



Greek approach on investing in smart grids and good practices as means to achieve it.

PANTERA workshop

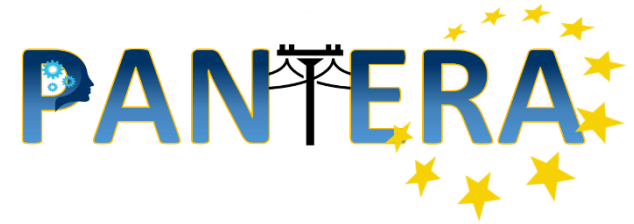
Sofia

2019-07-02

Tasos Tsitsanis, Suite5



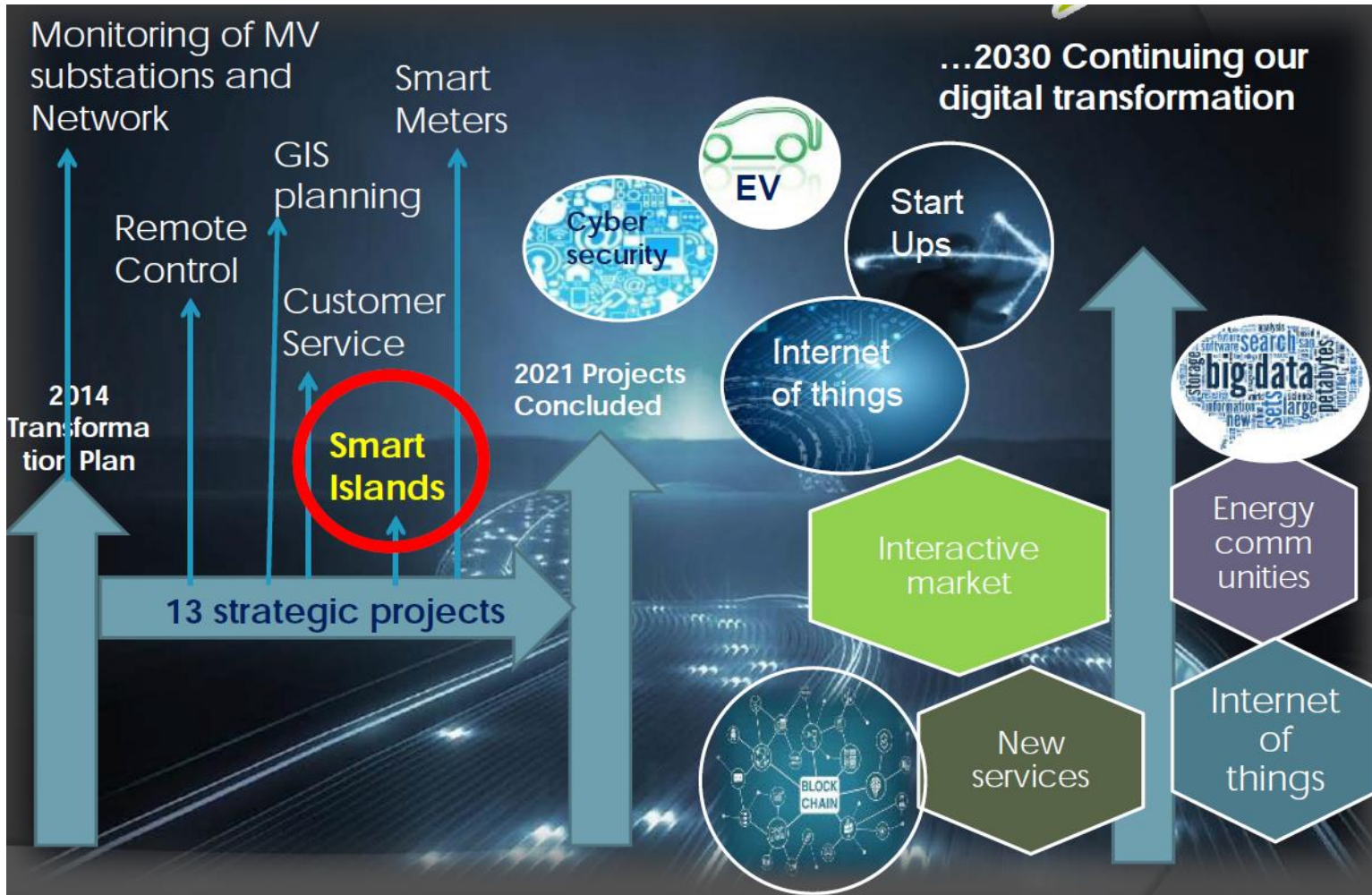
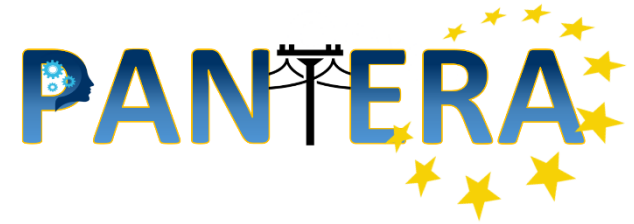
Main facts for the Greek Electricity System



