The Energy Transition of the Greek Non-Interconnected Islands

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Greece – The Energy Future

1. The energy sector is one of the most important pillars in terms of policy development and implementation in the context of Greece's growth strategy for the next decade.

2. Breakthroughs are expected to occur in the next decade in the field of power supply in Greece, as the share of RES in energy generation is expected to increase significantly and gradually replace the use of fossil fuels

Specific transition policies will have to be developed.

4. However, the anticipated reduction in the mining of lignite and its use for power generation purposes will have a direct and indirect impact on growth and employment in lignite-producing areas.

3. The policies to be adopted aim at integrating RES in the electricity market in a competitive manner.

Transport & Energy Efficiency

Transport

• Use of vehicles powered by alternative fuels and electricity
• Sharp drop in the unit consumption of energy per type of vehicle
• Use of second-generation biofuels,
• Complete electrification of railway infrastructure
• Increase in the share of track-based modes of transport in the overall transport work

<u>will, by the end of the next decade,</u>

Totally transform the technological structure and fuel mix used in the transport sector, thus impacting the national economy as a whole.

Energy Efficiency

Improving energy efficiency in all fields of consumption is the biggest endeavour and challenge for the public policies to be implemented in the next decade.

• Absolute priority that should cover the entire scope and mix of policies and measures to be adopted

• Energy savings achieved through improved energy efficiency have a direct impact on how energy is consumed, on the technologies used and on the coverage of consumer energy needs

• Also making a substantial contribution towards improving the competitiveness of all industrial activities.

National Energy and Climate Plan (NECP)

We modernize and plan the energy future for Greece aiming to reduce high energy costs, safeguard energy security, make more use of renewable energy and develop innovative energy systems

The Ministry of Environment and Energy completed and submitted to the European Commission an integrated long term strategy for the energy sector for 2030, supporting the ambitious EU targets from the beginning.

The new regulatory framework for the EU that we agreed includes:

- **an energy efficiency target of 32.5% for 2030, with an upwards revision clause by 2023**
- **a target of 32% for Renewable Energy Sources (RES) penetration in the final energy consumption**
- **CO2 emissions reduction of 40% until 2030**

In order for those targets to be met, huge investments in RES and infrastructure are needed, reaching 35bil Euros, while almost 9bil. Euros refer to infrastructure in networks.

Renewable penetration framework

Greece is proceeding firmly towards achieving its goals with regard to renewable penetration in the energy mix. To achieve that goal, an integrated reform agenda has been adopted:

RES support scheme	• Reformed RES support scheme by replacing guaranteed feed-in tariffs with competitive tendering process, in order to harvest the great potential of the development of RES capacity in Greece. RES tendering processes for the period 2018-2020 that will cover 2,6 GigaWatt of capacity for Wind and Solar.
Spatial Planning Framework	• Moving towards reforming and modernizing the current Spatial Planning Framework for the Renewables, towards the direction of implementing the European Best Practices, achieving the targets but also respecting the environment
Energy Communities	•We have legislated the innovative framework of the Energy Communities that will allow for the active participation of citizens, municipalities, communities and other stakeholders that have traditionally been inactive from the energy transition process and will allow them to meet their energy needs by their own means. It is expected that energy communities will spur innovation, creation of jobs at a local level and thus will disperse the benefits in the local society, increasing the local acceptance of the Renewables.
Payments to the RES producers	•Payments to the RES producers have been normalized compared to the past, signaling a reliable and trustworthy environment in the renewable energy market for investors. The deficits have been turned into surpluses as of 2017 and onwards, with specific law amendments ensuring the viability of the Special RES Account. This can be reflected by the boom in the investments currently occurring in Wind and Photovoltaics.
Next Step	•Simplification of the licencing procedures, in order to align them with the current tendering procedures, by creating a faster and less bureaucratic process which will further enhance investments

Those efforts indicate that Greece now offers a robust regulatory framework for RES following the stabilization of the economic sphere in general, which can guarantee the stability that is needed for attracting domestic and foreign investments in the field.

Pending issue is the pricing for the Hybrid Power Stations.

Opportunities and challenges for the Greek islands

The transition of Greek islands towards clean, renewable and affordable energy for citizens, while creating jobs and added value for the local economies.

The Greek islands present specific opportunities and challenges that need to be addressed

The development of interconnections plays a key role in the energy transition.

We are strongly promoting the Electrical Interconnection of the Greek Islands with the main land: very important investment projects with secured financing.

