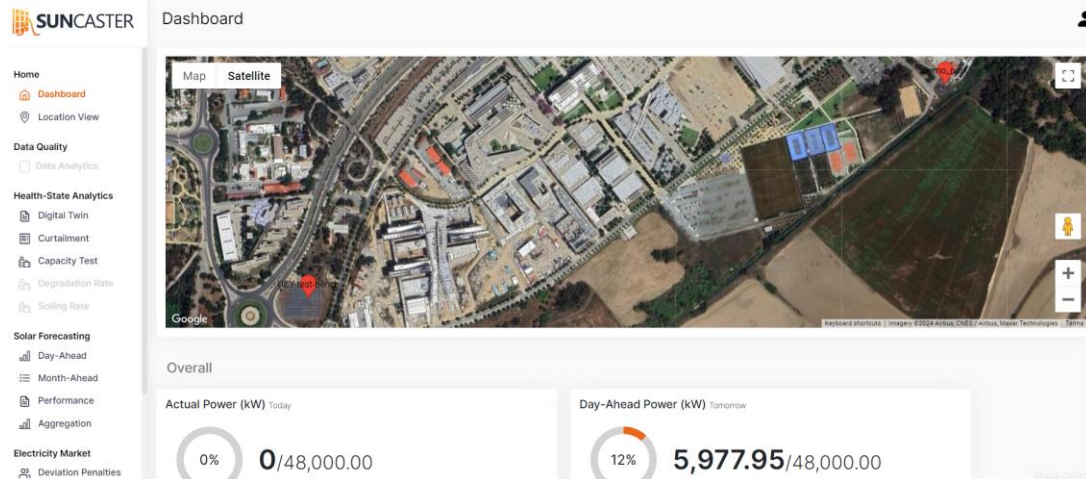
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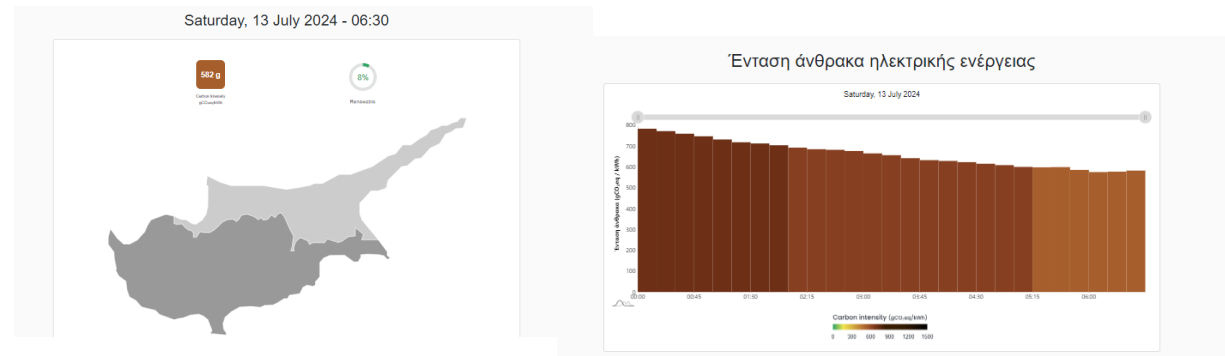
Innovative tools based on machine learning to drive the energy transition of Cyprus.

- 🕒 PV production forecasting and asset management tool (<https://suncaster.smartgridtoolset.com/>)
- 🕒 Load consumption forecasting tool (<https://loadcaster.smartgridtoolset.com/>)



 **SUNCASTER**

 **LOADCASTER**



Growing Diversification of the Economy



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ENERGYTECH



HEALTHTECH



SHIPTECH
& MARITIME



TECHNOLOGY
& INFRA



Education

€1415 million
5.80%

Shipping

€929 million
3.80%

2022

**Financial and
Insurance Services**

€2406 million
9.80%

**Information and
Communications
Technology**

€3400 million
13.90%

Education

€1451 million
5.50%

Shipping

€942 million
3.60%

2023

**Financial and
Insurance Services**

€2740 million
10.50%

**Information and
Communications
Technology**

€4000 million
15.30%

Percentage Change

18%

Information and
Communications
Technology

14%

Financial and
Insurance
Services:

3%

Education

1%

Shipping

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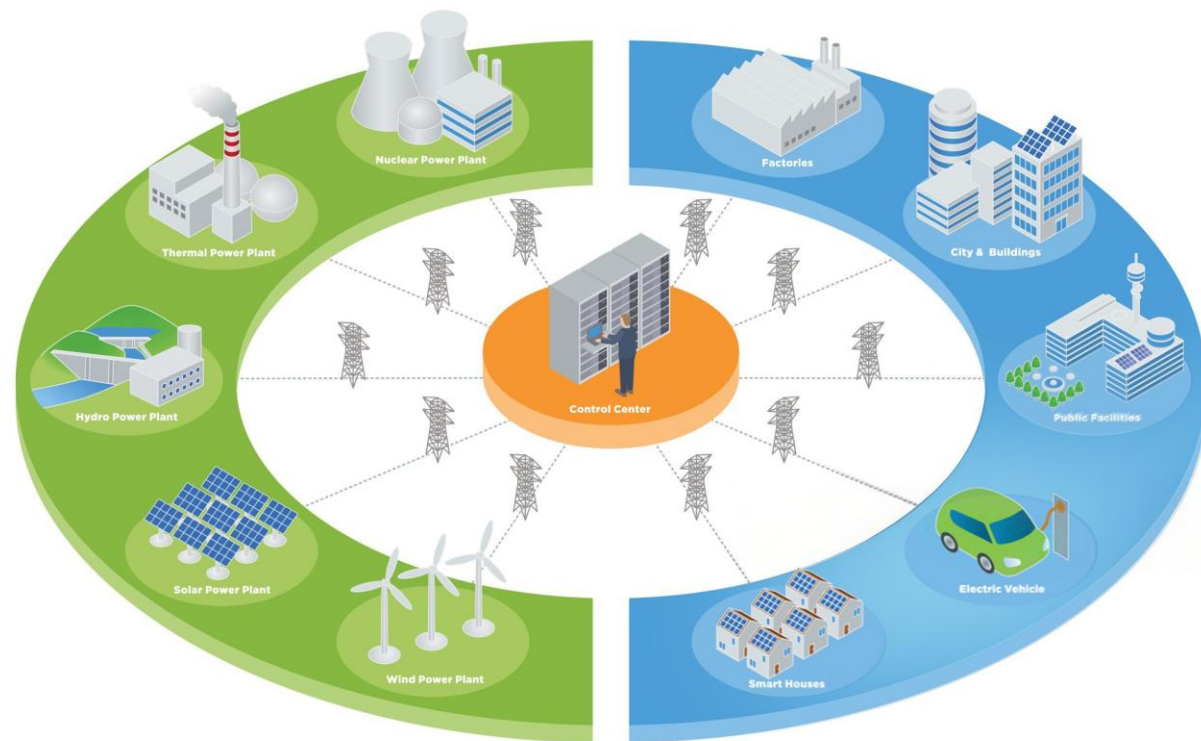
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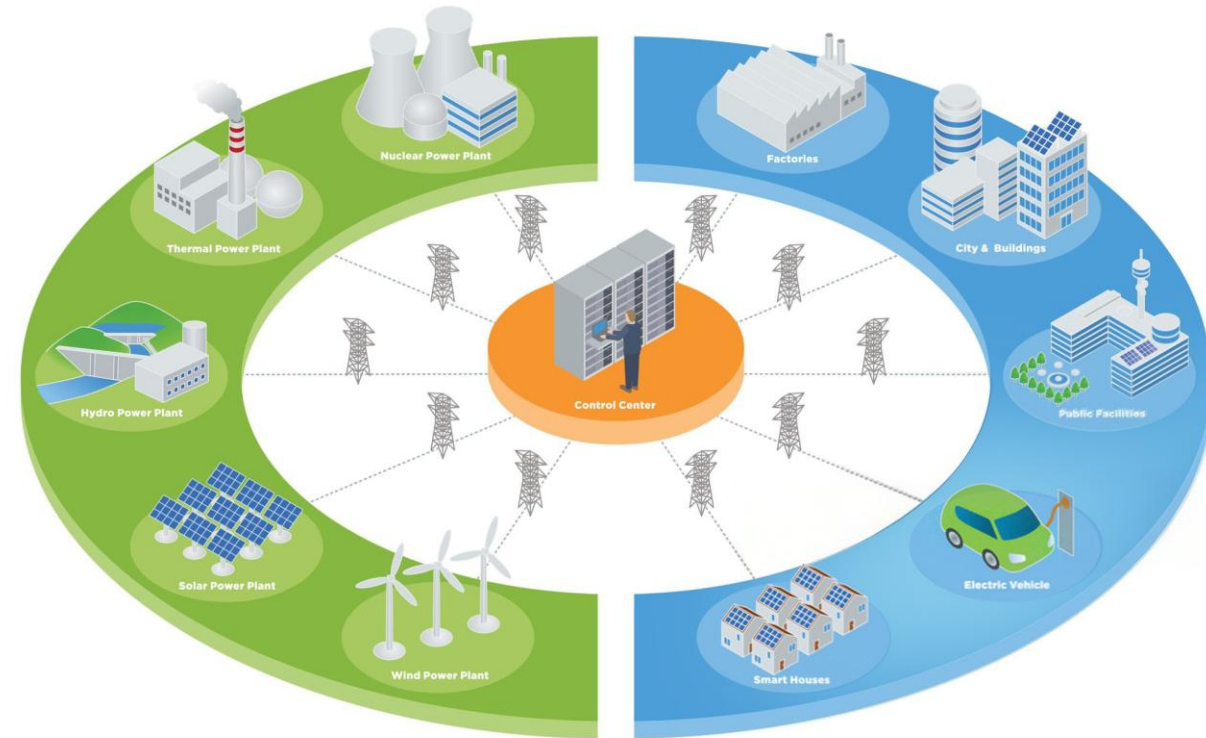
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