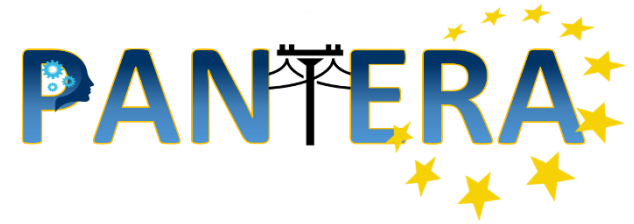
- > 237.000 km network length
- > 7.400.000 connections
- 1 TSO → IPTO
- 1 DSO → HEDNO
- >15 Independent Energy Suppliers
- 60 islands → 39 interconnected, 21 autonomous
- ~30% RES penetration



Greek roadmap towards the realization of the Smart Grid



Greek roadmap towards the realization of the Smart Grid

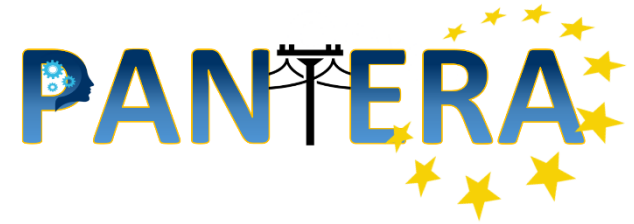


Concluded Projects

- Integrated System for Digitalization and Data Management → Monitoring of MV substations and network and remote control of key assets
- Network Planning Upgrade
- Electronic Customer Service System
- Geographic Information System (GIS)



Greek roadmap towards the realization of the Smart Grid



On-going and future projects

- Smart Meter Penetration → 15.000 in MV customers, 60.000 in large LV customers
- EV Charging Points Installation → Currently a pilot project with ~45 EV charging points to be increased by 100 in the next year with the aim to add 1.000 – 1.500 until 2022
- Smart islands projects: Kythnos, Ikaria, Tilos, Agios Efstratios, Symi, Megisti, Astipalea
- Active Network Management with increasing shares of RES and Demand Response: NOBEL GRID, WISE GRID
- TSO-DSO collaboration projects: COORDINET, CROSSBOW
- Microgrids and Local Energy Communities: COMPILE, X-FLEX
- Data Sharing among energy market actors and blockchain: to be announced soon
- Support to Start-ups for the development of novel applications and solutions for the Smart Grid → SwitchOn Innovation Lab powered by HEDNO
 - Big Data Analytics – Blockchain – Energy Communities – Image processing for network monitoring



Indicative Projects



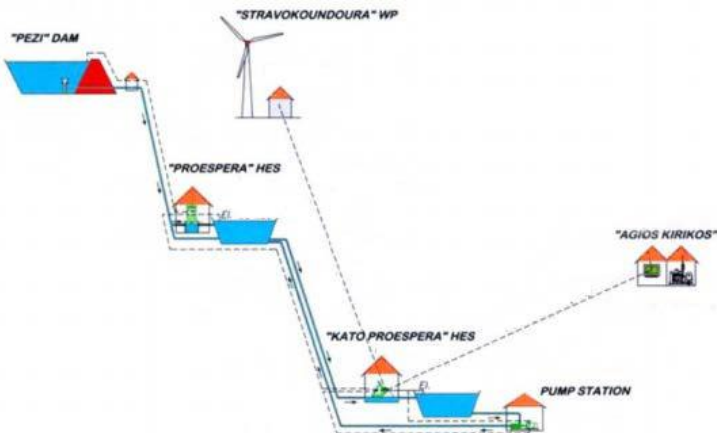
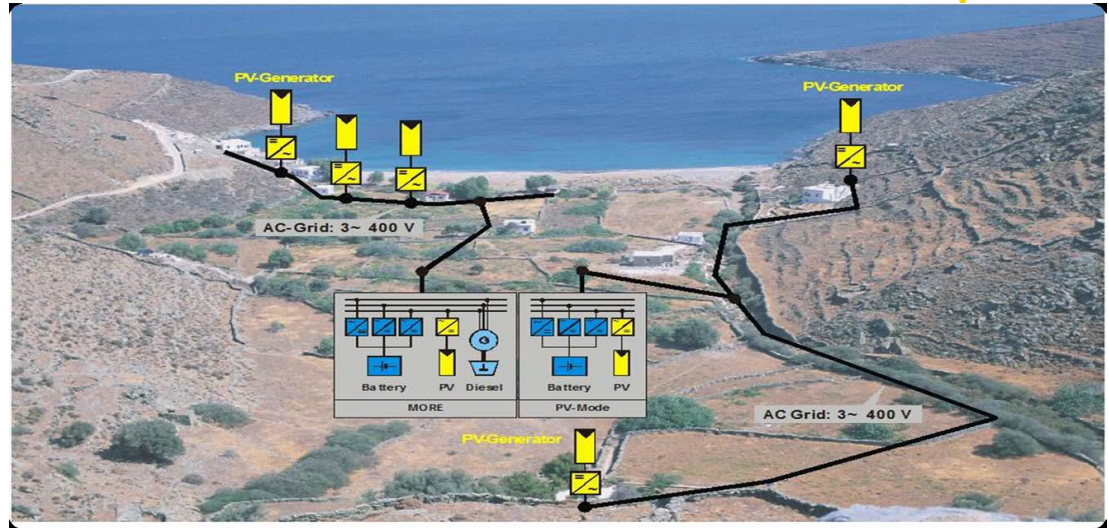
- Low cost smart meter development and deployment for LV customers
 - Smart Active (rule-based) Network Management in presence of high shares of renewables (Congestion Management, Peak Load Management)
 - Implicit and Explicit Demand Response
 - EVs and Storage as active network assets and flexibility instruments
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- Common Operational Planning of Power Grids between DSOs and TSOs
 - Flexibility-based network management
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- Enhanced Network Asset Management and Planning
 - Retailer portfolio analytics and elasticity (price-based flexibility) estimation for the provision of services to network operators
 - Flexibility segmentation, classification and clustering towards VPP configuration for demand response
 - Local Flexibility Sharing for Self-Consumption Optimization at Local Community Level
 - Big Data Analytics and Data Sharing Platforms for increasing transparency and data exchange between market actors
 - Blockchain-enabled applications for energy trading and transactions monitoring and settlement