Characteristics

Seasonal high energy demand	•is challenging islands' infrastructure •is also putting pressure on their natural resources
Due to the islands' isolated nature, they are ideal test-beds in order to install, test and implement	•new innovative technologies, •procedures and services
They can serve as living labs for innovation with high added value	•platforms for pilot and operational initiatives on clean energy transition with a holistic approach •can serve as showcases at international level and models for the future sustainable operation of larger interconnected systems

The Case for the Non-Interconnected Islands

ΥΠΟΥΡΓΕΙΟ ΠΕΡΙΒΑΛΛΟΝΤΟΣ & ΕΝΕΡΓΕΙΑΣ

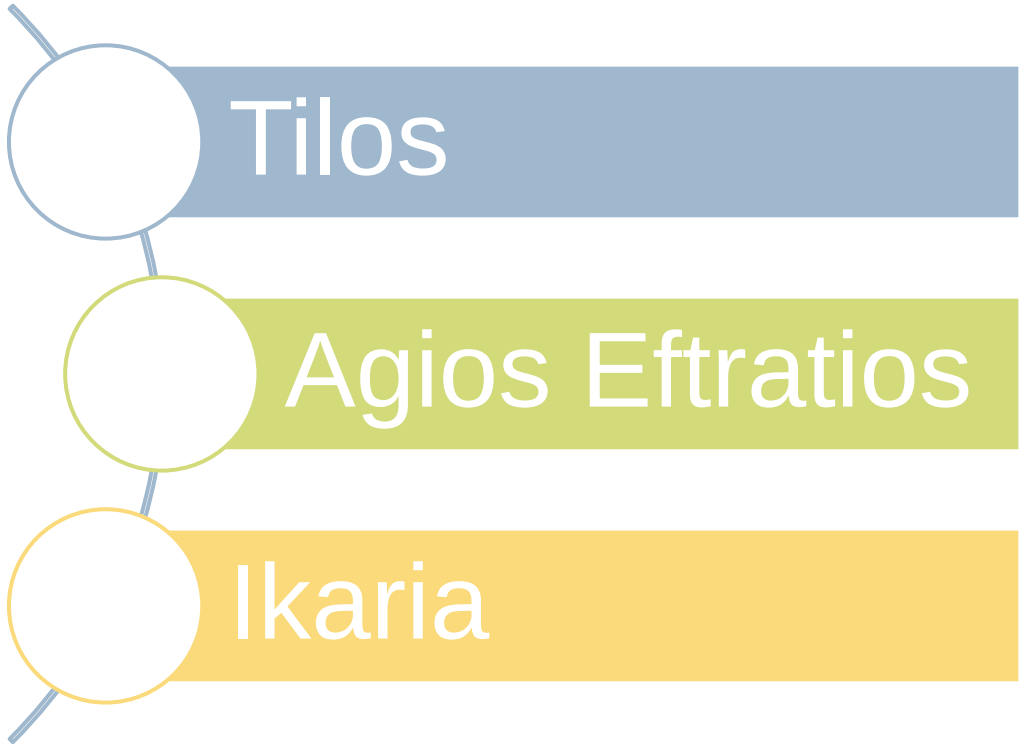
Phase A

***Previous frameworks that have already been addressed*:**

• Tilos, a small island in the Dodecanese, is a pioneering nature reserve. Tilos is set to be a front-runner in the Mediterranean as it will be run mostly on wind and solar power and a battery.

• Another example is Ikaria where the hybrid power station (pump storage) has been almost fully constructed and