Indicative Projects

KYTHNOS Microgrid

12 houses with PVs and Batteries (52 kWh), 9 kVA Diesel (only back-up), flexible loads (1-2 kW irrigation pumps) and Intelligent Load Controllers



IKARIA Hybrid Pump-Hydro Station

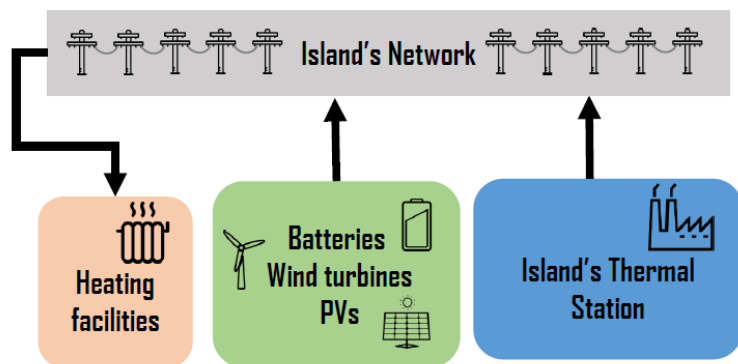
Combination of HydroElectric power and Wind power guaranteeing 2,55MW, when the 5-year Average Peak Demand of Ikaria is 7,3MW.

Indicative Projects



TILOS Project

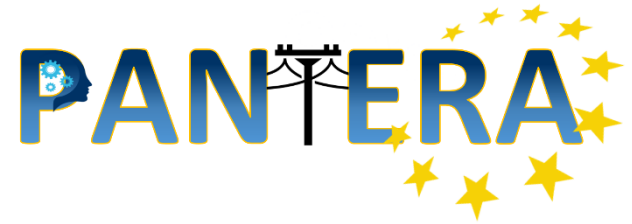
- Micro grid energy management with high penetration of RES and storage
- Maximization of RES penetration
- Grid stability
- Ancillary services to the main grid of Kos



AGIOS EFSTRATIOS Green Island Project

- Development of a Hybrid Power plant (wind, PV, Batteries)
- Development of a RES powered District Heating System
- Target for 85% coverage of the island's energy needs by RES

Issued to be addressed for accelerating the transition



Infrastructure

- Increased Smart Meter Roll-out
- EV charging points roll-out
- Centralized and de-centralized storage units
- Investments in ICT, Big Data Analytics, Distributed Ledger Technologies for increased network digitization, observability, insights and controllability.

Legislation & Market

- Adjustment of the national legal framework for Storage and Batteries
- Clear framework for independent RES and demand side aggregators
- On-time opening of the Greek Energy Stock Exchange
- More favourable conditions for local energy communities establishment and remuneration of demand

Business

- Enhanced collaboration between market actors for the definition of new business models and the provision of novel energy services
- Consumer-centric operational models and services, facilitating empowerment and participation in energy markets
- Invest in R&I as a means to increase know-how and attract back to Greece their lost human capital (brain-drain) due to the recession





THANK YOU FOR YOUR ATTENTION!

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