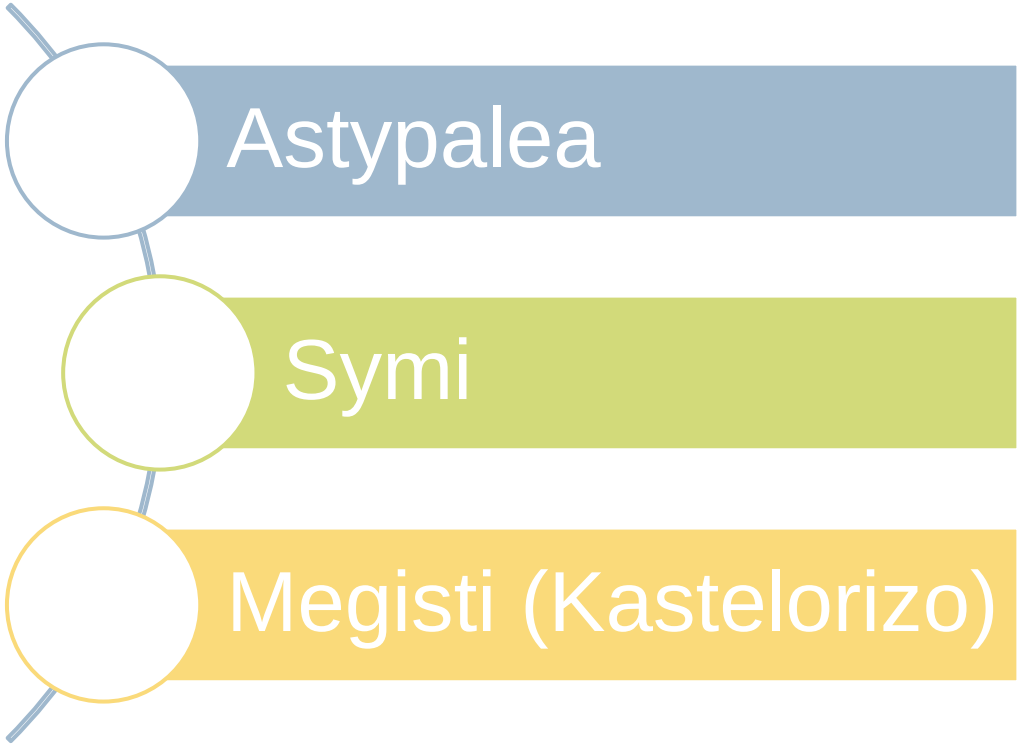
• Agios Efstratios (The Green Island initiative), a project that the Center for Renewable Energy (CRES) is managing and refers to 85% RES penetration. The latter will also be realized through a tender procedure.



"Smart Islands" Pilot Projects

Phase B

- Law 4495/2017 prescribes the implementation of Smart Islands Pilot Projects in selected Greek islands.
- The projects will be realized by investors via **tenders** held by the Regulatory Authority for Energy.
- Each project will consist of new **RES units** in combination with **storage** controlled by a **smart management system**.
- The target of the Smart Islands pilot projects is to increase RES penetration beyond 60%, while ensuring the reliability and security of the power systems in a cost efficient way.
- New developments - Provisions



The Energy Islands Framework (CE4EUI)

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Phase C

- There are more than 2200 inhabited islands in the EU.
- Despite having access to renewable sources of energy, such as wind, solar and wave energy, many of them depend on expensive fossil fuel imports for their energy supply.
- Based on the aforementioned, an initiative that provides a long term framework to help islands generate their own sustainable, low-cost energy, will result in:
  - Reduced energy costs and greatly increased production of renewable energy and the construction of energy storage facilities and demand response systems, using the latest technologies
  - Increased energy security for islands, which will be less reliant on imports
  - Improved air quality, lower greenhouse gas emissions, and less impact on islands' natural environments
  - Creation of new jobs and business opportunities, boosting islands' economic self-sufficiency.

Energy Islands Initiative – Clean Energy for EU Islands /General Principles

ΥΠΟΥΡΓΕΙΟ ΠΕΡΙΒΑΛΛΟΝΤΟΣ & ΕΝΕΡΓΕΙΑΣ

General Principles

Phase C

- **High RES penetration (>50 – 60% in all cases)**
- **Operational rather than Exhibition projects**
- **Solutions taking into account existing problems in the islands**
- **Innovation | Growth potential | Know-how & Value Adding**
- **Electrification of Transportation included – Electric Vehicles & Ships**
- **Interconnections taken into account**
- **Islands as real case Test-beds for innovative solutions with a global footprint**
- **Energy Communities, Local Authorities, SMEs and citizens as part of the Energy Transition (local acceptance)**

Technological Solutions

- Taking into account the planning and timeframe of island electric system interconnections, the “Clean Energy for EU Islands project” consists of applying new technologies focusing on selected under specified criteria non-interconnected islands, not in the form of pilot projects but basically on an operational and actual problem-solving basis. This means that Greece is primarily focusing on solutions in the forefront of energy developments but mature enough, i.e. available in the market, such as:
  - **Storage applications (mainly batteries)**
  - **Island Energy control systems**
  - **Demand-side management (hotels, public building) by means of smart metering and controllers**
  - **Electrification of transportation, including electrified ships.**
  - **Upgrade of infrastructure between islands (medium-voltage) – Island Operator**
  - **New renewable energy applications, e.g. floating wind turbines.**
  - **Some of the applications (like electric ships) can be foreseen also in (soon-to-be) interconnected islands.**
  - **Other criteria are the geographical position (e.g. insularity), the immigration flows, existing network issues etc.**

ΥΠΟΥΡΓΕΙΟ ΠΕΡΙΒΑΛΛΟΝΤΟΣ & ΕΝΕΡΓΕΙΑΣ

Thank you for your attention!